

Improving the Energy Efficiency of the WSNs by Optimal Relay Node Selection using Modified Gravitational Search Approach

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Abstract- Energy is one of the major constraints of conventional wireless sensor network that remains dependent on battery power. Hence, the energy efficient operations are mandatory to enhance the performance and lifetime of WSN. Therefore, the energy consumption of WSN will be addressed with novel schemes for the selection of cluster head and relay node. This manuscript will focus on the novel optimization schemes to reduce the power consumption at cluster head as CH plays important role in data acquisition, transmissions from all other nodes of respective cluster. The proposed novel optimization concept has reduced energy consumption of CH and relay node by 30%. Thereby, the energy efficient operations of CH and relay node has improved the lifetime of WSN. This paper reports the development of novel optimization scheme and its impact.

Keywords: Cluster head, energy efficiency, fitness function, gravitational search algorithm, LEACH, network lifetime, relay node, routing, WSN.

I. INTRODUCTION

In wireless communication, an important role is played by WSNs or wireless sensor networks. A wide range of applications for WSNs is included in healthcare, civil, and military fields. The information on the physical area can be collected by the nodes and they will make the transmission that data to the base station (BS) [1].

The sensor nodes will exchange data with the cluster head (CH) in the network and it will act as a data aggregator. However, the aggregated data is transferred to the BS by CH. Due to the essential fusion role, the sensor node's information is aggregated in CH and it helps to reduce the sending of data to the BS. Hence, the bandwidth resources and energy are saved. In organizing applications, the cluster is utilized widely in which a natural technique is implemented for integrating spatially closed sensor nodes to gain the benefit of correlations and the decrement of revealed redundancy in the sensor readings [2].

To manage the network topology and medium access control, the technique of multi-hop routing is applied that will result in weighty overhead. The more effective one is a direct one-hop routing if the total sensor nodes were closer to the sink node [3]. In other cluster-based track protocol, the portion of a CH has been focused on a particular area that is not suitable for critical applications that require more time. Some cluster-based track protocol has been used as it offers a space for each CH for forwarding the aggregated data to BS that reduces the conservation of energy [4].

As per the literature review, the main objective is the minimization of reduced energy conservation. The clustering scheme is one of the methods to decrease such energy utilization. The definition of clustering is described as the process of determining a natural association among some particular objects or data or the grouping of similar objects. It is utilized in WSN and is allowed in decreasing the participation of several nodes for long-distance communication to transmit the processed information to the BS. Thus, the total energy is reduced in a system. The most common method is concerned as multi-hop routing and clustering to enhance the network's energy efficiency. Instead of allowing each node in a network, the nodes are formed as groups known as clusters to forward the data to the BS directly. From other cluster member nodes, the CH node will gather the information and forward that processed data to BS. Such type of scheme has an advantage of twofold. To decrease the unwanted redundancy, the collected information from cluster member nodes can be compressed by the CH node in the first phase. Secondly, most of the nodes are allowed to transmit the information to nearer CH nodes, and the multiple hop communication to CH nodes only is limited that improves the energy efficiency greatly.

Energy efficiency is the major challenging task in WSNs. Clustering is a proven solution for WSNs to achieve energy efficiency. But, most of the existing clustering algorithms failed drastically in CH selection which leads to an increase in energy consumption. The optimal selection of the relay nodes efficiently decreases the energy utilization of the sensor nodes. Therefore, the proposed research work has introduced a new energy efficiency management algorithm, MGSA-ORS with novel CH selection parameters, and a modified gravitational search algorithm for optimal relay node selection. This algorithm selects CHs based on multiple parameters like sink distance, residual energy, and probability value. The sensor node distance to SINK consideration avoids unnecessary energy utilization due to the distance between the nodes. Also, the proposed MGSA considers every node's distance from their respective CHs and residual energy and delay in the links as the major parameters for relay node selection.

The proposed method improves the efficiency of CH over Conventional.

- The network life time is improved due to the optimal relay node selection and introducing modified GSA.

- The data sharing between CH and SINK is optimized as the CHs are selected according to sink distance to achieve energy saving.
- End-to-end delay of the data transmission is minimised due to the inclusion of nodes delay is the significant metric for optimal relay selection in MGSA.

The remaining part of the paper is organized as follows. The presentation of some of the recent researches regarding energy-efficient clustering protocols in WSNs is made in section 2. The proposed approach is demonstrated in section 3. The simulation parameters are represented and the simulation results are discussed in section 4 and the conclusion of the paper is included in section 5 finally.

II. LITERATURE SURVEY

Neamatollahi et al. [5] has been demonstrated a proposed fuzzy-based hyper round policy mechanism to overcome the problem of reclustering overhead in a WSN. To achieve the improved lifetime of a network, a policy of cluster head selection has been proposed based on the particle swarm optimization and fuzzy logic [6]. By using unequal cluster formation and proper selection of cluster head, a fuzzy-based unequal clustering algorithm was improved to determine the hotspot issues in a WSN [7]. With a fuzzy logic system that considers variable states in a network, a delay and energy-aware routing protocol is proposed in this work for a heterogeneous sensor actor-network.

Pantazis et al. [8] was presented a survey relevant to the energy-efficient routing protocols in WSNs. Zhang et al. [9] has been discussed an energy balancing routing protocol which helps to choose the next node based on the forward energy density and the link weight. For a duty-cycled WSN, an opportunistic routing protocol [10] was proposed that includes the consideration of residual energy with a forwarder selection algorithm. Sun et al. [11] has been proposed an algorithm of ant colony optimization-based routing according to the residual energy, transmission direction, and the communication transmission distance of a node. To make routing decisions efficiently, an energy-aware routing metric (i.e. a routing parameter) is considered in this work with the inclusion of distance, available free buffer, quality of a link, and residual energy.

Sindhvani and Vaid were addressed a vice cluster head low energy adaptive clustering hierarchy which increases the complexity level in the LEACH protocol. If the cluster head is damaged, the function of cluster head is processed using a vice cluster head. This will be helpful to minimize the huge amount of choosing a new cluster head every time if in case of damaging a cluster head. The BS will be retrieved the data that improves the lifetime of a network [12].

Liao and Zhu have been illustrated that the dependency of an energy-balanced clustering algorithm based on the LEACH protocol which is on the distance agents and remaining energy. However, the strategies of selection could be improved and not the cluster head selection in addition to the selection of the optimal cluster head [13].

Bakaraniya and Mehtawere proposed K-LEACH protocol for enhancing the lifetime of a sensor network through normal clustering using the k-medoids algorithm and scaling the entire network capacity among all of the active nodes. A total random selection of CHs is provided by the LEACH protocol which will lead to an increased lifetime reduction, poor energy maintenance and not performing a selection of CHs properly with the network [14].

Kole et al. was demonstrated the distance-based cluster formation technique that improves the LEACH protocol to achieve the increased lifetime of a network. In the cluster formation, the distance of a node from BS is very essential that will be used to decrease other transference in the current LEACH protocol [15].

Sai Krishna Mothku et al. and Rashmi Ranjan Rout et al. [16] were proposed a mechanism of fuzzy-based delay and energy-aware intelligent routing to select efficient routes. By using the network resources like distance or proximity, available buffer size, quality of link, and residual energy, the routing decisions have been made using a fuzzy logic system in the proposed mechanism. There is a chance of getting a node with good link quality, higher availability of free buffer, and close distance, and more residual energy has been turned as a next hop node in a routing path.

Amer O Abu Salem et al. and Noor Shudifat et al. [17] were focused on enhancement of LEACH (low energy adaptive clustering hierarchy) protocol to overcome the aforementioned limitations and proposed a clustering routing protocol which is extended for LEACH protocol through the detection of a cluster head based on the distance with lowest degree from the BS. This protocol has been used to reduce the consumption of energy in cluster head nodes across the overall network. The proposed LEACH protocol has a capability of achieving the improved lifetime of a network and minimization of conservation of energy.

The existing methods of FEARM[17] and ELEACH[18] protocols have included the drawbacks of increased routing overhead and higher rate of inactive nodes and increased consumption of energy respectively. To overcome these issues, the technique of MGSA-ORS is proposed for increasing the performance of a network with the cluster head selection effectively.

III. PROPOSED FRAMEWORK

The Proposed Protocol (Modified Gravitational Search Algorithm-Optimal Relay Selection) in detail is described below and comparison with existing methods as FEARM and LEACH.

MGSA-ORS is an energy-efficient cluster-based protocol which includes the even distribution of energy load among all sensor nodes in a network. The performance of the proposed protocol is characterized by 1) cluster head selection according to SINK distance, residual energy and probability 2) Multi-hop intra and inter-cluster communication that selects a multi-hop path with minimum communication energy.

The cluster heads are selected based on sink distance, residual energy and probability. Cluster members are sending

information to the cluster head directly. The data is aggregated by the cluster head and is transmitted to the BS based on the multi-hop routing paths. The major selection parameter is node distance from SINK. The inter-cluster communication's overhead is reduced for cluster heads that are nearer to the BS that will restrict them from an early death. By using a suitable path with minimum communication energy that means highest probability, the nodes are sending data to decrease the energy per data packet. The WSN life will be increased as per the above novel approach. MGSA-ORS operation is categorized into rounds in which each round has 2 phases such as set-up phase and steady state phase.

The organization of clusters and selection of multi-path from each cluster member to the CHs and the BS are done in the set-up phase. The information is transmitted in the steady-state phase. The set-up phase is smaller than the steady-state phase in the minimization of network overhead. Figure 1 represents the block diagram of the proposed system for efficient cluster head and relay node optimization.

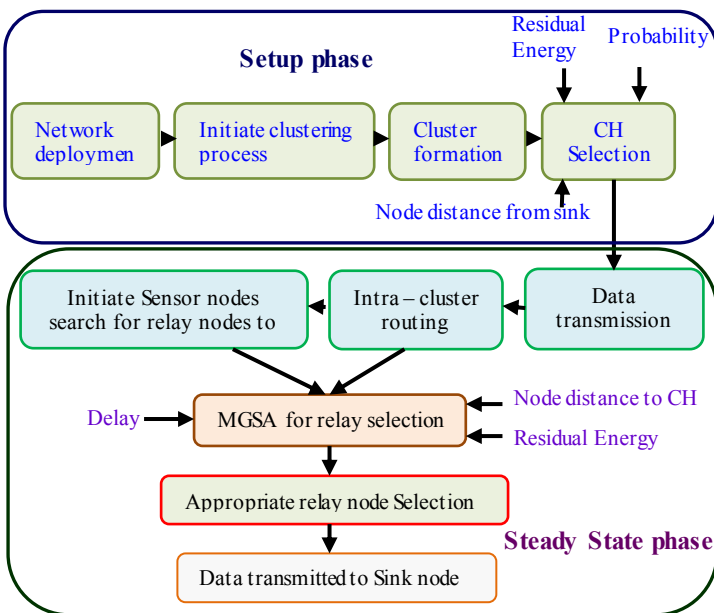


Figure1: Block diagram of proposed system.

3.1. Set-up phase:

The set-up phase involves cluster-head selection and cluster formation. The selection of cluster heads is made in the set-up phase. Hence, the clusters are created and multi-hop path is selected from each cluster head to the BS.

3.2. Cluster Head Selection:

In the initial stage of the set-up phase, each node estimates their distance from the SINK node share the distance information and residual energy details to the neighbour nodes. A probability is computed for every node using the random value between 0 and 1.

By using Euclidean distance, the distance between the SINK and sensor node is determined as follows:

$$d_{sink-node} = \sqrt{(xpos_{sink} - xpos_{node})^2 + (ypos_{sink} - ypos_{node})^2} \quad (1)$$

Where $xpos_{sink}$ & $xpos_{node}$ are the x position of the sink and node and $ypos_{sink}$ & $ypos_{node}$ are the y position of the sink and node respectively.

The residual energy can be calculated as follows in equation (2).

$$RE = E_{initial} - E_{consumed} \quad (2)$$

Where $E_{initial}$ is an initial energy of the sensor node and $E_{consumed}$ is energy consumed by sensor node when it utilized energy during data collection, transmission, receiving and aggregation.

The node becomes CH when node distance to the SINK have minimum and the residual energy is higher than the rest of the nodes.

Probability is the random number generated by the sensor nodes during CH selection. In some rare cases, two or multiple sensor nodes might have similar Sink distance and residual energy values. In those cases, the probability value determines the CHs. The probability for sensor node become cluster-head in the network can be calculated by using the equation (3).

$$p(\text{probability of cluster head}) = \frac{m}{n - m(\text{rmod} \frac{n}{m})} \quad (3)$$

Where 'n' denotes the number of sensor nodes in WSN, 'm' denotes the number of cluster heads at each round, and 'r' denotes the present working round.

3.3. Cluster formation

CH_ADV (cluster head advertisement) message has been sent by BS to its neighbours after completion of the successful selection of cluster heads. Here, the neighbour nodes are propagated based on the cluster heads outwards. The nearest cluster head is chosen by each member node from the received messages of CH_ADV according to their signal strength. The node is sending information to the BS directly if in a case that the lower direct communication cost to BS exists when there is no cluster head to join for a sensor node. Otherwise, the cluster with the nearest cluster head is decided to join by it. The JOIN message is sent to the cluster head by a node once every node has been decided on the cluster in which it is belonged to. A communication schedule is created if a cluster head is received the JOIN message from all nodes which would have been showed an interest to join in the cluster and the schedule is broadcasted to all member nodes. Thus, the organization of clusters is possible.

3.4. Steady state phase

The occurrence of data transmission is done in the steady-state phase. Both Intra and inter-cluster communication are involved in the network using multi-hop paths. Here, MGSA is introduced as an optimal relay node selection algorithm that chooses the relay nodes for the data transmission using modified gravitational search approach.

Gravitational Search Approach (GSA) is a population-based search algorithm in which each factor is experienced three steps in each round. The adjustment of efficiency and influence of a factor is made in the first step is known as adjustment. The

detection of cooperated factors with each other is done in the second step i.e. cooperation. The factors are competed with each other to attain more life in the third step called competition. According to the minimum delay, residual energy, and distance to CH, the GSA is utilized to search for the best route.

3.5. Background of Gravitational search algorithm

A stochastic optimization algorithm known as GSA is improved by taking inspiration from the law of motion and the law of gravitation. Using the universal law of gravitation by Newton, “objects in the universe attract each other with a force (F) which is directly proportional to the product of their masses (M_1 and M_2) and inversely proportional to the square of distance between them” as follows in equation (4):

$$F = G \frac{M_1 M_2}{R^2} \quad (4)$$

Where G indicates the gravitation constant and R refers the Euclidean distance between M_1 and M_2 .

A relationship between mass M of an object, applied force F on it, and its acceleration ‘a’, the law of motion is derived as follows:

$$a = \frac{F}{M} \quad (5)$$

For large masses, smaller acceleration will be included and vice versa. Both of these laws are integrated in GSA in which each object is considered as an agent that has an acceleration, velocity, position, and mass. By implementing the concept of gravitation force of attraction, agents are attracted each other according to GSA and the lighter or smaller agents are moved towards the bigger or heavier ones with a higher acceleration. The heaviest agent will be attracted by all agents finally. Based on its mass, an agent’s performance is computed. An optimal solution is represented by heavy mass for the given problem.

The basic GSA algorithm is defined with the following phases

- *Population initialization*

In this phase, the initial positions of the agents at time t is populated as follows equation (6)

$$X_i(t) = (x_1, x_2, \dots, \dots, x_n) \quad (6)$$

- *Fitness evaluation*

At each agent location, the fitness function is evaluated. For a minimization problem, the least one among all agents’ fitness values is the best one and the highest one will be the worst value.

$$\left. \begin{aligned} best_t &= \min fit(t) \\ worst_t &= \max fit(t) \end{aligned} \right\} \quad (7)$$

- *Update & calculations*

Based on the calculated fitness values, agents force, mass, and velocity are updated.

3.6. Modified GSA algorithm

By relying on the multi-objective Fitness function, the optimal relay nodes are chosen from the sensor nodes in WSN in

this paper. Based on the different objectives like nodes energy, distance to CHs, and delay, the maximization fitness function is proposed by the MGSA. The fitness function could be satisfied by each node through the providing of a maximum value to select the sensor node as a relay node. The multi-objective fitness function is expressed by the following equation (8).

$$fitness(n) = \{ Dist_{n-CH} + E_{res}(n) + D(n) \} \quad (8)$$

Where, $Dist_{n-CH}$ indicates the distance of a node ‘n’ from the respective CH, $E_{res}(n)$ indicates the residual energy of ‘nth’ node and $D(n)$ indicates the total delay of the sensor node ‘n’.

The explanation of multi-objectives is described in the fitness function as follows:

Delay: The WSN’s delay is defined as the total summation of delay at each node. The value of delay should be lower to choose the node as an optimal relay. By depending on the following parameters, the node’s delay is resulted directly.

- The node’s expected transmission count (ETC)
- Propagation delay of node
- The network’s transmission delay.

The nodes delay in the WSN is expressed using the below equation (9)

$$D(n) = \sum_{i=1}^n ETC_n (TD + PD_n) \quad (9)$$

Where, ETC_n indicates the node n’s expected transmission count (ETC), TD is the total transmission of the whole network and PD_n is the propagation delay at node n.

Distance to CHs: The distance between the cluster heads and nodes is the second objective of the fitness function. It should be low to achieve the effective communication. The equation (10) is used to compute the distance from sensor node to CHs as follows:

$$d_{node-CH} = \sqrt{(xpos_{CH} - xpos_{node})^2 + (ypos_{CH} - ypos_{node})^2} \quad (10)$$

Where $xpos_{CH}$ & $xpos_{node}$ are the x position of the CH and node and $ypos_{CH}$ & $ypos_{node}$ are the y position of the CH and node respectively.

Energy: To select the node as the cluster head, the energy of nodes should have higher value. By using equation (2), the residual energy of nodes is computed in WSN.

Based on the evaluation of these multi objective parameters the optimal relay nodes are selected for routing process.

3.7. Relay nodes

Generally, relay nodes are nothing but sensor nodes that forwards the data from one sensor to another sensor node. Routing protocols help the sensor nodes to find the best relay nodes with some unique parameters. In this work, the optimal relay node is selected by the MGSA algorithm.

MGSA takes sensor node distance to CH, node energy, and delay as the parameters for relay selection. During intra-cluster routing, the sensor nodes need to send the data to their

respective CHs. If the sensor node can detect CH within its coverage area, then the data can be delivered to CHs without the help of relay nodes. But in certain cases, direct connectivity may not exist between sensors and CHs due to the distance. In that situation, the sensor nodes are required to find out the relay nodes to transmit the data to the CH's.

In our proposed work, if direct connectivity does not exist between the sensor and CHs, then MGSA starts finding the relay nodes. First, MGSA estimates the distance of all the sensor nodes towards CHs, which means that it first, identifies the distance between the sensor nodes and the CH, then, estimates the energy and delay. Then finally, MGSA selects the nodes which have minimum distance to Cluster head and having high energy and less delay. After the relay nodes are selected, the sensor nodes start transmitting the data to their respective CHs through the selected relay nodes.

3.8. Algorithm for CH selection

$d_{i,sink}$ = distance between the nodes and BS (SINK distance);

$E_{i,res}$ = node i's residual energy

Pro_i = node i's probability;

CH[i] = cluster head list

For all the nodes $S = \{s_1, s_2, \dots, s_n\}$

BEGIN

For $i = 1; i \leq n; i++$ //For all the nodes n

While (selection of the CH)

For each testing cluster sensor node s_i (measure the multi-objective parameters)

Calculate SINK distance, $d_{i,sink}$

Estimate probability of sensor node Pro_i

Evaluate residual energy $E_{i,res}$

if(($d_{i,sink} < d_{i+1,sink}$)&& ($E_{i,res} > E_{i+1,res}$) && ($Pro_i > Pro_{i+1}$))

//Select sensor node s_i (communication Energy αPro^{-1})

CH[i] = s_i informs about its CH election to other nodes

Else

CH[i] = s_{i+1} Joins with the nearest CH as cluster member

End for

If $n \in CH[i]$

End

3.9. Algorithm for MGSA

P_i = total participating particles

f_i = fitness of the particles; B_{fit} = best fitness of the node

E_{res} = residual energy;

D_n = Delay of node n

$dist_{i,CH}$ = distance between the nodes and CH

ORN = Optimal relay node

##

For all the nodes n

Calculate f_i of all particles P_i

Estimate E_{res}

Calculate $dist_{i,CH}$

Calculate D_n

$f_i = \{dist_{i,CH} + E_{res} + D_n\}$

End

$B_{fit} = \{\max[f_i]\}$ // maximum fitness function value.

For all the nodes n

If ($B_{fit} P_i > B_{fit} P_{i+1}$) //fitness path for relay nodes.

ORN = P_i

Else

ORN = P_{i+1}

End for

IV. RESULTS AND INTERPRETATIONS

4.1. Experimental setup

To assess the proposed method's performance, the simulation is conducted by comparing it with two different schemes. NS2 network simulator has been used in this concept and it is an object-oriented and discrete event-driven network simulator that targets the research of networking.

In this work, the network model is used in which fixed sensor nodes in a network are existed with homogeneous types with the same radio-transmitter devices, same capabilities, and constrained power resources, having the same initial energy, and uniform deployment. Here, the location of BS is static and distant away from the sensor node. By using static nodes and plane coordinates, the simulation tests are conducted. Limited energy nodes are assumed and the transmission or reception of information can be restricted after the node's initial energy is used up. The simulation parameters are included while performing the test and they are mentioned in this below table 1.

4.2. Simulation result and analysis

The various simulation results of different scenarios are discussed in this section. In the area of 1000 x1000 m and a network of 50 nodes, the secure model is implemented.

Table1: Simulation table

PARAMETER	VALUE
Application traffic	CBR
Transmission rate	1024 bytes/ 1ms
Radio range	250m
Packet length	1024 bytes
Routing Protocol	AODV
Simulation time	100s
Number of nodes	50
Area	1000 x1000
Routing methods	MGSA-ORS, FEARM [16], ELEACH [17]
Transmission Protocol	UDP
Initial Energy	100J

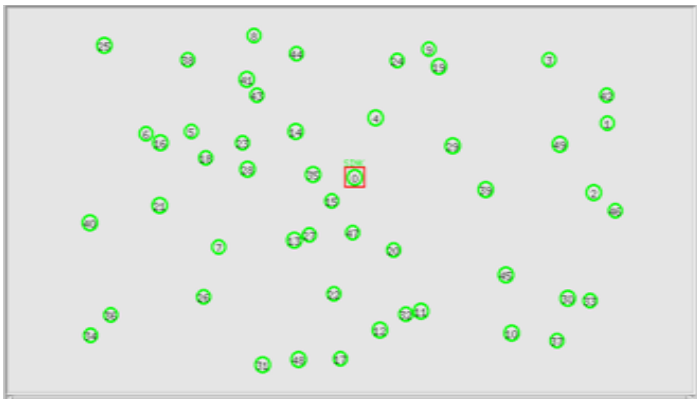


Figure.2. Network deployment

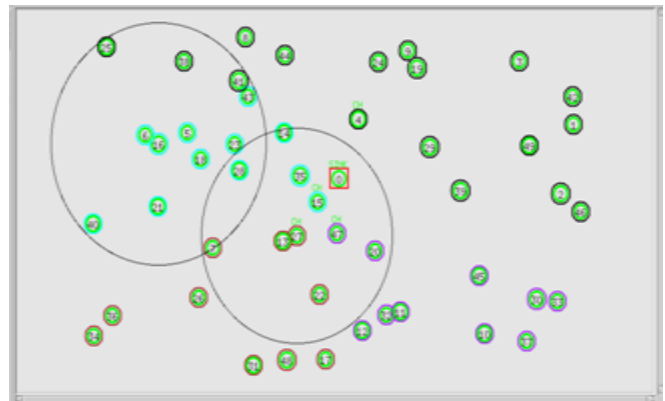


Figure.3. Clustering process

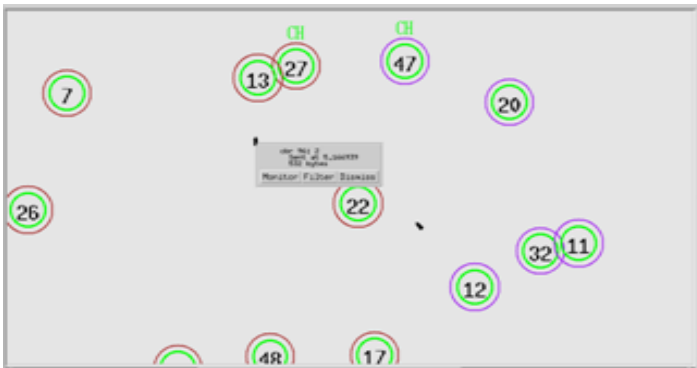


Figure.4. Data communication between sensor nodes and CH's

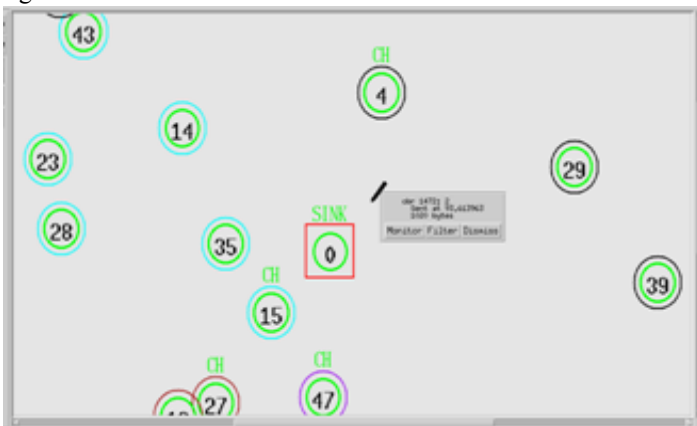


Figure.5. Data process between CH's and SINK node

In the above Figure 2, the sensor nodes are deployed in the network with an area size of 1000x1000 randomly. The nodes are assigned with 100 joules of energy and are shown with numbers.

The deployment of nodes is made in a random direction. At the network's center, the sink node is located for easier access. Clustering and sharing of control packets are presented in Figure 3. The network is divided into 4 clusters and these clusters are associated with their respective CHs. The CH selection values are shared with the neighbor nodes using the broadcasting of control packets. In the broadcasting process at cluster heads, the sensor nodes start transferring the data packets to their respective CHs. The forwarder node selection is enhanced by modified gravitational search algorithm and the data packets are transferred

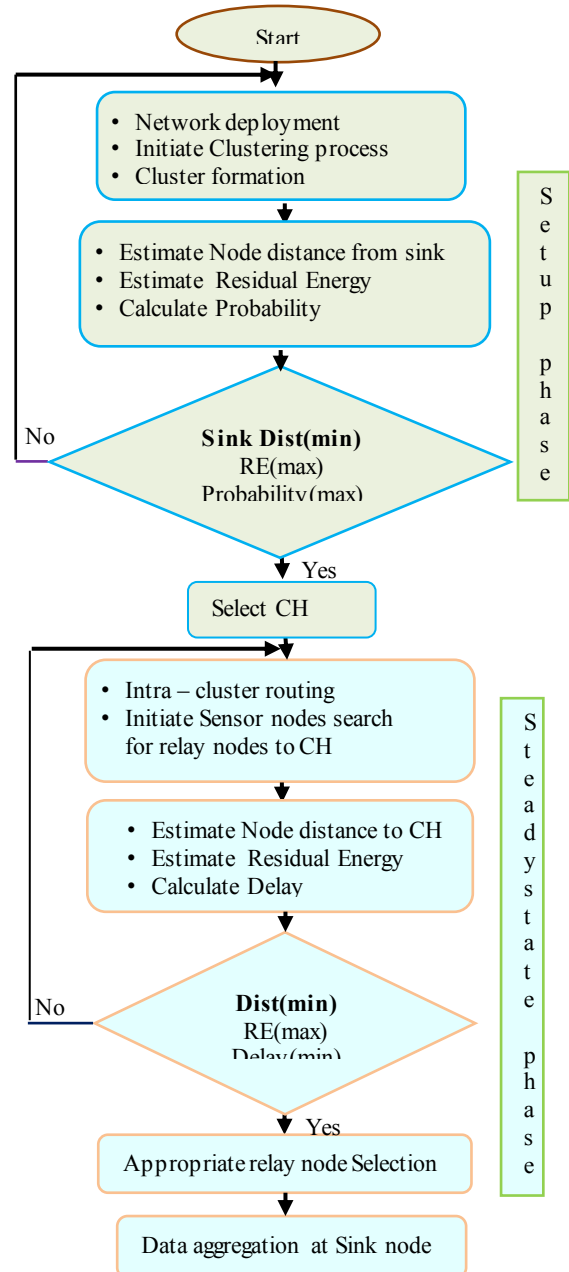


Figure.6. Flow chart for proposed method

to the respective CHs using the selected forwarder nodes.

Table.3.Multi-objective parameters

Node	Sink Node	Sink (x_pos,y_pos)	Node (x_pos, y_pos)	Distance from Sink(m)	Probability	R.E(J)
7	0	(511,344)	(260,223)	278.643141	0.368065	99.032503
13	0	(511,344)	(400,235)	155.569920	0.508204	98.948766
17	0	(511,344)	(484,26)	319.144168	0.902347	98.957795
22	0	(511,344)	(472,142)	207.694487	0.572885	98.909717
27	0	(511,344)	(427,244)	130.598622	0.91258	99.880130
31	0	(511,344)	(341,16)	369.437410	0.585115	99.073502
34	0	(511,344)	(25,68)	558.902496	0.235653	99.325084
36	0	(511,344)	(61,103)	510.471351	0.103633	99.260817
48	0	(511,344)	(408,25)	335.216348	0.896038	99.029993

In above Figure 4, data communication between sensor nodes and CH's is shown in which the data unit size transferred between the sensor nodes and CH is 532 bytes. The CHs aggregates the data from their respective cluster members and share the data to the SINK at particular intervals.

Figure 5 is mentioned about the process of data between SINK node and CH's. After aggregating the data from the sensor nodes, the CH nodes are transferring the data to the SINK. If there is no direct connectivity between CH and SINK due to long distance, then the modified GSA finds the best forward nodes and establishes the route between them.

Table. 2. Clusters

Cluster -1:	7 13 17 22 26 27 31 34 36 48
Cluster -2:	10 11 12 20 30 32 33 37 45 47
Cluster -3:	5 6 14 15 16 18 21 23 28 35 40 43
Cluster -4:	1 2 3 4 8 9 19 24 25 29 38 39 41 42 44 46 49

Clusters are shown in above Table.2. Cluster formation after broadcasting of control packets among the nodes. The network is divided into 4 clusters totally. Each cluster having unequal number of member nodes of their respective locations in the network area.

The flowchart for proposed method is shown in Figure 6. The multi objective parameters (Sink distance, residual energy, probability) are obtained by comparing multi-objectives of one node with neighboring node's multi-objectives. From which the particular metric should be measured either maximum or minimum. Table.3. is discussing about the multi-objective parameters, sensor node, sink node and their locations. Multi-objective parameters like distance to SINK, residual energy (R.E.) and node probability value are considered for CH selection. The node 27 is selected as cluster head because of less distance from sink. After clustering, every node in the cluster shares these details to the remaining nodes within the clusters and based on the shared values CHs are selected for each cluster. The delay defines the efficiency of the network. Higher delay affects the overall network performance. Performance on delay is shown in Figure 7. The MGSA selects the forwarder nodes based on multi-objective parameters and estimation of distance between the nodes is the major parameter which reduces the delay during data transmission.

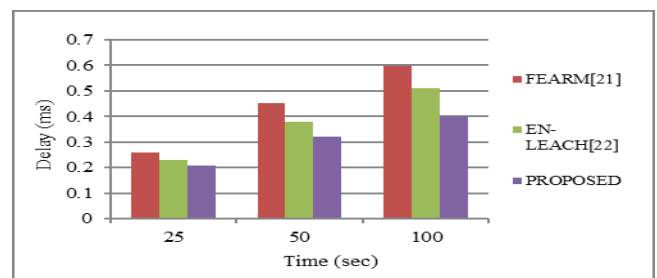


Figure.7. Performance on Delay

The results of simulation prove that the delay is comparatively lesser than the previously used protocols.

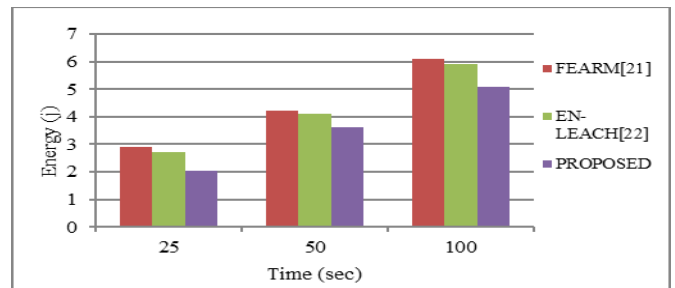


Figure.8. Energy consumption

Energy is the vital factor for the sensor nodes to participate in network activities. The minimum energy consumption will lead to the prolong lifetime of a network. Major energy consumption happens during data transmission. The MGSA forwarder node selection decreases the conservation of energy by proper forwarder node selection. Figure 8 is illustrated the results of energy consumption which proves that the proposed algorithm optimizes the consumption of energy than other protocols.

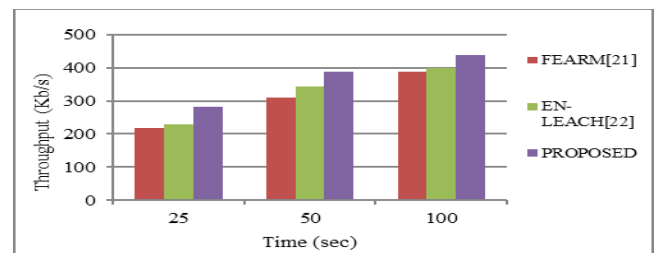


Figure.9. Throughput

Throughput defines the successful data delivery rate. Various factors affect the data transmission often and these can be avoided by efficient forwarder node selection process. The MGSA-ORS algorithm selects forwarder nodes based on multi-objective criteria which help to deliver the data with less delay. Figure 9 is shown the graphs of throughput which proves that the proposed MGSA-ORS algorithm delivers data successfully than the previous protocols.

Overhead defines the amount of complexity the network experienced to process these algorithms. Less overhead yield good results to the network. The use of MGSA and the data aggregation using the MGSA selected forwarder nodes reduces the routing complexity. Figure 10 is describes the routing overhead results where the CH selection is also decided by the distance to SINK parameter which further reduces the communication overhead between CH and SINK.

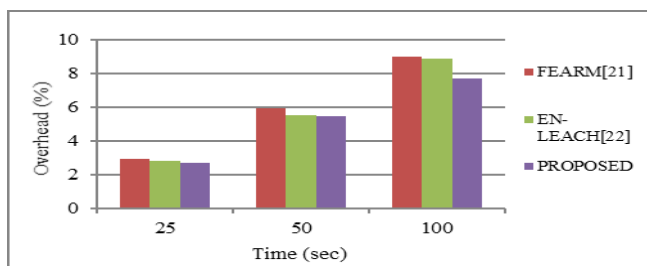


Figure.10. Routing overhead

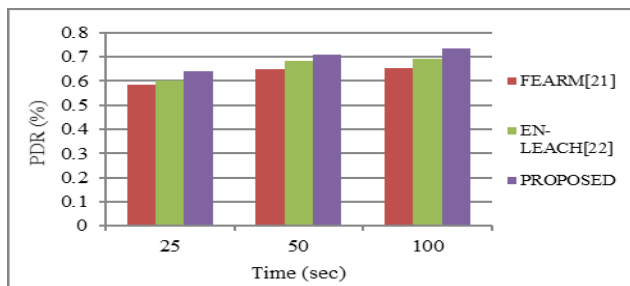


Figure.11. Packet delivery ratio

PDR defines the ratio of successful data deliveries over time. Improper forwarder node selection often affects the PDR due to delay and packet drops. The MGSA-ORS alleviates this and selects the forwarder nodes with sufficient capacity to transfer the data. Figure 11 is presented the simulation results of packet delivery ratio and it shows that the PDR value is higher than the previously proposed algorithms.

V. CONCLUSION

The energy consumption of WSN addressed with novel schemes for selection of cluster head and relay node using multi-objective CH selection. The important advantage of MGSA is using the multi-objective parameters for route discovery and the efficient route is chosen with the help of node distance to CHs, energy, and delay of the sensor nodes. CH selection is optimized using the multi-objective parameters like distance to SINK, residual energy, and probability value. The simulation results prove that the proposed multi-objective MGSA-ORS method achieves high energy efficiency with less overhead to the network. Because of CHs selection by the distance between nodes and SINK approach, the

improved throughput and data delivery rate have been achieved for inter-cluster data aggregation. The use of MGSA achieves high efficiency with the inclusion of multi-objective parameters. The proposed MGSA-ORS is outperformed all the major energy-efficient routing protocols in every possible way by assessing the experimental results. Even though our proposed mechanism selects reliable Cluster heads, CH failure is inevitable in energy-constrained, clustered WSNs. So, this work can be further extended to improve CH reliability and providing fault-tolerance with optimized energy consumption.

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International Conference on Innovations in Engineering, Technology and Sciences (ICIETS)

277	Change Detection of Polarimetric SAR Data for Monitoring of Agricultural Areas <i>Nidhi Davawala, Neelanshi Varia, Sanid Chirakkal, Dipanwita Haldar, Deepak Putrevu and Ranendu Ghosh</i>	93
278	Rational Decision Making Framework for Implementing Information System <i>Mahady Hasan, Ahmed Latif Shahriar, Nuzhat Nahar and M Rokonzaman</i>	94
279	Analysis of Dual Polarized Antennas for MIMO Appliaction <i>J.S.Upadhyay, I.Balakrishnal and Dr.P.H.Rao</i>	94
280	Analysis of a Seq-2-Seq Approach to an End-To-End Conversational Model <i>Ishita Kumar, Prssanna Desai, Surbhi Gawande, Rishabh Nambiar and Dr.Mahesh Maurya</i>	94
281	One-Wire Communication based on PWM Technique <i>Arnob Kumar Bairagi</i>	95
282	Industrial Smart Centralized Power monitoring System using Internet of Things Implemented in Forging Machine for Power Consumption <i>Neelima Kolhare, Pratiksha Kasbekar, Dr Ulhas Shinde and Aditi Someshwar</i>	95
283	Sensor Node Selection for Distributed Beamforming in Wireless Sensor Networks and Algorithm for Sidelobe Control in Collaborative Beamforming <i>Vinita Edlabadkar and Shivraj Singh</i>	96
284	Surface Morphology & Performance of Cuo Nanoparticles Coated Evacuated Tube for Domestic Solar Water Heater <i>Rupeshkumar V. Ramani, Bharat M. Ramani and Anjana D. Saparia</i>	96
285	Bus Travel Guide Using GPS <i>Sasinas Alias Haritha Z A, Anoop P, Arathi S, Ajay P, Sreelakshmi B and Greeshma Vijayan</i>	96
286	Appying Shannon's Entropy for the Evaluation of Social Development in South America <i>Alexi Delgado, Ayala Huamani and Betsabe Brillitt</i>	97
287	Design of a Web System to Improve Logistics Management in a Mass Consumption Distributor <i>Alexi Delgado, Chanamoth Oversluijs Hillary and Manco Arias Aylin</i>	97
288	Rain Detection and Intensity Measurement using Smartphones and Audio Clips <i>Antony Vigil, Swetha Kumar and K S C Animisha</i>	97
289	Sensor-Cloud: the Recent Virtualization Paradigm for IoT-based Heterogeneous WSNs <i>Nasr Musaed S. Almurisi and T. Srinivasulu</i>	98
290	Mineral Mapping and Lithological Discrimination using Remote Sensing in Indian Region: a Review <i>Ranjana Waman Gore, Smita Kasar and Abhilasha Mishra</i>	98
291	Secured Wireless Multi Robot Communication for SWARM Robotics using Mobile Application <i>Karan Gandhi, Rohan Jain, Tushar Manak and Kashyap Joshi</i>	99
292	Interference Tracking System in Manets using Multilayer Perceptron Neural Networks <i>Mrs. Swetha M. S, Dr. Thungamani M and Mr. Muneshwara M. S</i>	99
293	Compact Low Loss Design and Simulation of LiTaO3 Asymmetric Y-Branch Power splitter <i>D.Neelima Patnaik and C.P. Vardhani</i>	99
294	Temperature and Humidity Monitoring System using IoT in Server Rooms <i>KushalAgarwalla, Shubham Nandan, Varun Anil Nair and Dhikhi .T</i>	100
295	Threshold Voltage Modeling of SiN/AlGaN/GaN-based MISHEMTs using Distributed Surface States <i>Joydeep Ghosh</i>	100
296	Nowcasting of Rainfall using Deep Learning <i>Maitreya Patel, Anery Patel and Dr. Ranendu Ghosh</i>	100
297	Intelligent Traffic Light System based on Density <i>Raiyyan Malik, Komal Bhagat, Prachi Kaushik and Maansi Gupta</i>	100
298	Analysis and Design of Mathematical Modeling of Solar Inverter <i>K.Sridharan, V. Krithika, M. Mohamed Rabik and M.Nandhini</i>	101
299	Comparative Study of Energy Aware Routing Protocols <i>Mr.Gaurav Vishnu Londhe and Dr.Dilendra Hiren</i>	101
300	Design of an Interactive Environment for Studying Digraps Theory using UML and Java SE <i>Anca-Elena Jordan</i>	101

The major problem in grid-connected power transmission and distribution networks is the quality issues due to the unbalance loads. The power quality issues related to the current and voltage-based issues generated at the PCC (point of common coupling). Some of the current issues related to reactive power extraction, poor zero voltage regulation, harmonic currents, undesired neutral current, and low power factor. Several D-STATCOM compensation techniques have been introduced for the compensation of power quality issues in the three-phase and four-wire system. The proposed work focuses on D-STATCOM soft computing techniques such as widrow-Hoff least mean square, vectorial filter, discrete adaptive filter, and quasi-Newton control algorithms. The proposed algorithms controlled the switching pulses to drive the voltage source converter (VSC) section in the network thereby mitigating the D-STATCOM reactive power generation in the grid-connected photovoltaic (PV) system. The soft computing techniques have maintained constant DC bus coupling capacitor voltage and common voltage maintaining unity power factor, zero voltage regulation for linear and non-linear loads.



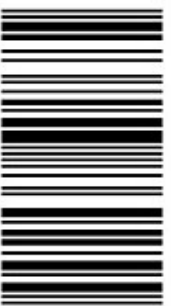
Bellamkonda Pragathi
Tadisetty Srinivasulu
Ramesh Chandra Poonia

Mitigation of Power quality issues for the PV systems using FPGA

Mitigation of Power quality issues for the Grid-connected photovoltaic system using FPGA



Bellamkonda Pragathi working as an Associate Professor at MIC college of technology. I have received a doctoral degree from KL University. I have published papers in Scopus, ESCI and SCI.



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Session 1.1		Optical/ Satellite Communication
025	Design and analysis of multiplexed FSO system with DPSK and Manchester coding	1 <i>Jagana Bihari Padhy and Bijayananda Patnaik</i>
101	Investigation of GDOP for IRNSS	7 <i>K.J. Manjunath, K.L.Sudha and S.K.Raman</i>
107	Enhanced Road Edge Detection (E-RED) for an Autonomous Planetary Rover	13 <i>Nandakishor Jahagirdar, Anand Hiremath, Sudeesh Balan and Mithileysh Sathiyarayanan</i>
019	Impact of traffic burst on the behavior of TCP variants for different LTE downlink schedulers	18 <i>Adesh N. D. and Renuka A.</i>
072	A Reliable Fault Detection and Classification Scheme based on Wavelet transform and Ensemble of SVM for Microgrid Protection	24 <i>Murli Manohar, Ebha Koley and Subhojit Ghosh</i>
Session 1.2		Computing Applications
030	Automatic Sarcasm Detection Review	29 <i>Paras Dharwal and Tanupriya Choudhury</i>
031	Detecting Oral Cancer Using Fuzzy Logic	35 <i>Arushi Tetarbe and Tanupriya Chaudhary</i>
032	Image Enhancement of Old Manuscripts Using Machine Learning	40 <i>Rishabh kataria</i>
033	Challenges Faced by Cloud Computing	50 <i>Shouray Kumra and Tanupriya Choudhary</i>
034	Intellectual Performance Analysis Of Students by comparing various Data Mining Techniques	57 <i>Tanupriya Choudhury and Anoushka Jain Mail</i>
129	An Efficient survey to Detect Alzheimer using Data Mining Techniques	64 <i>Tanupriya Choudhury</i>
Session 1.3		Machine learning(I) /Image Processing
036	Smart Detection of Rice Purity and its Grading	71 <i>Manohar M, Chatrapathy K and M S Sowmya</i>
038	Multiclass genetic programming based approach for classification of intrusions	74 <i>Sunitha Gp and Rio D'Souza</i>
115	Copy-Move Forgery Detection using Hybrid Transform and K-means Clustering Technique	79 <i>Tawheed Jan Shah and M. Tariq Bandy</i>
085	Autonomous Photo Clicker and Website Up loader System	84 <i>Dhara Rangani, Nikunj V. Tahilramani and Vandana Talreja</i>
127	A Novel Approach for the Brain tumor detection and Classification using Support Vector Machine	90 <i>Shankaragowda B.B., Siddappa M. and Suresha M</i>

Session 2.1

Theoretical Computer Science

- 012 **Design and performance analysis of multipliers using Kogge stone adder** 94
Aradhana Raju and Sudhir Kumar Sa
- 063 **Prototype Model to Improve the Quality of Disability Students Performance towards Mining Technology** 100
P.Saraswathi and N. Nagadeepa
- 095 **Low Power VLSI Architecture for LTE Binary to Gray Converters** 104
U Ragavendran , M Ramkumarraja and M Ramachandran
- 113 **Automation Based Elevator Control System** 110
Dhara G. Rangani and Nikunj V. Tahilramani
- 106 **Data Rate Based Performance Analysis and Optimization of Bulk OUT Transactions in USB 3.0 SuperSpeed Protocol** 114
Adithya Rangan C.K. , Aravinda Holla K.y, Vikas Kulkarniz, Anurag Kumarx and Akshay Patil
- 120 **ECG Signal De-noising using Complementary Ensemble Empirical Mode Decomposition and Kalman Smoother** 120
Keshavamurthy T G and M. N. Eshwarappa

Session 2.2

Internet of Things (I)

- 041 **Smart Street Lights using IoT** 126
Lakshmana phaneendra maguluri
- 075 **IOT Based Energy Efficient Security System** 132
Amreen Saba and Nagarathna
- 104 **Challenges and Opportunities of Integrating Internet of Things (IoT) and Light Fidelity (LiFi)** 137
Mithileysh Sathiyarayanan, Vignesh Govindraj and Nandakishor Jahagirdar
- 014 **EH-mulSEP: Energy-Harvesting enabled Multi-level SEP Protocol for IoT-based Heterogeneous WSNs** 143
Antar Shaddad Abdul-Qawy and T. Srinivasulu
- 112 **MQTT Based Environment Monitoring In Factories for Employee Safety** 152
Ravi K Kodali and Aditya Valdas
- 057 **Challenges in Annotation and Domain Adaptation in Hindi POS Tagger: with Reference to Cricket** 156
Anupama Pandey, Srishti Singh, Atul Kr. Ojha and Girish Nath Jha

Session 2.3

Wireless Communication / Wireless Networks

- 093 **HSS: Health Supporting System Using Smart Intelligence** 161
Soundarya M , Suraj K, Adarsh K and Ajay Prakash B.V
- 010 **Data Processing in Semantic Sensor Web: A Survey** 166
Lokesh B. Bhajantri and Pundalik. R
- 027 **Efficient Routing Algorithm for Disaster Recovery over Wireless Mesh Networks Based Communication System** 171
Chinmay Chakraborty, Chaitany and Krishnan Gupta
- 110 **Coin Based Mobile Battery Charger with High Security** 176
Dhara G. Rangani and Nikunj V. Tahilramani
- 122 **An Ephemeral Investigation on Energy Proficiency Mechanisms in WSN** 180
Achyutha Prasad N and C D Guruprakash

Session 3.1

Internet of Things(II)

- 111 **MQTT Based Vehicle Accident Detection and Alert** 186
Ravi K Kodali and Shubhi Sahu
- 065 **Energy efficient Smart Street Light** 190
Kodali Ravi Kishore and Yerroju Subbachary
- 066 **IoT Based Smart Emergency Response System for Fire Hazards** 194
Kodali Ravikishore and Yerroju Subbachary
- 067 **Smart Solid Waste Management** 200
Ravi Kishore Kodali and Venkata Sundeep Kumar Gorantla
- 068 **Weather Tracking System using MQTT and SQLite** 205
Ravi Kishore Kodali and Venkata Sundeep Kumar Gorantla
- 096 **Smart Notice Board System** 209
Dhara G. Rangani and Nikunj V. Tahilramani
- 082 **Transforming Agriculture using the Internet of Things (IoT)** N/A
M. Shankar Lingama and A. M. Sudhakara

Session 3.2

Machine learning(II)/ Antennas

- 045 **Regression algorithms for efficient detection and prediction of DDoS attacks** 215
Gudipudi Dayanandam, E. Srinivasa Reddy and Dasari Bujji Babu
- 053 **Unsupervised feature learning using Deep learning approaches and applying on the image matching context** 220
Suyog Trivedi, Rajesh Kumar, Gopichand Agnihotram and Pradeep Naik
- 074 **Congestion Detection in Wireless Sensor Networks Using MLP and Classification by Regression** 226
Jayashri B. Madalgi and S. Anupama Kumar
- 099 **An Innovative Optimized Model to Anticipate Clients about Immigration in Telecom Industry** 232
Midde.Venkateswarlu Naik and Sareddy Shiva Reddy
- 103 **Protection policy in networked locations using machine learning and data science approach** 237
S. Sai Satyanarayana Reddy, Ramesh Shahabadkar, Ch. Mamatha and Priyadarshini Chatterjee
- 051 **Gain Enhancement of PIFA with DGS for Wireless Communication** 241
Prakriti Aggarwal, Parnika Saxena and Shuchismita Pani
- 052 **Analysis of PIFA With Improved Bandwidth & Gain For Wireless Application** 246
Parnika Saxena, Prakriti Aggarwal and Shuchismita Pani

Session 3.3

Applications of Communication

- 024 **Smart Street Lights using IoT** N/A
lakshmana phaneendra maguluri, Yaswanth Sri Venkatesh Sorapalli, Lokesh kumar Nakkala and Venkat Tallari
- 088 **IOT Based Energy Efficient Security System** N/A
Amreen Saba and Nagarathna
- 125 **Challenges and Opportunities of Integrating Internet of Things (IoT) and Light Fidelity (LiFi)** N/A
Mithileysh Sathiyarayanan, Vignesh Govindraj and Nandakishor Jahagirdar
- 020 **Role of Web Service in Internet of Things** 268
M. Thiagarajan and Chaitanya Raveendra
- 086 **Security Against Morphed Speech based on Speaker Verification system** 271
Nikuj Tahilramani and Vandana Talreja

Session 4.1

Network Security

- 108 **Distributed Authentication and key Exchange Approach for Secure M2M Communications** 277
B. Sathyanarayana Murthy
- 035 **Group Diffie Hellman Key Exchange Algorithm Based Secure Group Communication** 281
Lavanya R and S V Sathyanarayana
- 015 **Securing IoT using Layer characteristics** 290
Anil Kaushik, Shail Talati, Varun Anand and Rishikesh Basu
- 011 **Range-Bound Pricing of Channels in Multichannel Multiuser Cognitive Radio Networks** 299
K. Annapurna and B. Seetha Ramanjaneyulu
- 089 **Building RMS for a RD using Wordnet** 304
Shete Padmini and G. A. Patil
- 039 **Teaching Formal Methods at Undergraduate/Graduate Level: The Three Perspectives** 310
Natasha Jeppu, Yogananda Jeppu and M K Kavitha Devi

Session 4.2

Applied Computing

- 097 **A comparative study on Load-balancing Algorithms for Cloud Environments** 316
Pushpa R and M. Siddappa
- 071 **Self-Organizing Maps Classification with Application to the Low-Frequency Magnetic Field Emitted by Portable Computers** 322
D. Brodić and Ivo R. Draganov
- 116 **Outlier Detection in Data Streams using MCODE Algorithm** 328
Vishnu vardhanreddy salimidi
- 062 **Directory Services for Identity and Access Management in Cloud Computing** 334
M. Tariq Bandy and Saima Mehraj
- 130 **Practitioner's Guide for Building Effective Complex Enterprise Architecture in Digital Transformation** 338
Sreekumar Vobugari, Madhan Kumar Srinivasan and Somayajulu DVLN
- 029 **An Efficient Method to Predict Software Quality Using Soft Computing Techniques** 347
Ayush Rai, Tanupriya Choudhury, Sheetal Sharma and Kuo-Chang Ting
- 131 **An ISFET automated output calibration system implementation on reconfigurable FPGA device with MATLAB Artificial Intelligence interfacing** 354
Deepa Saini, Ajay Rupani, Gajendra Sujediya and Tushar Sharma
- 055 **san_sim: Factual and Efficient URL Text Similarity Algorithm** 359
Sandhya and Udayan Ghose
- 109 **Granularity based Image processing Eco system in Hadoop Predict the detailed results for different Medical Images** 365
Sunny B. Mohite and G. A. Patil

Additional Papers:

- An information divergence based approach to detect flooding DDoS attacks and Flash Crowds** 251
Gursharanjeet Kaur, Sunny Behal, Shifali
- Design and Simulation of FPGA based All Digital phase locked loop (ADPLL)** 259
Shruti Edway, R K Manjunath
- Analysis of Big Data Security Practices** 264
Revathy P, Rajeswari Mukesh

From The Desk of Honorable Founder,
KISS & KIIT



I am glad to learn that *International Conference on Electrical, Electronics and Communication Engineering (ICRIEECE 2018)* will be organized by KIIT School of Electrical Engineering on 27 - 28 July 2018. The theme of the Conference “Recent Innovation in Electrical, Electronics & Communication Engineering” is very appropriate.

Change is the way of life and innovation is the part of the change. Learning takes place beyond the four walls of Classroom. Hands-on learning and Experiential Education has replaced chalk and talk for good. The young minds come up with new ideas and disrupt when the opportunities are given to them. This is a platform for young ideas to explore, innovate and drive the change. But innovation is meaningful if it makes the human existence convenient and removes sufferings and deprivation from the face of earth. In this context, I would like to appreciate the idea of Social Innovation which has been the change maker for Social problems. Young minds should use science and technology for society. The marriage of the three is the most accepted and required in present times.

I hope the conference brings out some path- breaking solutions and innovations and epiphanies. I welcome all the participants to this conference that shall bolster collaboration and brainstorming.

I wish all the participants all the very best. Wishing all the organizers Godspeed!

Dr. Achyuta Samanta
Founder- KIIT and KISS

From The Desk of Vice Chancellor,
KIIT Deemed to be University



In an expanding economy, electricity plays a vital role, hence the research and innovation in this field of engineering study has immense importance.

I am happy to note our School of Electrical Engineering has heeded to the call today's world and in response, it is organizing a conference on *Recent Innovations in Electrical Electronics and Communication Engineering (ICRIEECE)* during 27-28 July, 2018 at University campus. I am sure it will attract scholars and young researchers to assemble and discuss on trends of research and innovations in different areas to meet the pressing needs for the clean, green and sustainable electricity generation and distribution.

I welcome all the participants for rigorous and fruitful participations in the conference, wishing them a happy visit to this clean, green and socially responsive campus. I also congratulate the School of Electrical Engineering for their academic pursuits and efforts in organizing this conference.

Wishing a great success to the Conference.

Prof. Hrushikesh Mohanty
Vice Chancellor
KIIT, Deemed to be University

From The Desk of Registrar,
KIIT Deemed to be University



I am glad to know that School of Electrical Engineering, KIIT Deemed to be University is organizing an International Conference on “*Recent Innovation in Electrical Electronics & Communication Engineering (ICRIEECE)*” on 27th & 28th of July, 2018 at KIIT, Bhubaneswar. The theme of the conference is a right choice for discussion among the eminent researchers in different field of Engineering. Open Discussion in the Recent Innovations in Electrical, Electronics & Communication Engineering are required to provide uninterrupted quality power supply to consumers and hence reducing pollution in the environment which includes quality living. Researchers across the Globe are taking up this for research. I am happy that the School has taken up this research challenge by organizing this International Conference (ICRIEECE) at KIIT premises.

I wish, the conference succeeds in providing a platform to faculty members, researchers, Ph. D scholars, M. Tech and B. Tech students and also to industry professionals for engaging deliberations on the research theme. Glad to know the researchers from different premier institutes across the globe have contributed their papers to the conference. I welcome all the participants for a fruitful participation.

I appreciate the efforts made by all the committee members of the conference in making the conference a success.

Prof. Sasmita Samanta
Registrar
KIIT, Deemed to be University

From The Desk of Pro Vice Chancellor (SoT),
KIIT Deemed to be University



I am glad to know that School of Electrical Engineering, Kalinga Institute of Industrial Technology, Deemed to be University, Bhubaneswar is coming up with their much appreciated Proceedings in the eve of the International Conference on “*Recent Innovations in Electrical, Electronics & Communication Engineering-ICRIEECE*” (July 27th & 28th, 2018), which portrays the work of the students and faculty of the School. It provides a platform for sharing knowledge and skills with faculty members, researchers, M. Tech and B. Tech students and also industry professionals for engaging deliberations on the research theme.

I wish the Conference a grand success.

Prof. Rambabu Kodali
Pro Vice Chancellor
KIIT, Deemed to be University

From the Desk of Advisor, Quality and Assurance Cell,
KIIT Deemed to be University



I am glad to know that KIIT School of Electrical Engineering is organizing an International Conference on “*Recent Innovation in Electrical Electronics & Communication Engineering (ICRIEECE)*” on 27th & 28th of July, 2018 at KIIT, Bhubaneswar in support IEEE, and Calcutta section. The theme of the conference is a right choice. Open Discussion in the Recent Innovations in Electrical, Electronics & Communication Engineering are required to provide uninterrupted quality power supply to consumers and hence reducing pollution of the environment which includes quality living. Researchers across the Globe are taking up this type of research. I am happy that the School has taken up this research challenge by organizing this International Conference (ICRIEECE) at KIIT premises.

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I appreciate the efforts made by all the committee members of the conference in making the conference a success.

Prof. B.C.Guru
Advisor, Quality Assurance Cell
KIIT, Deemed to be University

From the Desk of Research Chair,
KIIT Deemed to be University



I am glad to know that KIIT School of Electrical Engineering is organizing an International Conference on “*Recent Innovation in Electrical Electronics & Communication Engineering (ICRIEECE)*” on 27th & 28th of July, 2018 at KIIT, Bhubaneswar in collaboration with IEEE, Calcutta section. I appreciate the efforts made by the School of Electrical Engineering and committee members for taking the challenge of organizing this International Conference (ICRIEECE) at KIIT premises.

I welcome all the participants to our campus for a fruitful participation, discussion and a comfortable stay during the conference. I am also glad to know that the researchers from different premier institutions across the globe have contributed their papers to the conference.

I am sure that the conference will provide a platform to faculty members, researchers, students and also to industry professionals for fruitful deliberations, exchange of ideas and to develop collaborations on the research theme.

I wish the conference a grand success.

Prof. Sudarshan Nanda
Prof of Eminence & Research Chair
KIIT, Deemed to be University

From the Desk of Organizing Chair (ICRIEECE-2018),
KIIT Deemed to be University



On Behalf of the IEEE conference organizing committee and School of Electrical Engineering, KIIT, Deemed to be University, I welcome you all to the International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering (ICRIEECE-2018) going to be held during 27-28 July, 2018 in School of Electrical Engineering, KIIT, and Deemed to be University Bhubaneswar.

As a premier conference in the field, ICRIEECE-2018 provides a highly competitive forum for reporting the latest developments in the research and application of Electrical, Electronics & Communication Engineering.

We want to express our gratitude to the members of the Program Committee and the external reviewers for their hard work in reviewing submissions. Also we are thankful to all the guest and keynote speaker for sharing their insight among the participants.

We thank all the authors for their contributions and their participation in ICRIEECE-2018 .We hope that this program will further stimulate research in Electrical, Electronics & Communication Engineering and provide practitioners with better techniques, algorithms, and tools for deployment.

We feel honored and privileged to serve the best recent developments in the field of Electrical, Electronics & Communication to you through this exciting program.

Organizing Chair (ICRIEECE-2018),
Prof. Chinmoy Kumar Panigrahi
Dean, School of Electrical Engineering
KIIT, Deemed to be University

From the Desk of Conference Chair, (ICRIEECE-2018),
KIIT Deemed to be University



I am glad that School of Electrical Engineering, KIIT Deemed to be University is organizing *International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering (ICRIEECE-2018)* during 27-28 July, 2018 in KIIT, Bhubaneswar. The theme of ICRIEECE focuses on a diverse range of research areas in electrical, electronics and communication engineering. In electrical engineering: major research areas are power converters, load flow analysis, FACTS controller, UPAC, HVDC systems, Advanced Power Semiconductor Devices, Drives, and Electromagnetic Compatibility etc. In electronics engineering: the major research areas are Parallel and Distributed Computing, Network Security, Image Processing, Cyber-physical Systems (CPSs), Radar and Microwaves, Cellular Networks, Advanced Adaptive Signal Processing etc. In communication engineering: the focused major research works: Fiber and Optical Communication Analog and Digital Communications, Antennas and Wave Propagation, Machine to Machine Communication, Radio Communication.

I hope this conference will provide a platform to the faculty members, researchers, Ph. D Scholars, M. Tech and B. Tech students and also industry professionals for acquiring knowledge over ongoing researches.

I, on behalf of the organizing committee, extend a very hearty welcome to all the participants and the invited speakers.

I appreciate all the committee members of the ICRIEECE in making a huge success.

Conference Chair

Prof. Sarat Chandra Swain

Associate Dean, School of Electrical Engineering

KIIT, Deemed to be University

From the Desk of Conference Chair
(ICRIEECE-2018),



I am happy to note our School of Electrical Engineering has heeded to the call today's world and in response, it is organizing a conference on *Recent Innovations in Electrical Electronics and Communication Engineering (ICRIEECE)* during 27-28 July, 2018 at University campus. In present scenario electricity and communication plays a vital role, hence the research and innovation in this field of engineering study has immense importance. I am sure it will attract scholars and young researchers to assemble and discuss on trends of research and innovations in different areas to meet the pressing needs for the clean, green and sustainable electricity generation and distribution.

I welcome all the participants for rigorous and fruitful participations in the conference, wishing them a happy visit to this clean, green and socially responsive campus.

I appreciate all the committee members of the ICRIEECE in making a huge success.

Wishing a great success to the Conference.

Conference Chair
Prof. Bhagabat Panda

From the Desk of Convener (ICRIEECE-2018),
KIIT Deemed to be University



On Behalf of the IEEE conference organizing committee and School of Electrical Engineering, KIIT, Deemed to be University, I extend a very warm welcome to all the delegates and participants to the *International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering (ICRIEECE-2018)* going to be held during 27-28 July, 2018 in School of Electrical Engineering, KIIT, and Deemed to be University Bhubaneswar.

Globalization, privatization and digitalization today have dramatically reshaped the education system in India and have created tremendous opportunities for internationalization, especially transnational or cross-border education. The Conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas face to face, to establish research relations and to find global partners for future collaboration.

I hope that you would/will enjoy some of the many attractions found in and around our beautiful campus KIIT, Deemed to be University. Such a large conference event is the culmination of many individuals. I thank the conference committee for extending their valuable time in organizing the program and all the authors, reviewers, and other contributors for their sparkling efforts and their belief in the excellence of ICRIEECE-2018.

Convener (ICRIEECE-2018),

Dr. Satyaranjan Jena

Assistant Professor, School of Electrical Engineering
KIIT, Deemed to be University

Message from the Director, CPGC: Dr. Siva Ganesh Malla

On behalf of the Organizing Committee of conference, I am delighted to welcome all the delegates and their guests to 'School of Electrical Engineering, Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar, India', for the "*International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering (ICRIEECE)*" which is held during 27th & 28th July 2018. This will give participants a platform to exchange their ideas, discover novel opportunities, reacquaint with colleagues, meet new friends, and broaden their knowledge. The theme of the ICRIEECE Conference is to provide the platform for Students, Engineers, Researchers and Scientists to share the knowledge and ideas in the recent trends in the field of Engineering, Science and Technology. The conference is approved by IEEE with conference record number: # 44171 along with copyright notice is 978-1-5386-5995-3/18/\$31.00 ©2018 Crown (Crown government: UK, Canada, and Australia) and for all other papers is 978-1-5386-5995-3/18/\$31.00 ©2018 IEEE.



ICRIEECE received huge number of quality papers and accepted few best papers among them. We received many papers from various countries in the world. Among accepted papers, we noted that 72 number of accepted papers from outside India. I wish good luck to all presenters and expecting future co-operation.

As a member in conference ICRIEECE-2018, I know that the success of the conference depends ultimately on the many people who have worked with us in planning and organizing both the technical program and supporting social arrangements. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

I am thankful to members in all the committees in the conference for their great efforts on this success. I am saying special thanks to members in KIIT, since KIIT members have provided their extreme support to conduct the conference in smooth manner. Special thanks to management of KIIT for providing this wonderful opportunity to involve me in this conference and organizing this as an unforgettable event.

Special thanks to all the sponsors of the conference and members of CPGC for their great support in organization of the conference. I am honorable to them for their kind support to me in each and every moment of this grand success.

Dr. Siva Ganesh Malla,
Director, CPGC groups

Prof. Ganapati Panda:
*School of Electrical Sciences,
Indian Institute of Technology (IIT) Bhubaneswar,
Bhubaneswar, India.*

Professor Ganapati Panda is currently working as a visiting professor at Indian Institute of Technology Bhubaneswar. During 2009-13 Professor Panda served as the Deputy Director of this institute. Prior to this he was working as Dean (Academic Affairs) and Head, School of Electrical sciences of this institute. He also served as Dean (Administration) at National Institute of Technology, Rourkela. He was a member of Board of Governors of IIT Bhubaneswar and NIT Rourkela. He was the founder Head of school of Electrical Sciences at IIT Bhubaneswar as well as the founder Head of Electronics and Communication Engineering department of NIT Rourkela. He also served as Director of National Institute of Technology, Jamshedpur. He also acted as Co-ordinator, World Bank Project at National Institute of Technology, Rourkela.



He has served 41 years in teaching and research in leading technical institutions of Odisha like College of Engineering Burla (16 years), National Institute of Technology, Rourkela (22 years) and Indian Institute of Technology, Bhubaneswar (4 years). He did his Post-Doctoral research work at the University of Edinburgh, UK (1984-86) and Ph. D. from IIT, Kharagpur in 1981 in the area of Electronics and Communication Engineering. He has already guided 35 Ph.Ds in the field of Signal Processing, Communication and Soft- computing. He has published more than 365 research papers in various referred International and Indian Journals and Conferences with 5661 citations, h-index of 38 and i-index of 104. Four more PhD students are continuing their PhD work under his active guidance. Most of his research papers are extensively cited.

He has successfully completed number of research projects from AICTE, MHRD, ISRO, DRDO, DST and British Council, UK. He has also edited two books in the area of DSP. He was nominated as the Fellow of the National Academy of Engineering, India (FNAE) and Fellow of National Academy of Science, India (FNASc) for his significant research contribution to signal processing and telecommunication. For the year 2012, Dr. Panda has been selected for the Biju Patnaik award for Scientific Excellence in recognition of his outstanding life time contributions in the field of science and technology. He also received Samanta Chandra Sekhar award from the department of Science and Technology, Govt. of Orissa for his high quality research work in the field of Engineering. He is a Senior Member of IEEE, Fellow of IET, Fellow of IETE, Fellow of IE, Life Member of CSI, Life Member of ISTE and Life Member of System Society.

He is a regular reviewer of many international journals including IEEE, IET and Elsevier. He has chaired and delivered keynote addresses in many international conferences in India and abroad. He has travelled extensively in India and abroad. His research interests are Digital Signal Processing, Digital Communication, Soft Computing, Intelligent Instrumentation, Evolutionary Computing, Computational Finance, Sensor Networks and Distributed Signal Processing.

Title of keynote: Recent Trends in Signal Processing, Communication and Optimization Techniques

Digital Signal Processing and Optimization Techniques play important roles in almost all fields of Engineering and management applications. These techniques have been extensively applied to

communication, power system, instrumentation and control. The talk will cover important contributions of adaptive, intelligent, robust and distributed signal processing tools. The talk will also deal with the applications of these tools to cognitive radio, compressing sensing, active noise control, hearing aids, biomedical engineering, sensor networks, smart grid, cognitive radio, image and speech processing and intelligent sensors. The new set of evolutionary computing based techniques play an important role in single and multi objective optimizations. These optimization techniques can be conveniently used for minimizing/ maximizing a number of variables. These techniques are suitable for multivariable, multi constraints and multi-objective optimization purpose. These are based on bio inspired techniques. In this talk few of these techniques will be covered and few interesting application areas will be dealt.

The talk will also include how these tools are applied for many interesting real life problems. In essence many interesting areas in the field of Electronics and Communication research will be covered and discussed.

Dr. Babita Majhi:

Babita Majhi did her Ph.D. degree in 2009 from National Institute of Technology Rourkela and Post Doctoral research work at the University of Sheffield, UK (Dec.2011-Dec. 2012).

She is presently working as a faculty in the department of Computer Science and Information Technology, G. G. University, a Central University, Bilaspur, India. She has guided 02 Ph.D. and 08 M. Tech. theses in the field of adaptive signal processing, bioinformatics, computational finance and Machine Learning. She has published 107 research papers in various referred International journals and conferences. Her total number of citations are 612 with h-index :12 and i10 index : 15.



She received the prestigious BOYSCAST Fellowship of DST, Govt. of India for pursuing postdoctoral work for the year 2010-11, and the best Ph. D. thesis award from IEEE NaBIC in 2009.

Her research interests are Adaptive Signal Processing, Machine Learning, Computational Finance, Distributed Signal Processing and Data Mining.

Title : Soft Computing Techniques for Efficient Prediction of Financial Time Series

Prediction of various time series such as exchange rate, interest rate, stock market plays an efficient role in finance and commercial sectors for decision making. The conventional methods provide poor prediction performance as most of these time series are nonlinear and non-stationary in nature. To alleviate this problem many soft computing based adaptive prediction methods have been proposed in the recent years. In this talk few of these non linear soft computing based predictor will be discussed and how these models are trained based on derivative as well as derivative free learning algorithms will also be dealt. The talk will also deal with feature extraction from time series, development as well as validation of the predictor models. Simulated results obtained using some real life data which demonstrate the superiority of new methods will also be presented during the talk.

In many practical situations time series data are contaminated with outliers. The outliers are observations that are distinct from the rest of the data. Depending on their locations in the time series these have moderate to severe effects on the performance of the adaptive prediction model. A learning machine is robust if it is least affected by the presence of outliers in the data.. When outliers are present in the past data, the conventional learning algorithms used in the adaptive model exhibit poor performance. Hence the talk will also focus on how to develop new robust forecasting models in presence of outliers.

Dr. P. K. Meher

Dr. P. K. Meher, Senior Research Scientist, School of Computer Engineering, Nanyang Technological University, Singapore, Senior scientist Institute for Infocomm Research, Chapter Chair, IEEE Circuits & Systems Society Chapter, Singapore. He was guided so many researchers and published more than 260 research articles which includes (Transactions, Books, journals, conferences). R. Parker Best Paper Award in the area of Signal Processing and the 2013 M.N.S. Swamy Award for being the best paper amongst all the papers published in 2012 and 2013.



Title: Analysis of Systolic Penalties and Design of Efficient Digit-Level Systolic-like Multiplier for Binary Extension Fields.

Systolic designs are considered as suitable candidate for high-speed VLSI realization for their inherent advantages of simplicity, regularity, modularity, and local interconnections. During the past few decades several systolic designs of finite field multipliers have been proposed in the literature. They are popularly used to achieve very high-throughput rate without any centralized control. But, all these designs incorporate heavy systolic penalties in terms of register complexity and latency of computation. We have analyzed here the hidden systolic penalties in those multipliers and proposed a digit-level systolic-like structure and a super-systolic-like structure for finite field multiplication. We have shown that the key issues to obtain such designs are the choice of design layout and digit size which substantially affect the register complexity, critical path, and latency. We have determined the optimal digit size and design layout to reduce the systolic penalties and at the same time to achieve lower critical path, higher-throughput rate, and lower latency with less register complexity with lower overall area complexity.

Prof. Raja Datta

Prof. Raja Datta is presently the Head of G. S. Sanyal School of Telecommunications at Indian Institute of Technology Kharagpur. He is also a Professor in the Department of Electronics and Electrical Communication Engineering (E & ECE) at IIT Kharagpur. Earlier he worked with North Eastern Regional Institute of Science and Technology, Itanagar, where he was also the Head of the Department of Computer Science and Engineering for several years.



Prof. Datta is a Senior Member of IEEE and has to his credit a number of publications in high impact factor Journals (that includes IEEE Transactions, IET, Elsevier, Springer, etc.) and Conferences. He has produced several PhDs and MS students in the area of Computer Communication Networks and Ad Hoc Networks apart from guiding numerous M. Tech and B. Tech projects. He is member of the editorial boards and reviewers of several International Journals and handles a number of projects funded by MHRD, DIT, ISRO, and Indian Railways. He is presently the Principal Coordinator of Train Ten Thousand Teachers (T10KT) Program under NMEICT at IIT Kharagpur. He has been consultants to several organizations including Defense Research and Development Organization (DRDO) of India and was also in the core committee for securing Indian National Museum, Kolkata. He has been associated with several Institutes and Universities as examiner, member of Academic Board, etc.

Prof. Datta was the Chairman of IEEE Kharagpur section in 2014. He was also the Secretary and ViceChair of IEEE Kharagpur Section in 2012 and 2013 respectively. Apart from organizing a lot of activities, the section also received the best small section award in Region 10 during his tenure as an office bearer.

His main research interests includes, but not limited to, Computer Communication Networks, Internet of Things, Delay Tolerant Networks, Mobile Ad-hoc and Sensor Networks, Optical Networks, Inter Planetary Networks, Computer Architecture, Distributed Operating Systems and Distributed Processing.

Title: "Eyes and Ears Everywhere"

The Internet of Things (IoT) is the network of physical objects—devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity—that enables these objects to collect and exchange data. It is like having eyes and ears in almost every places and devices as far as possible. In my lecture I'll talk about mainly two aspects that encompass a large part of IoT: namely Critical Area Surveillance and Structural Health Monitoring. Along with this I'll also try to touch upon the issue of Privacy Preservation while using technology in habitat monitoring using IoT. Critical area surveillance is one very important application that can be achieved by carefully designing the multimedia wireless sensor networks, which forms the skin of IoT here. In this world of continuous threat from multiple sources, fool proof surveillance has become very important in developed as well as developing countries. I'll talk about the coverage and cost modeling of the sensor nodes. One of the most important use of IoT is the structural health monitoring of tall buildings and bridges. In this talk I'll try to through light on the issues of bridge health monitoring that me and my

team here are involved in doing for Indian Railways for their bridges across India. Whenever there is the issue of monitoring of habitats in a place, there is always the problem of preserving their privacy. Therefore, I would like to end my talk discussing the major issue of privacy preservation in habitat monitoring.

Prof. Piotr Majdak

Prof. Piotr Majdak currently working in Polish-Japanese Academy of Information Technology in Warsaw, Poland, from the department of Computer Science His main research interests includes, but not limited to are computer graphics, artificial intelligence, bio- and nanotechnology.



Title: Remote monitoring of atmospheric pollution

Satellite monitoring systems can be used for remote monitoring of the atmosphere over a given area but they do not provide information on the state of pollution at a given time. Additional information could only be obtained after several days. Measurements from an aircraft may be obtained almost at real-time and in different geometries – vertical and horizontal. The future of this type of monitoring are remote-controlled unmanned aerial vehicles (airplanes, helicopters and balloons tethered), equipped with telemetric monitoring. The most appropriate monitoring devices placed on boards of outsize aircraft are lidars, due to their functionality (in terms of collecting pollution identification and assessing their distribution) and precision. They can be placed on patrolling, manned aeroplanes and choppers and outsize unmanned planes because of their (still) significant dimensions and weight, not to mention the structure complexity and price. It seems that on small unmanned aeroplanes and choppers thermographic and hyperspectral cameras with a very good resolving power and spatial resolution should be mounted. While developing the atmospheric pollution monitoring system for a given aircraft, uniform equipment should be utilized (in terms of its principle of operation, technology, manufacturing, etc). This would facilitate the design, construction and utilization of the monitoring system.

Index

S. No.	Title of The Paper	Pg. No.
1	Techno-Economic Feasibility of Wind-Solar Hybrid Systems for Rural Electrification of Sioure Village in Sahel <i>Nogoye Diaw, Lamine Thiaw, Oumar Ba, Thi Thi Soe, Swathi.A and G. Giridhar</i>	1
2	A Concentric Hexagonal Slot-loaded Circular-shaped Super Wideband Fractal Antenna <i>Srinivasarao Alluri and Nakkeeran Rangaswamy</i>	1
3	Reservation Based Resource Allocation with Dynamic Admission Probability for WSN-MCN Convergence Network <i>Anita Swain, Arun Kumar Ray and Prasanta Kumar Swain</i>	1
4	Automated Analysis of Scinti-Mammography based on Particle Swarm Optimization <i>Monalisa Bhattacharjee</i>	2
5	A Multi Valued Logic VHDL Package for Switch Level Simulation of Novel Digital CMOS Circuits <i>Péter Keresztes, Attila Tukacs and Miklós Török</i>	2
6	Design and Application of a Self-tuning based Feed- forward Control for a Non-minimum Phase System <i>Kajal Sharma and Raseswari Pradhan</i>	2
7	Speed Control of Sensorless BLDC Motor based on MFO Algorithm <i>Swati Swagatika and Nutan Saha</i>	3
8	Influence of Drain Doping Engineering in Triple Splitted-drain TFET Model <i>Disha Bhattacharjee, Bijoy Goswami, Dinesh Kumar Dash, Ayan Bhattacharya and Subir Kumar Sarkar</i>	3
9	Wide Band Filtenna with Inductively Loaded SRR for Ku-band Application <i>Soumya Ranjan Mishra and Sheeja K L</i>	3
10	Real Time Language Identification using Speech Signal <i>Sourav Padhee, Shreema Dash, Jaydeep Jena, Debashisa Samal and Susanta kumar Sarangi</i>	4
11	Power Sharing Strategy of Renewable Energy Sources in Microgrid Considering Economic Aspects <i>Kumari Kasturi, Chinmay Kumar Nayak and Manas Ranjan Nayak</i>	4
12	Design of A CPW Fed Wideband Patch Antenna for S-band Applications <i>Jyotibhusan Padhi, Madhulita Mohapatra and Subrat Kumar Panda</i>	4
13	Harmonic Minimization of Grid-connected Photovoltaic System using Sinusoidal Pulse Width Modulation <i>Mr. Suraj Kumar Panigrahi and Dr. Kanhu Charan Bhuyan</i>	4
14	Hierarchical and Partition based Clustering Techniques Comparison in Cloud Computing <i>Akankshya Aparajita, Shrabanee Swagatika and Debabrata Singh</i>	5
15	Dstar-Lite Routing Algorithm for Extending Wireless Sensor Networks Lifetime <i>Imad S. Alshawi</i>	5
16	Automatic Power Quality Events Recognition using Empirical Wavelet Transform and Random Forest Technique <i>Mrutyunjaya Sahani, Ranjan Keshri, Soumya Ranjan Mohapatra and Itibrata Senapati</i>	5
17	Model Predictive Control of a Double Input DC-DC Converter with Battery and PV Source <i>Dr. Lopamudra Mitra</i>	6
18	Allocating Loss with Network Reconfiguration in Radial Distribution Networks <i>Sivkumar Mishra and Ambika Prasad Hota</i>	6
19	Time Transfer in Wireless Media for Distant Device Synchronization through UHF Link <i>U.Mandal, R.R.Sahani, B. Biswas and H.K.Ratha</i>	6
20	Load Frequency control with PDPID Controller Including Double Derivative Filter <i>Priyambada Satapathy, Manoj Kumar Debnath, Nimai Charan Patel and Pradeep Kumar Mohanty</i>	7
21	Smart Wheel Chair for Differently Abled People using DTMF Control <i>Sanjeev Kumar Das and Dr. Lopamudra Mitra</i>	7
22	Moth Flame Optimization based Two-staged (PDF+IPI) Controller for Load Frequency Control <i>Tarakanta Jena, Manoj Kumar Debnath, Prateek Prasad Ray and Smaran Kumar Sanyal</i>	7
23	A Robust LSB Image Steganography Technique Using Chaotic Logistic Map <i>Md. Anwar Hussain and Popi Bora</i>	8

24	A Modified Watershed Transform for Brain Tumor Segmentation and Extraction of MR Images <i>J.Mehena and M.C. Adhikary</i>	8
25	Condition Monitoring and Overhauling of Electric Motor Driven Reciprocating Air Compressor for Better NVH <i>Chandrabhanu Malla, Saisubramanyam Pulugandla, Samarjit Swain and Isham Panigrahi</i>	8
26	Solution of LFC Problem using PD+PI Double Loop Controller Tuned by SCA <i>Nimai Charan Patel, Manoj Kumar Debnath, Binod Kumar Sahu and Pranati Das</i>	9
27	Fault Detection of Large Scale Wireless Sensor Networks using Six Sigma score <i>Sarthak Mohanty, Deepika Rani Sahu and Arunanshu Mahapatro</i>	9
28	Modified Array of Circular Patch Antenna for 5.9 GHz WLAN Application <i>Ribhu Abhusan Panda, Abhisekh Kumar Sharma and Mahesh kumar</i>	9
29	All-Optical Micro-ring resonator based optical XOR and XNOR logic gate <i>Rajiv Kumar, Niranjan Kumar, Poonam Singh and Ajay</i>	9
30	Brain Tumor Extraction using Optimal Gabor Wavelet and Otsu's Thresholding <i>Lingraj Dora, Sanjay Agrawal and Rutuparna Panda</i>	10
31	Development of Energy Efficient and Aquatic friendly Solar Electric Boat <i>Akhilesh Kumar Dewangan, Isham Panigrahi and R.K. Paramguru</i>	10
32	Simulation of Electrical Power Generation using Concentrated Photovoltaic Cell through Solar Parabolic Dish Concentrator <i>Susant Kumar Sahu, N.Sendhil Kumar and Pavankumar Hanamanthavarajula</i>	10
33	Whale Optimization Algorithm based Automatic Generation Control integrating DFIG for Two Area Power System <i>Ravi Shankar</i>	11
34	Grey Wolf Algorithm based Control Strategy for Load Frequency Control in Coordination with IPFC <i>Ravi Shankar</i>	11
35	Lion Algorithm based Load Frequency Control for Interconnected Power System in coordination with UPFC and Electric Vehicle <i>Ravi Shankar</i>	11
36	Volleyball Premier League based LFC and Comparative analysis of different Energy Storage System for Interconnected Power System <i>Ravi Shankar</i>	12
37	Overlapped Feature-Preserving Multiscale Error Diffusion for Digital Halftoning <i>Nihar Ranjan Panda and Ajit Kumar Sahoo</i>	12
38	Impact of Small AC Signal Superimposed on DC bias on the Performance of Nanoscale SON MOSFETs <i>Tapas Chakrabarti and Subir Kumar Sarkar</i>	12
39	Low Power Multiparameter Health Monitoring System: An Advanced Patient Diagnostic Approach <i>V.G.Girhepunje, Dr. Santosh D.Chede and N.S.Ambatka</i>	13
40	All-Optical Single Bit Magnitude Comparator using the Micro-Ring Resonator Structure <i>Rajiv Kumar, Niranjan Kumar, Poonam Singh and Ajay Kumar</i>	13
41	A Novel Framework for Early Prediction of Forest Fire using Internet of Things <i>Kamal Kumar Ghanshala, Rahul Chauhan and R.C Joshi</i>	13
42	Ear Localization and Validation Using Ear Candidate Set <i>Ayushi Rastogi, Koushendra Kumar Singh and B K Singh</i>	14
43	Steepest Descent Optimization based Adaptive Equalizers for Linear Time Invariant and Mobile Cellular Channels <i>SSNL Venkateswara Rao and Gottapu Sasibhushana Rao</i>	14
44	Electric Field Induced Enhancement of Multisubband Electron Mobility in Asymmetric V- shaped Double Quantum Well Structure <i>Sangeeta K Palo, Ajit K Panda, Trinath Sahu and Narayan Sahoo</i>	14
45	Classification of Faults in a Hybrid Power System using Neuro-Fuzzy Technique <i>Basanta K.Panigrahi, Bhagyashree Parija, Ruturaj Pattanayak, Abhipsa Kiran, Satamanyu Nayak and Prakash K.Ray</i>	15
46	Fault Localization in a Hybrid Power System using Impedance, Wavelet Transform and Travelling Wave Method <i>Basanta K.Panigrahi, Ruturaj Pattanayak, Bhagyashree Parija, Ritu Singh, Sourav K. Sahu and Pravat K. Rout</i>	15

47	GPS Position Correction using Differential Evolution Algorithm for Coastal region of Andhra Pradesh <i>G Sasibhushana Rao, Lavanya Bagadi and Nalineekumari Arasavali</i>	15
48	Online Condition Monitoring and Fault Analysis of Bearing of a Rotating Machinery using IoT <i>Sudarsan Sahoo, Chokka Upendra, Krishnananda Sahu and Nabajit Bharali</i>	16
49	Design a Feedback-loop Arbiter for on Chip Communication Architecture <i>Akhil Gupta and Abhinav Kumar</i>	16
50	Routing in Vanets for Freespace and Tworayground Propagation Lossmodels <i>T.Nishitha, Kankati Sai Anurag, Dr. T.Adilakshmi and Md Rahamath</i>	17
51	Double E-shaped Wideband Microstrip Patch Antenna for Wireless Applications <i>Pradosh Kumar Hota, Manoj Kumar Panda and Dr. Debasis Mishra</i>	17
52	Speech Recognition Model for Assamese Language using Deep Neural Network <i>Moirangthem Tiken Singh, Partha Pratim Barman and Rupjyoti Gogoi</i>	17
53	Line Formation by Swarm Robots <i>Arijit Sil, Sruti Gan Chaudhuri and Shankha Bhattacharya</i>	17
54	Facial Emotion Detection using Deep AutoEncoders <i>Siva Prasad Raju Bairaju, Sowmya Ari and Prof Rama Murthy Garimella</i>	18
55	Novel Microstrip Patch Antenna for WLAN and WiMAX Applications <i>P. Sanyal, M. Singha Roy P. P. Paul and S. Moitra</i>	18
56	An Improved HAPO Algorithm using GPU Harness (IHAPO-G) for Rapid Responses in VANETs <i>Vinita Jindal and Punam Bedi</i>	18
57	Power Quality Improvement in Microgrid with Renewable Energy Resources <i>Parth D. Patel and Nilay N. Shah</i>	19
58	Industrial Surveillance Video Analysis using Compressed Sensing <i>Unnikrishnan K T and Dr Byjubai T P</i>	19
59	Advanced Embedded System for Identification of Asthma <i>Nitin S. Ambatkar, Dr. S. D. Chede and Vyankateshwar G. Girhepunje</i>	19
60	Biosensor Mobile Node Network: New Technology to Enhance Agriculture Crop Productivity <i>Virendra K. Taksande, Vyankateshwar G. Girhepunje and Manoj K.Demde</i>	20
61	Automatic Irrigation and Soil Quality Testing <i>G Nithin Reddy, Mohammad Danish, Yadala Syam Babu and Dr. G Koperundevi</i>	20
62	Testing and Diagnosis Faults in Finfet Circuits based on Advanced Test Algorithm <i>K.V.B.V.Rayudu, Dr P Srihari Rao and Dr. K S R Krishna Prasad</i>	20
63	Congestion Management of Power Transmission lines: A Survey on Techniques, Methodology and Approaches <i>Sourabh and Dr. Gagandeep Kaur</i>	21
64	Use of the PMU Infrastructure to Determine the Location of Short-circuit Power Lines <i>Konstantin Suslov, Nadezhda Buryanina and Elena Lesnykh</i>	21
65	Design of PID Controller for Load Frequency Control of One Area and Two Area System using Firefly Algorithm <i>Neelesh kumar gupta, kasi reddy idamakant and Arun kumar singh</i>	21
66	Comparative Analysis of Various Phasor Estimation Techniques used in Transmission Line <i>Aniket Hattarge and Uday Sarode</i>	22
67	Rate Distortion Optimization using Edge based Quad Tree with Threshold on Edges for video coding <i>Rajender Kumar, Dr Amit Kant Pandit and Krishan Kumar</i>	22
68	A Review on Fault Tolerant Control in Benchmark Challenge of Wind Energy Conversion <i>Shrabani Sahu and Sasmita Behera</i>	22
69	A Genetic Algorithm based Parameter Extraction Method for a PV Module <i>Raseswari Pradhan and Abhipsa Kiran</i>	23
70	RCP Prediction in Cellular Networks using Normalized Percentile Dwell Time <i>Prateek, Swati Swayamsiddha, Sudhansu Sekhar Singh</i>	23

71	Three-phase Induction Motor Performance on One Coil Short in Stator Winding: - Modelling and Simulation	23
	<i>Sharad S. Dhamal and Dr. M. V. Bhatkar</i>	
72	Implementation of Multiple Slots Patch Antenna Array with using Quarter wave Feed Network for WLAN Applications	24
	<i>Dr.D.Prabhakar, P.Santosh, Dr. M.Satyanarayana and Dr. P. Mallikarjuna Rao</i>	
73	Improved Topical and Trust based Page Ranking for Web pages using Trust Features	24
	<i>L.Smitha and Dr.S.Sameen Fatima</i>	
74	Applied Communication Technology to Support Tourism Web Collaboration at Provincial Level in Indonesia	24
	<i>Sulistyo Heripracoyo and Suroto Adi</i>	
75	Ortho rectification of Resourcesat-2 AWiFS Data using FFT Phase Correlation Technique	25
	<i>M Suresh Kumar, R N Anjani, Ch Venkateswara Rao and B Gopala Krishna</i>	
76	NS3TCG: NS3 Topology and Code Generator	25
	<i>Rishav Halder, Sridhar Mundra, Uttaran Dey, Sreejita Ghosh, Sreeja Karmakar and Raja Karmakar</i>	
77	Prognosis of Liver Disease: Using Machine Learning Algorithms	25
	<i>Vyshali J Gogi and Dr. Vijayalakshmi M.N</i>	
78	SSR Mitigation with Damping Controller using STATCOM	26
	<i>Sangeeta Samantara</i>	
79	Processing of Silicon Heterojunction Solar Cell and its Secondary Ion Mass Spectrometric Characterization	26
	<i>M. S. Siddiqui, Vinayan Bhardwaj, A. K. Saxena, S. P. Singh</i>	
80	Review on Fetal Heart Rate Variability	26
	<i>Dr.M.Malini, A.Usha Sri and G.Chandana</i>	
81	An Efficient Radial Basis Functional Network Optimised by Firefly Algorithm for Stock Market Forecasting	26
	<i>Ajaya Kumar Parida, Sthita Prajna Mishra and Nirupama Parida</i>	
82	A Deep Learning Approach for prediction of Software Defects using Principle Component Analysis & Neuro Fuzzy Inference System	27
	<i>Satya Srinivas Maddipati and M Srinivas Rao</i>	
83	Comparative Study of Different PWM Techniques used for Five-level Cascaded H- bridge Inverter based DSTATCOM	27
	<i>V.ChandraSekhar and K.Krishnaveni</i>	
84	A Novel Approach for Data Classification using Neural Network	27
	<i>Debasis Gountia, Suendra Kumar Jayasingh, Ranjita Champati, Prakash Kumar Chinara, Ashish Kumar Pradhan and Neelamani Samal</i>	
85	Performance Analysis of P-V and Q-F Droop Control Strategy in an Islanded Resistive Microgrid During Partial Shading on Photovoltaic Plant	28
	<i>Binoy Kumar Karmakar and Ashok Kumar Pradhan</i>	
86	Passive Filter Design to Mitigate Harmonics in Three Phase Uncontrolled Rectifier	28
	<i>Wategaonkar Suraj S., Patil Swapnil S., Pradnya R. Jadhav</i>	
87	Hardware Implementation of Cascaded H-bridge 5-level Inverter using SPWM Techniques	28
	<i>Patil Swapnil Sanjay, Patil Rupali Tanaji and Prof. Patil S. K.</i>	
88	Microcontroller based Sinusoidal PWM of 2-Level 3-Phase Voltage Source Inverter	29
	<i>Gurav Rutuja D., Morey Suryakant B. and Dr. P. M. Joshi</i>	

89	Microcontroller based Implementation of Three Phase Two Level Voltage Source Inverter using Space Vector Modulation Scheme	29
	<i>Suryakant Morey, Rutuja Gurav and Dr. Prasad. M. Joshi</i>	
90	Narration of the Revolution of Humanoid Robot	29
	<i>Md Nasfikur R. Khan, Faisal Bin Shahin, A Muneem Al Hasani, Anik Shekar Dutta, S K Adif Farhan and Kuraish Bin Quader Chowdhury</i>	
91	Comparative Analysis of Conventional and Modified H- bridge Inverter Configuration	30
	<i>Chithaj Mallikarjun, Niteesh S. Shanbog and Sangeeta Modi</i>	
92	Web Service Discovery Approaches of Semantic Web- A Review	30
	<i>Ajay Kumar, Dr. Naresh Chauhan, Dr. Jyoti</i>	
93	OFDM and VSC-OFDM Systems	30
	<i>Mr. Sidramayya S M and Dr. Ramesha K</i>	
94	Modeling, Analysis and Simulation of Two-level and Three-level Voltage Source Converter for HVDC System	31
	<i>G. Surendhar, K. Krishnaveni and B. P. Muni</i>	
95	Performance of MIMO Systems using Maximal Ratio Combining over Weibull Fading Channel	31
	<i>Shaik Mahammad Shakeer and D.Lalitha Kumari</i>	
96	Design of Enhanced PID Controller using Improved Cuckoo Search Algorithm	31
	<i>Amit Mondal, Sudipa Dutta, Trisha Ganguly, Megha Chatterjee and Shayak Ghosal</i>	
97	Multi-Level Security Victimization QR Code, Bioscience and Positive Identification for Security Systems	32
	<i>Shubham Yadav, Manish Verma, Manish Kurre and Assistant Professor</i>	
98	An Adoptive Approach for Design Strategies and Simulation of Wireless Adhoc Communication Network	32
	<i>Pravin P Ashtankar, Dr.Sanjay S.Dorle and Sonali N.Dhurvey</i>	
99	IoT Enabled Security System for Android Users	33
	<i>Sulochana Roy</i>	
100	Highly Nonlinear and Ultra High Birefringent Index Guiding Photonic Crystal Fiber: An Improved Design	33
	<i>Fahim Ahmed, Probir Kumar, Md. Abdul Hakim, Md. Nahid, Md. Sabuj Miah, Shovasis Kumar Biswas</i>	
101	Extremely High Nonlinearity and Large Negative Dispersion Compensating Photonic Crystal Fiber using All Circular Air Holes for Fiber Optic Transmission System	33
	<i>S. M. Rakibul Islam, Md. Rubayet Islam, Md. Tawhid Islam Opu, Mashfiq Ahmed, Hafiz-Al-Wasif and Shovasis Kumar Biswas</i>	
102	Identification of Most Suitable Zone for SVC in Power System Network	34
	<i>Mayuree Shegaonkar, Mrityunjay Gupta, Sourav Das and Parimal Acharjee</i>	
103	Post-processing Noise of ZF Detector with Varying Channel Condition	34
	<i>Amlan deep Borah and Joyatri Bora</i>	
104	Application of Grasshoppers Optimization Algorithm for Automatic Generation Control of Multi-area Power System	34
	<i>Barunesh Behera</i>	
105	Silica Based Highly Nonlinear Dispersion Compensating Photonic Crystal Fiber	35
	<i>Tauhid Anwar, Sanjida Akter Mow, Eshrat Jahan Esha, Asma Islam, Abdullah Al Noman and Shovasis Kumar Biswas</i>	
106	Enhancement of Throughput for Cellular Data Network by Small Cell Deployment	35
	<i>Janmoni Borah, Md. Anwar Hussain and Joyatri Bora</i>	

107	Performance Analysis of Precoding Techniques in Cellular Network	35
	<i>Amlan deep Borah, Md. Anwar Hussain, Joyatri Bora</i>	
108	A Comprehensive Review of Mobile Crowdsensing	36
	<i>Kuldeep Jha and Niranjana Ray</i>	
109	Development of Advanced ATM Surveillance and Security System	36
	<i>Avinash Deshpande, Balwant K. Patil, Sateesh N. Dodamani and Rudresh B. Magadam</i>	
110	Synchronous Electric Machines with Tooth-coil Winding and Magnetic Flow Barrier	36
	<i>Flur R. Ismagilov, Viacheslav E. Vavilov and Denis V. Gusakov</i>	
111	A survey and Analysis of Techniques to Diagnose COPD	37
	<i>Ms.Shaila H Koppad, Dr. S Anupama Kumar and Dr. K.N. Mohan Rao</i>	
112	Hand Written Indian Numeral Character Recognition using Deep Learning Approaches	37
	<i>Sivaanandh M, S.Surya and G.Priyanka</i>	
113	Design of Fuzzy PI Controller Optimized with Crow Search Algorithm of an Interconnected AGC	37
	<i>Aditya Kumar Nanda and Dr.Ramesh Chandra Prusty</i>	
114	Transient Response of DFIG Fractional Order Model Connected in Standalone Mode	38
	<i>A.Ravi Shankar and Dr.T.R.Jyothisna</i>	
115	Ultrahigh Birefringence Hexagonal Photonic Crystal Fiber with High Nonlinearity using All Circular Air Holes	38
	<i>Nuzhat Nawshin, Khan Farhan Ibne Faruque, Md. Abdul Hakim, Md. Sabuj Miah, Mehedi Hasan Khan and Shovasis Kumar Biswas</i>	
116	Harmonic Mitigation in Three Phase Three Wire System using Shunt Active Power Filter	38
	<i>Rajeev Lakra, Idamakanti Kasireddy and Arun Kumar Singh</i>	
117	A Survey on Recent Approaches for Big Data Analysis	38
	<i>Pravin S Game, Dr. Vinod Vaze and Dr. Emmanuel M.</i>	
118	Smith Predictor Implementation of a High Dead Time Interacting Tank Process	39
	<i>Dr. S. Meenatchi Sundaram and Dr. P. R. Venkateswaran</i>	
119	Improving Voltage Profile of Renewable Energy Sources using Multiple Energy Storage Systems	39
	<i>Avinash Deshpande and Mrityunjaya Kappali</i>	
120	Brain Tumor Detection and Segmentation from FLAIR, T1C and T2 Weighted MR Images	39
	<i>Sanjay Saxena</i>	
121	Comparison of Body Temperature and Heartbeat between Male and Female using Arduino	40
	<i>Manjulata Sahu, Mithilesh Atulkar and Mitul Kumar Ahirwal</i>	
122	New Principles of Algorithm of Current Protection based on Three Instantaneous-value Samples	40
	<i>Nadezhda Buryanina Yuriy Korolyuk, Elena Lesnykh and Konstantin Suslov</i>	
123	Comparative Analysis between Conventional PID and Fuzzy Logic Controller for UPQC in DFIG based WECS Integrated to Grid	40
	<i>M. Rama Sekhar Reddy and Dr.M.Vijaya Kumar</i>	
124	Lung Cancer Detection using CT Scan with Artificial Neural Network	41
	<i>Loveneet Kaur, Manmohan Sharma, Rajan Dharwal and Aditya Bakshi</i>	
125	Computational and Statistical Analysis of Heart Disease Prediction	41
	<i>Heena Farheen Ansari and Dr. Varsha Namdeo</i>	
126	Analysis of the Cloud Computing Architecture for the Better Security	41
	<i>Dr.K.SAI MANOJ, K. MRUDULA, Mrs. G.Maanasa and K.Phani Srinivas</i>	

127	Design and Analysis of Low Power, High Speed 4 - bit Magnitude Comparator	41
	<i>Pranay Singh and Pramod Kumar Jain</i>	
128	Pin Fins Heat Sink Geometries for Electronic Packaging using Forced Convection	42
	<i>V Manoj Kumar and B Nageswara Rao</i>	
129	DSP-based Power Quality Events Detection and Classification using Hilbert-Huan Transform and Random Forest Technique	42
	<i>Mrutyunjaya Sahani, Arpita Mishra, Nishant Patra and G Bharat Gourav</i>	
130	Modeling and Simulation of Multijunction Solar or Sun based Cell	43
	<i>Sudhir Kumar Tripathi, Stuti Chakraborty, Dr k. Namrata and Prof.Arun Kumar Singh</i>	
131	CNN for Butterfly Classification	43
	<i>Debani Prasad Mishra, Tanmay Kumar Tripathy and Stuti Chakraborty</i>	
132	IoT for Healthcare	43
	<i>Debani Prasad Mishra, Tanmay Kumar Tripathy and Stuti Chakraborty</i>	
133	Voltage Regulation of PV Cell using PID Controller	43
	<i>Debani Prasad Mishra, Stuti Chakraborty and Tanmay Kumar Tripathy</i>	
134	PI and Predictive Torque Control Techniques for Controlling Power and Torque Generated from Wind Turbine based on DFIG	44
	<i>Asit Kumar Panda and Dr. Chandrabhanu Mishra</i>	
135	Analytical Study of SEP & M-SEP in Wireless Sensor Network with Heterogeneous Platform	44
	<i>Debabrata Singh, Shrabanee Swagatika, Nibedita Jagdev, Mitrabinda Khuntia, Rahul Kumar Ankit and Arup Kumar Mohanty</i>	
136	Internet of Things based Low-cost Weather Data-logger and Automatic Alert System	44
	<i>Murchhana Islam and Sayantani Datta</i>	
137	Loss Allocation Schemes in Power Distribution Networks-A Bibliographic Review	45
	<i>Sivkumar Mishra and Ambika Prasad Hota</i>	
138	Assessment of Power Quality Events by EMD based HILBERT Transform and S-Transform using Different Classifiers	45
	<i>Sushil Kumar Jena, Papiya Ray and Manish Kumar Babu</i>	
139	Privacy Preservation and Security Dilemma Relationship Proposition for IoT Authentication	45
	<i>Atlee M. Gamundani, Amelia Phillips and Hippolyte N. Muying</i>	
140	Application of Empirical Mode Decomposition and Support Vector Machine based Algorithm for the Classification of Arc Fault in Distribution Line	46
	<i>Himadri Lala and Subrata Karmakar</i>	
141	Effect of Gate Engineering and Misalignment on the RF Performance of DG HFET	46
	<i>Samparna Parida and Monalisha Mishra</i>	
142	Product Usability and Capability Evaluation using Modified BAT-ARM Algorithm to Alleviate Feature Fatigue	46
	<i>Divya and Midhunchakkaravarthy</i>	
143	Microstrip Patch Antenna Design using Fractal Slot Geometries for Multiband & Wideband Applications	47
	<i>Manas Ranjan Jena, Guru Prasad Mishra and B.B.Mangaraj</i>	
144	Remote Monitoring of Atmospheric Pollution	47
	<i>Augustyn Chwaleba and Piotr Majdak</i>	

145	An ASIC Implementation of Successive Cancellation Decoder with Built-In Scan Chain <i>Lakshmi Manasa Sistla and LakshmiNarayanan G</i>	47
146	Application of Flower Pollination Optimization for MPPT Controller of a Standalone Photovoltaic System <i>Jugajyoti Sahu and Niranjan Nayak</i>	47
147	A Region based Optimal Multifocus Image Fusion Scheme <i>Bikash Meher, S. Agrawal and Pranaba K. Mishro</i>	48
148	Genetic Algorithm based Comparative Study of Stability Gain in Wind Energy Conversion System <i>Manjushree Diptimayee Patra, Bibhu Prasad Ganthia, Laxmipriya Biswal and Sanjib Kumar Majhi</i>	48
149	Performance Comparison of BPSK, QPSK and 16-QAM Modulation Schemes in OFDM System using Reed-Solomon Codes <i>Simarjeet Kaur, Navdeep Singh, Gagandeep Kaur and Jasbir Singh</i>	48
150	An Optimized Robust FOPID Controller for Stability in Unstable System <i>Deep Mukherjee, Palash Kumar Kundu and Apurba Ghosh</i>	49
151	Protection Scheme based on Fault Detection and Fault Classification using Fuzzy Inference System in IEEE-9 Bus System <i>Aditya Patel, M.V.S. Prashant, Jharna Sahu and Ancy Prerena Kujur</i>	49
152	Automation of Image Classification to Identify Malaria <i>Alan Shona Saldanha, Ankitha B, Raju K and Ranjan Kumar H S</i>	49
153	Power Quality Improvement using FLC based UPQC <i>Pratik Das, Samikshya Mishra and Santanu Sen</i>	50
154	PS-DCT Image Functioned Framework for Steganography <i>Dr. Pallavi Khare, Dr. M. Sushanth Babu and Dr. Akhil Khare</i>	50
155	Optimization based Tuning of Fractional PID Controller for Small Hydro Power Plant <i>Himanshi Verma, K. Dhananjay Rao and Subhojit Ghosh</i>	50
156	Potential use of Passive Microwave Remote Sensing in Flood Prediction: A Case Study in Morigaon District of Assam, India <i>Bikramjit Goswami and Manoranjan Kalita</i>	51
157	Design and Implementation of Low Cost Low Loss Energy Quality Regulator for Energy Distribution Systems <i>Ahmet Eren and Ahmet Mete Vural</i>	51
158	Digital Image Correlation Techniques for Experimental Strain Analysis: A Review <i>Nutan Shukla and Manoj Kumar Mishra</i>	51
159	Common Mode Voltage (CMV) in Three Level NPC VSI using Advanced Bus Clamping Methods:A Study <i>Partha sarathi Behera, G. Vivek and Dr. Mukti Barai</i>	52
160	Unconventional Method of Accessing Bitmap Image Files with Missing Header <i>K. Srinivas and Dr. T. Venugopal</i>	52
161	Spatial Estimation of Signals in Non-Overlapping Time for ULA Antenna based Six User DS-CDMA <i>Amiya Dey and Arnab Nandi</i>	52
162	Cost Effective Food Quality Monitoring using PLC: An Optimized Approach <i>Ayesha Kesharia, Pooja More, Komal Adeshra and Rajendra Sutar</i>	53
163	Synchronization Technique for Grid Connected PV Source using d-q Reference Frame Control <i>Vinay Janardhan Shetty, Dr. S.G.Ankaliki, Rudresh Magadum and Pooja J Shetty</i>	53

164	Selfish Avoidance Payoff Allocation in Mobile Ad Hoc Network	53
	<i>Moirangthem Tiken Singh and Surajit Borkotokey</i>	
165	Comparison of ANFIS and ANN Techniques in Fault Classification and Location in Long Transmission Lines	54
	<i>S. Panda, D. P. Mishra and S. N. Dash</i>	
166	Modelling & Simulation of PV System with Fuzzy MPPT based Converter	54
	<i>Jyotirmayee Priyadarshini</i>	
167	Audio Fingerprinting with Higher Matching Depth at Reduced Computational Complexity	54
	<i>V Kamesh, Nagarjuna Pampana, Mohit Sinha and Shuvabrata Bandopadhaya</i>	
168	Applied Communication Technology to Support Tourism Web Collaboration at Provincial Level in Indonesia	55
	<i>Sulistyo Heripracoyo and Suroto Adi</i>	
169	Impact of Fault Location on Sub-Synchronous Resonance in Series Compensated Type 3 Wind Power Plant	55
	<i>Gajanan V. Gotmare and Dr. Vasudeo B. Virulkar</i>	
170	Optimal Planning and Operation of Microgrid: A Comprehensive Review	55
	<i>Nalini Telu, R Gowrisankar Rao and V S Vakula</i>	
171	A SFS Tuned Fuzzy PI Controller for a Hybrid Power System with Electric Vehicles	56
	<i>Sasmita Padhy, Rajendra Ku. Khadanga and Sidhartha Panda</i>	
172	An FOPI Controller Design for Coupled-Tank TITO Process using Whale Optimization Algorithm	56
	<i>Gandikota Gurumurthy, Dushmanta Kumar Das and Abhishek Srivastava</i>	
173	Design of Cost-efficient Fuel Cell using Domestic Waste and Cowdung and Investigation of Accurate Mixture Ratio for Efficient Output	56
	<i>Tuhinanshu Mishra, Swapnil Srivastava and Abdul Zeeshan</i>	
174	A Fractional Order PI (FOPI) Controller Design for Shunt Active Power Filter to Improve the Power Quality	57
	<i>Abhishek Srivastava, Dushmanta Kumar Das and Gandikota Gurumurthy</i>	
175	A Secured Patients Monitoring System using Sensor Nodes in Health Care Institutions	57
	<i>Pabitra Mohan Khilar, Swasti Sadhan Khatua and Rakesh Ranjan Swain</i>	
176	Design and Implementation of an Internet of Things based Prototype for Smart Home Automation System	57
	<i>Kshirod Kumar Rout, Samuchita Mallick and Sivkumar Mishra</i>	
177	Review of Speech Enhancement Methods for Real-time Speech Signals	58
	<i>Alaka Pradhan, Susanta Kumar Sarangi, Kanhu Charan Bhuyan and Subhashree Priyadarshini</i>	
178	Detection of Speech under Psychological Stress During Exam	58
	<i>Bhagyalaxmi Jena, Anket Biswal and Sudhansu Sekhar Singh</i>	
179	A Comparative Analysis of Different Topologies of an Eleven Level Inverter for Solar Power Applications	58
	<i>Kshirod Kumar Rout, Abinash Tripathy, Onkar Sahu and Sivkumar Mishra</i>	
180	Designing and Sizing of a Standalone Photo Voltaic System: A Case Study	58
	<i>Kshirod Kumar Rout, Ansuman Das and Sivkumar Mishra</i>	
181	Comparative Analysis of Clustering Techniques in Cloud for Effective Load Balancing	59
	<i>Akankshya Aparajita, Shrabanee Swagatika and Debabrata Singh</i>	

182	Design and Simulation of a Standalone Photo Voltaic System using Synchronous Boost Converter and Reduced Switch Five Level Inverter	59
	<i>Kshirod Kumar Rout, Kalyan Srinivas and Sivkumar Mishra</i>	
183	Location of Fault on Transmission Line using Impedance and Travelling Wave based Method	59
	<i>Basanta K.Panigrahi, Bhagyashree Parija, Ruturaj Pattanayak and Pravat K. Rout</i>	
184	Double Priority based Load Balancing Algorithm for Cloud Computing	60
	<i>Sangeeta and Suman</i>	
185	Online Food Review Quantification based on Dynamic Sentence Evaluation	60
	<i>Muhammad Usama Islam, Mafuza Akter, Sarna Mukta and Abdul Alim</i>	
186	Relative Study of Routing Protocols in Diverse Topologies using NS2 Simulator	60
	<i>Prasant Kumar Dash and Madhumita Panda</i>	
187	Simulation and Fabrication of 27-level PV Inverter	61
	<i>Aman Deep Masih, Aravapalli Avinash and A. Immanuel Selvakumar</i>	
188	Multibeam Generation using Optimization Techniques	61
	<i>R. Krishna Chaitanya, Dr.P.Mallikarjuna Rao, Dr.K.V.S.N.Raju and Dr.G.S.N. Raju</i>	
189	Isolated DC-DC Converter with Secondary Side Phase Shifting	61
	<i>J.Sivavara Prasad, G.Nageswara Rao, K.R.L.Prasad</i>	
190	Simulation of Indirect Field Oriented Control of Induction Motor Drives using SMO based MRAS by ANFIS Controller	61
	<i>M.Ankarao, M.Vijaya Kumar and Shaik Asiya Sulthana</i>	
191	Design and Simulation of a Modified MOSFET Having a Doped Pocket Region in the Substrate	62
	<i>Prasenjit Saha and Bijoy Goswami and Subir Kumar Sarkar</i>	
192	Modeling and Performance Analysis of Wind-SPV Hybrid Renewable Energy System Integrated to Grid	62
	<i>Abhisek Gantayat, Kamal Kant and Dr. Santi Behera</i>	
193	Design of Evaluation Board for Image Processing ASIC and VHDL Implementation of FPGA Interface	62
	<i>Chaitra M, Dr Aravind H S, Anantha Shayanam G R and Harish Bohara</i>	
194	A Smart Incubation System	63
	<i>Arijit Ghosh, Lina Mondal and Somadrita Chattopadhyay</i>	
195	Use of Particle Swarm Optimization for Feature Selection and Data Mining Methods for Efficient Detection of Automobile Insurance Fraud	63
	<i>Anmol Pattanaik and Suvasini Panigrahi</i>	
196	Health Guardian - A Subsidiary Android Application for Maintaining Sound Health	63
	<i>Md. Nasfikur R. Khan, W. Faarhin Durdana, Robin Roy, Gobinda Poddar, Sabrina Ferdous and A K Ehsanul Haque Mashuk</i>	
197	Remote Health Monitoring of Transformer using Internet of Things	64
	<i>Baldeep Singh Nagi, Swarupa Mishra and Gagandeep Kaur</i>	
198	Electromagnetic Properties of Vanadium Pentoxide and Sodium Silicate Added Lithium Ferrite Sintered at Different Temperatures	64
	<i>Jangkhohao Touthang and Mamata Maisnam</i>	
199	Effect of Vanadium Pentoxide Layer in the Photovoltaic Properties of Dye Sensitized Solar Cell	64
	<i>Arya Vasanth, C.O.Sreekala, Jinchu.I and K.S.Sreelatha</i>	

200	Dynamic Performance Analysis of Double fed Induction Generator using Adaptive Neuro-Fuzzy Interference system in Microgrid <i>Sri Krishna Kumar.S and P.K.Dhal</i>	65
201	Cloud based Global Telemetry System for Physiological Signal Monitoring <i>Vyankateshwar G. Girhepunje, Dr.Virendra K.Taksande and Sonal R. Chakole</i>	65
202	A Novel Ultrathin Pixelated Wideband Metamaterial Absorber using Wind Driven Optimization Algorithm <i>Prakash Ranjan, Arvind Choubey, Santosh Kumar Mahto, Rashmi Sinha and Chetan Barde</i>	65
203	A Novel Implementation of PFC Converter using PCCM Boost Technique <i>Ramya S Rajan, Kiran R and Rajath G R</i>	66
204	Optimal Placement Technique for PMUs during Contingency & Analysis of PMU Signal for a Detection of Disturbance in a Power system <i>Kiran R, Dr. B.R. Lakshmikantha and Usha S</i>	66
205	Energy Harvesting of Piezoelectric with Synchronized Switch Harvesting on Inductor <i>Vishnu Sidharthan P, M. Udaya Bhasker, Srikanth Korla and M S Chandrasekhar</i>	66
206	A Survey on Passive, Active and Semiactive Automotive Suspension Systems and Analyzing Tradeoffs in Design of Suspension Systems <i>Sanjay S Eligar and R M Banakar</i>	67
207	Significant Bit Contribution in Robust Feature Extraction for Dermoscopic Image Classification <i>Rik Das, Saurav Ghosh, Sunirmal Khatua, Aritra Sen, Sudeep Thepade and Mahua Banerjee</i>	67
208	Investigation of Metamaterial and its Design Approaches <i>V. Koushick and C. Divya</i>	68
209	Overlapped Feature-preserving Multiscale Error Diffusion for Digital Halftoning <i>Nihar Ranjan Panda and Ajit Kumar Sahoo</i>	68
210	Application of SOS based PDPID Cascaded Controller with Double Derivative Filter for AGC of Interconnected Power System <i>Subhadra Sahoo, Geetanjali Dei, Nimai Charan Patel and Binod Kumar Sahu</i>	68
211	Energy Efficient Green Mobile Communications in India by 2020 <i>Babji Prasad Chapa, Sasibhushana Rao Gottapu and Vinod Kumar Mogadala</i>	68
212	Integrated Energy Management of Photovoltaic Panels and Fuel Cells for Residential Houses <i>Raghava Nirati, Kuo-Wu Chien, Zolboo Damiran and Leehter Yao</i>	69
213	Analytical Study & Implementation of Web Performance Testing Tools <i>Divya Saharan, Yogesh Kumar and Dr. Rahul Rishi</i>	69
214	Vibration Signature Analysis for Broken Rotor bar Detection in an Induction Motor <i>Prashant Kumar and Ananda Shankar Hati</i>	69
215	Security in Opportunistic Sensor Network and IoT having Sensors using Light Weight Key Generation and Cryptographic Algorithm <i>Mohammed Salman Arafath, K.V.N. Sunitha and Khaleel Ur Rahman Khan</i>	70
216	Performance Analysis of PV fed Boost Converter using a Linear and Non-linear Control Approach: PI and Sliding Mode Control <i>Nivedita Pati, Babita Panda and Bhagabat Panda</i>	70
217	Line to Ground Faults Protection and Control method in Active Distribution Network using IEC 61850 <i>A David Arulanandan</i>	70
218	Power Loss Reduction & Enhancement of Power Transfer Capability with STATCOM & TCSC using	71

Sensitivity Analysis

Md. Aftab Alam, Shobhan Banerjee, Krishnatreya Bhattacharya and C.K. Panigrahi

219	Performance Analysis of Adaptive Filters based on Robust Second Order Generalized Integrator under Adverse Grid Condition	71
	<i>Banishree Misra and Byamakesh Nayak</i>	
220	Performance Analysis of ALO Tuned FOPID Controller for AGC of A Three Area Power System	71
	<i>Geetanjali Dei, Subhadra Sahoo and Binod Kumar Sahu</i>	
221	Performance Analysis of Three Phase Passive Harmonic Filters for HVDC Installations	72
	<i>Banishree Misra and Byamakesh Nayak</i>	
222	Symmetrical and Asymmetrical Conventional Cascaded Multilevel Inverter with SPWM Technique	72
	<i>Lipika Nanda and Dr. U. K. Rout</i>	
223	Load Frequency Control of MSMA Hydro Thermal System using Tuned PI Controller	72
	<i>Anurekha Nayak and Manoj kumar Maharana</i>	
224	Grid Connected PV/Wind/Fuel Cell Hybrid Renewable Energy System using Droop Controller for Curtailment of Circulating Current	73
	<i>Debayani Mishra and Manoj Kumar Maharana</i>	
225	Effect and Analysis of Unbalanced Voltage on Induction Motor Torque	73
	<i>Rudra Narayan Dash, Sangeeta Sahu and Chinmoy Kumar Panigrahi</i>	
226	Analysis and Implementation of a Novel Multilevel Inverter Structure using Reduced Power Electronic Switches and DC Sources	73
	<i>Rojalin Rout, Tapas Roy, Tanmoy Roy Choudhury, Byamakesh Nayak and Banishree Mishra</i>	
227	Development, Analysis and Simulation Study of a Novel Switched Capacitor Multilevel Inverter Structure for Different DC Source Configurations	74
	<i>Sitakant Debata, Tapas Roy, Silpashree Sahu, Thotakura NSC Sekhar and Abhijit Dasgupta</i>	
228	Modified Quadratic Boost Converter Adopting CLD Cell for High Voltage Gain useful in DC Distributed Generation	74
	<i>Tanmoy Roy Choudhury, Abhishek Singh, Subhendu Bikash Santra, Byamakesh Nayak and Arijit Karmahapatra</i>	
229	Design and Analysis of a Quadratic Boost Derived High Step Up Converter for DC Micro-grid Application	74
	<i>Arijit Karmahapatra, Tanmoy Roy Choudhury, Byamakesh Nayak and Subhendu Bikash Santra</i>	
230	Fast Charging a 12V Battery using Wireless Power Transfer Concept	75
	<i>Swagat Das and Sohan Chakraborty</i>	
231	Mitigation of Power Quality issues in Grid-tied Hybrid Energy System using 3-Phase Shunt Active Filter	75
	<i>Rudranarayan Senapati, Byomakesh Dash and Rajendra Narayan Senapati</i>	
232	Performance Evaluation of Multilevel Inverter based Static Synchronous Series Compensator for Power Flow Control	75
	<i>Rudranarayan Senapati, Byomakesh Dash and Rajendra Narayan Senapati</i>	
233	Performance Analysis of HvdC Lines using Surge Arrester	76
	<i>Aishwarya Sahoo, Madan Mohan Sahu, Shobha Agarwal and Abhijit Dagupta</i>	
234	A Review on Maximum Power Point Tracking for Solar Photovoltaic Power System	76
	<i>Bhabani Patnaik, Dr.Ullash Kumar Rout and Dr.Sarat chandra.Swain</i>	
235	Robust Shared Control between Human and Automated Vehicle Subject to Nonlinear Tire Forces and Disturbances	76
	<i>Jagat J. Rath, Rudranarayan Senapati, Chouki Sentouh and Jean-Christophe Popieul</i>	
236	Power Quality Assessment using Empirical-mode Decomposition with Hilbert Transform under Noisy Condition	76
	<i>S.K.Barik, J.Paramguru and P.K.Sahu</i>	
237	Harmonics Mitigation of a Solar Photo Voltaic based Generating System using Shunt Active Power Filter	77
	<i>Sarita Samal and Sarita Samal</i>	
238	An Overview and Comparative Study of Boost, Quadratic Boost, Interleaved and Boost with CLD Cell	77

	Converters	
	<i>Tanmoy Roy Choudhury, Byamakesh Nayak, Bhabani Sankar Dash, Aditi De, Ankita Roy</i>	
239	Can Plastic Solar Cells be Alternative to Silicon Solar Cells? <i>Shubham Kumar, Alivarani Mohapatra and Byamakesh Nayak</i>	77
240	Performance Analysis of Closed Loop Controlled Induction Motor Drive using Tandem Converter <i>Subrat Behera and Debashis Chatterjee</i>	78
241	Dual-frequency GPS Derived Precipitable Water Vapor and Comparison with ERA-Interim Reanalysis Data Over Indian Stations <i>M. Ravi Kumar, Sampad Kumar Panda, D. Venkata Ratnam and Rudra Narayan Dash</i>	78
242	GPS Satellite Signals Derived Ionospheric TEC and Assessment of IRI-2016 and SPIM-2017 Model Predictions over Indian Region <i>R. Kanaka Durga, Sampad Kumar Panda and Rudra Narayan Dash</i>	78
243	An Innovative Fuzzy based Power Quality Assessment of Distorted Electrical Power System <i>Sanhita Mishra, Pampa Sinha and Dr.Sarat Chandra Swain</i>	79
244	Optimal Power Flow Study using UPFC <i>Dr S.C Swain, Ramakanta Jena, Shaswat Chirantan and Dr.P.C.Panda</i>	79
245	Use of Feedforward Back-Propagation Neural Networks for Prediction of Energy Consumption by Appliances in an Energy Efficient House <i>Sushmita Das, Aleena Swetapadma and Chinmoy Panigrahi</i>	79
246	Use of ANN in Energy Consumption Studies in Buildings: A Review <i>Sushmita Das, Aleena Swetapadma and Chinmoy Panigrahi</i>	80
247	A Technique to Mitigate Inrush Current of Load Transformers using the Series Voltage Sag Compensator <i>Rudra Narayan Dash, K V V S R Chowdary and Satyaki Biswas</i>	80
248	Environmental Factors Affecting the Performance of Solar PV Cells: An Experimental Study <i>Satyaranjan Jena, Swagatika Sahoo and Sandeep Kumar Sahoo</i>	80
249	Transient Stability Analysis of a Two Machine Long Transmission System with Power System Stabilizer & Static Var Compensator <i>Shaswat Chirantan, Ramakanta Jena, Dr.S.C.Swain and Dr.P.C.Panda</i>	81
250	Steady State Power Flow Analysis using SSSC <i>Ramakanta Jena, Shaswat Chirantan, Dr.P.C.Panda and Dr.S.C Swain</i>	81
251	Review of Wind Power Conversion Methods <i>Thotakura NSC Sekhar, Udayan Banerjee and Tapas Kumar Saha</i>	81
252	The Current Signal Analysis for the arc stability in Tandem Gas Metal Arc Welding (T-GMAW) using Continuous Wavelet Transform <i>Mrityunjay Kumar, Thotakura NSC Sekhar and Bishwaindu Chakraborty</i>	81
253	Load Frequency Control for Hydro-Thermal System using Hybrid Gravitational Firefly Algorithm <i>Deepak Kumar Gupta and Ankit Kumar Soni</i>	82
254	Impact of Capacitor Allocation and Phase Balancing in Unbalanced Radial Distribution Systems <i>Padarbinda Samal, Tapas Roy and Thotakua NSC Sekhar</i>	82
255	Current Control using Artificial Neural Network for SPV Grid Connected System <i>Dr. Sarat Chandra Swain, Akash Adak, Sayan Chatterjee, Ritesh Dash and Shalini Biswas</i>	82
256	Performance Analysis of CCT through FRC & ANFIS for Grid Connected SPV System <i>Dr. Sarat Chandra Swain, Shreya Nandy, Shreya Mukherjee, Ritesh Dash and Souvik Nayak</i>	83
257	Performance Evaluation of a Grid Connected Photovoltaic System based On Solar Cell Modelling:- Part-III <i>Sanhita Mishra, Ritesh Dash, Dr. Sarat Chandra Swain and Debasish Pattnaik</i>	83
258	Multiloop Current Control Techniques for Grid Connected PV System with LCL Filter <i>Bachaknabi Pal, P. K. Sahu, S.R. Jena, Srikanta Mohapatra and S. K. Barik</i>	83

259	Harmonics Mitigation of a Solar Photo Voltaic based Generating System using Shunt Active Power Filter <i>Sarita Samal, Sandeep Kumar Sahu and Prasanta Kumar Barik</i>	84
260	Maximum Utilisation of Solar Energy for Smart Home Lighting System <i>Aditya Mukherjee, Nirmalya Roy, Aditya Kumar, Chandra Prakash, Sanskriti and Nirmal Kumar Rout</i>	84
261	Design and Performance Analysis of Memats in Vertical Transportation System <i>Devarakonda Chakradhar, Animesh Anand, Suvhojit Das, Suvendu Panigrahy, Thupakula Mahesh and Nirmal Kumar Rout</i>	84
262	Improvement in Switching Strategy for Grid Connected Pulse Width Modulated Voltage Source Inverter <i>Satyaranjan Jena, Sandeep Kumar Sahoo and Pradipta Kumar Sahu</i>	85
263	Verifying Identical Twins Identity using Curves of Their Palatal Patterns <i>Kamta Nath Mishra</i>	85
264	A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier <i>Bethanney Janney.J, S. Emalda Roslin and Shelcy Mary Jo</i>	86
265	Performance Evaluation of various Temporal Derivatives for Stabilization of Videos with Large Moving Objects <i>Paresh Rawat and Jyoti Singhai</i>	86
266	Assessment of Pollution-Induced Flashover of 11kV Porcelain Disc Insulators in Artificial Fog Chamber <i>Iliyasali Ashakali and Prof. M.F.A.R. Satarkar</i>	86
267	RAW IMAGE: A Transformation and QOII Analysis <i>Murugesh K and Mahesh P K</i>	86
268	Control of a PV integrated multilevel Inverter Fed with Matrix Converter <i>Gayatri Mohapatra and Asim Kumar Dey</i>	87
269	Parametric Representations of Automatic Birdcall Recognition Systems using the Gaussian Mixture model <i>Mrs. Ricky Mohanty, Dr. Bandi Kumar Mallik and Dr. Sandeep Singh Solanki</i>	87
270	Effect of Transition Metal Doped ZnO Coated on Al Working Electrode for K ⁺ Ion Sensor <i>Usharani panda, Arun K. Das, Farida A. Ali, Priyabrata Pattanaik, Sushant K. Kamilla and Dilip K. Mishra</i>	87
271	Perovskite Quantum dots Embedded in PMMA Matrix for Resistive Switching Device <i>Rajeev Ray and Suman Kalyan Pal</i>	88
272	Tunable Defect Mode in A 1D Plasma Photonic Crystal <i>Ranjita Panda, Suneet Awasthi, R.C. Singh and C. K. Panigrahi</i>	88
273	Reconfigurable Unequally Spaced Linear Arrays through Time-Modulation <i>S. Patra, S.K.Mandal, G.K.Mahanti and N.Pathak</i>	88
274	DCT-based Blind Watermarking Technique for ECG Signals <i>Fatma K Tabash and M. Izharuddin</i>	88
275	Estimation of Sea Surface Parameters using GNSS Reflected Signals <i>B.Deekshith and B.Leela kumara</i>	89
276	Probabilistic Study of Software Defects Underlying Relation between Pre-Release and Post-Release Defects <i>Dheeraj and Dr. Chhavi Rana</i>	89
277	Seawater Absorption and Mechanical Properties Evaluation of Polymer Matrix Hybrid Composite <i>Ramesh Kumar Nayak and Smaranika Nayak</i>	89
278	Wide Area Situational Awareness Enhancement using PMUs <i>Mahendra Meher, Cherukuri Murthy, Kunja Bihari Swain and D K Mohanta</i>	90
279	Cross Subsidy Reduction from Electricity Tariff while Making Distribution Company a Profit Gaining Entity <i>Varada J. Tambe and S. K. Joshi</i>	90

280	Adaptive Noise Cancellation from Color Images using a Novel T-S Fuzzy System for Noise Detection <i>Anita Sahoo</i>	90
281	Fault Analysis on Transmission Lines using Phasor Measurement Units: a Brief Review <i>Shakila Begum M. Nisar, Murthy Cherukuri, Kunja Bihari Swain and D K Mohanta</i>	91
282	Hiding a Color Image in a Scrambled Image <i>Himani Sharma, R K Sharma and Naveen Kumar</i>	91
283	An Advanced Procedure for the Analysis and Detection of Dermatitis Disease using Image Segmentation Methods <i>Prafulla N. Aerkewar and Dr. G. H. Agrawal</i>	91
284	A Brief review on Structural, Electrical and Magnetic Characterization of Bismuth Ferrites <i>Soumya G Nair, Dhanya S R and Jyotirmayee Satapathy</i>	92
285	<i>Low Complexity FBMC Scheme based On Symbol Cyclic Shift Equalization</i> <i>L Naga Venakata Durga Lakshman Rao and Smt.A.Rajani</i>	92
286	Implementation of Low Power Carry Skip Adder using Reversible Logic Gates <i>Addanki Purna Ramesh</i>	92
287	A Stock well Transform based Approach for the Detection and Classification of Hig Impedance Arc in Leaning-Tree and Sphere Gap <i>Himadri Lala and Subrata Karmakar</i>	93
288	Comparison of Five-level and Seven-level Converter for Grid –Independent PV System <i>Akash Ingle and Lumesh Kumar Sahu</i>	93
289	Energy-Efficient Cluster Head Range System for MANETs <i>K. Yadaiah, B. L. Raju and D.N. Rao</i>	93
290	Application of PD based Fuzzy PI Type FACTS Device and PSS Controller in Enhancing the Power System Stability <i>Bidyadhar Rout and B.B. Pati</i>	94
291	Optimization of Software Controlled Remote Center of Motion Manipulator for Maximum Isotropy <i>Siddhesh Rane and Dr. P.V. Manivannan</i>	94
292	Analysis of Grid-Connected Single-Phase Quasi Z Source Inverter for Distributed Generation Systems <i>Beena V, Jayaraju M and Gourikrishna</i>	94
293	Design and Implementation of an Internet of Things based Prototype for Smart Home Automation System <i>Kshirod Kumar Rout, Samuchita Mallick and Sivkumar Mishra</i>	95
294	Novel Schemes for Minimizing the PAPR in LTE-OFDM System <i>Chanamala Vijay, Gottapu Sasibhushana Ra and, Vinodh kumar Minchula</i>	95
295	Wireless Optical based Backhaul communication for 5G Cellular Systems <i>Vinod Kumar Mogadala, Sasibhushana Rao Gottap and, Babji Prasad Chapa</i>	95
296	Artificial Bee Colony Optimization for Improved Position Estimation of a GPS Receiver <i>Ashok Kumar.N and G.Sasibhushana Rao</i>	95
297	Analysis of Various Trust based Security Algorithm for the Vehicular Ad-HoC Network <i>Kuldeep Narayan Tripathi, Dr. S. C. Sharma and Ashish Mohan Yadav</i>	96
298	A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier <i>Bethanney Janney.J, S. Emalda Roslin and Shelcy Mary Jo</i>	96
299	Design and Analysis of WOA MPPT with Multilevel Interleaved Boost Inverter for Solar PV Panel <i>Bikram Kumar Pati and Laxmidhar Senapati</i>	96
300	Optimization of Software Controlled Remote Center of Motion Manipulator for Maximum Isotropy <i>Siddhesh Rane and Dr. P.V. Manivannan</i>	97
301	Design and Development of IoT-Cloud-based Lightning/Storm Detection System with an SMS Alert on Android Mobile <i>Raghavendra Rao Kanchi, Divyavani Palle and Venkata Prasad Sreeramula</i>	97
302	Simulation and Analysis of Single Phase Full Bridge Diode Rectifier with Different Passive Power	97

	Factor Correction Techniques	<i>G V Aparna, G Suresh Babu and T Murali Krishna</i>	
303	Design of Lane Detection Warning System using Matlab Simulink	<i>Manoj K.Demde and Dr. Prashant S. Sharma</i>	98
304	Decoding Brain Signals using DWT and MFCC	<i>Sneha Varma, Aishwarya Jaiswal, Ayesha Mundu and Akriti Nigam</i>	98
305	Identification and Study of the Kinematic Parameters for an Autonomous Ground Vehicle	<i>Praneeth Kumar Pedapati, Anantha Sai Hari Haran and Santanu Kumar Pradhan</i>	98
306	Observatory Stations under Probe Odisha: Weather Database Management for Weather Predictions	<i>Parimita Mohanty, Himansu Mohan Padhy, Pranati Mishra and Aradhana Misra</i>	99
307	A Comprehensive Study on Disjoint Paths in Planar Graphs	<i>Ehsan Jokar, Reza Fotohi and Behnam Seyedi</i>	99
308	Effect of Underlap with Fixed Gate Length:GaNBased Double Gate MOSFETs	<i>Md. Rokib Hasan, Marwan Hossain, Kefayet Ullah, Sk. Abu Rohan, Nafis Farhan Rashid, Farah Rafia, Maisha Rashid Nidhi and Ahsan Intishar Tomal</i>	99
309	Analysis of Various Routing Schemes of VANETs	<i>Tejinder Pal Singh and Nitika Kapoor</i>	100
310	Multimedia Big Data Security	<i>Preeti Chauhan, Arjun Choudhary and Atul Kumar Gupta</i>	100
311	An Efficient Approach for Defence Against Flooding Attacks in Ad hoc Networks using by Clustering Schema	<i>Behnam Seyedi and Reza Fotohi</i>	100
312	Email Spam Classification using Machine Learning and Computational Intelligence Techniques	<i>Kriti Agarwal and Tarun Kumar</i>	101
313	Automatic Cheque Number Recognition using Neural Network	<i>Ms.K.Bramara Neelima and Dr.T.Saravanan</i>	101
314	Identification of Distance Relays Vulnerable to Power Swing in a Power System	<i>Vidushi N, Sanjana K, Aniket P, Pavan G and Dr. S. A. Lavand</i>	101
315	Modern Agricultural Farming based on Robotics and Server-Synced Automation System	<i>Md. Abu Bakar Siddik, Mou Deb, Priyanka Das Pinki, Mrinal Kanti dhar and Md Omor Faruk</i>	102
316	Analytical Study on Fractal Dimension- A Review	<i>Sumitra Kisan, Sarojananda Mishra, Gargi Bhattacharjee and Ronak Bansal</i>	102
317	IoT X NodeMCU12e X MAX30100: An Experimental Survey with Pulse Oximeter and Heart Rate Sensor	<i>Antonio Carlos Bento and Norberto dos Santos</i>	102
318	IPV4 X IPV6, Results of a Study about Use of Internet Addresses	<i>Antonio Carlos Bento, Gabriel Alexandre Vieira, Osvaldo Julio Santos Monteiro and Luiz Henrique Furquim Sanches</i>	103
319	A Review on Techniques for Intelligent Traffic Management System	<i>Gurpreet Kaur, Usha Mittal and Kamalpreet Kaur</i>	103
320	A Comparative Analysis based on Security Parameters for Internet Integrated MANET: A REVIEW	<i>Mayank Tyagi, Shoaib Abbasi, Shobhit Kumar and Pooja Verma</i>	103
321	Day Ahead Load Forecast using Linear Regression and Artificial Neural Network Technique for 22kV Urban and Industrial Feeder	<i>Harsh M. Patel, Mahesh K. Mangukiya, Pratik A. Desai, Tejal H. Patel and Mahesh H. Pandya</i>	104
322	Routing Protocol Enhancement in Mesh Networks for Indoor based Location Services Using Pollination based Algorithm	<i>Meenakshi Nayyer and Vimal Kriti Sharma</i>	104
323	Design and development of IoT based System for Retrieval of Agrometeorological Parameters	<i>Aishwarya R. Jangam, Prof. Dr. K. V. Kale, Sandeep Gaikwad and Dr. Amol D. Vibhute</i>	104
324	An Experimental and Applied Survey with Internet of Things and NodeMCU12e with Tft Nextion	<i>Antonio Carlos Bento</i>	105

325	Detection of Oral Cancer in H&E Stained Images using Convolution Neural Networks <i>Rajashekhargouda C. Patil and Dr. Mahesh P. K</i>	105
326	Review over Mobile ad-hoc Network in Lightweight Cryptography Environment <i>Raghvendra Patel, Sonika Shrivastava and R.K.Pateriya</i>	105
327	Continuous Kannada Noisy Speech Recognition <i>Nadeem Pasha and Roopa.S</i>	105
328	Design and Development of a Mobile Robotic Complex <i>Aigul Adamova, Tamara Zhukabayeva, Laula Zhumabayeva, Zhanna Mukanova and Khu Ven-Tsen</i>	106
329	Shunt Active Harmonic Filter for Grid Connected Inverter <i>Miss. Supriya Sunil Kadam and Dr.Prof.Yuvraj Krishnarao Kanse</i>	106
330	A Unified Approach for Controller Design in Delta Domain using BFO Algorithm <i>Prasanta sarkar, Arindam Mondal and Sujon Roy</i>	106
331	A Unified Approach for Model Order Reduction in Delta Domain using BFO Algorithm <i>Prasanta sarkar, Arindam Mondal and Sujon Roy</i>	107
332	Prediction of cost and defects in software development using the Bayesian Algorithm <i>Madhuri Devanaboyina and Dr. K. Sita Kumari</i>	107
333	A Novel Method in Software Cost Estimation using Fuzzy Logic Techniques <i>Shahzad Kalantar and Amid Khatibi Bardsiri</i>	107
334	Speed Control of D.C. Motor using GA tuned Fractional Complex PI _x +iyD Controller <i>Sachin Sharma, Omar Hanif and Gaurav Kumar</i>	108
335	Automatic Garbage Collection and Dumping System – A Novel Design using Arduino and NI myRIO <i>Srilatha Madhunala, Hemalatha Rallapalli and Yashwanth Kumar T</i>	108
336	Detecting Blackhole Attack on DSR-based Mobile Ad-Hoc Networks by Hybrid Approach <i>Seyed Reza Ebrahimi, Vahab Ashrafian and Hayman Salih Mohammed</i>	108
337	New Switch Ladder Topology for Five Phase Multilevel Inverter Fed Five Phase Induction Motor <i>D. Raja and G. Ravi</i>	109
338	Variable Speed Direct Torque Control of Switched Reluctance Motor for EV Application <i>Parth Purohity, Prathamesh Bawkary and Pranav Murthy</i>	109
339	Study of Fading at 2.4 GHz WLAN in Tree and Foliage Environment <i>Amit Mukhopadhyay and Jyoti Prasad Singha Thakur</i>	109
340	A Knowledge based Approach to Analyze the Sentiment of Online Reviews <i>Alok Ranjan Pal, Yogesh Kumar Mishra, Soumen Maji, Subhapriya Sen and Partha Pratim Manna</i>	110
341	A Lossless Secret Image Sharing Scheme based On Bit Sharing Visual Cryptography <i>Kanusu Srinivasa Rao and Mandapati Sridhar</i>	110
342	Harmonic Minimization in Cascade Multilevel Inverters using: Ga-Iwd, Comparative Study <i>Akash Tyagi and Asif Iqbal</i>	110
343	Selected Studies of Sediment Tracking in Mixed and Gravel Beaches using RFID Technology – A Review <i>Dr. M. Periyasamy, Dr. G. Mahendran, Dr. R. Dhanasekaran and Dr. M. Senthilkumar</i>	111
343	Text Segmentation and Recognition Techniques in Image Email Detection: An Analysis <i>Mallikka Rajalingam and Dr. M. Balamurugan</i>	111
350	A Survey of Social Spider Optimization Algorithm: An Application Perspective <i>Saravanan R and Pothula Sujatha</i>	111
351	Evaluation of Power System Stability using Voltage Proximity Index <i>Chaithra A and Mrs.Sangeeta Modi</i>	112
352	Voltage Stability Impact Analysis of Wind based Distributed Generation System <i>Namra Joshi and Dr. Pragya Nema</i>	112
353	CCN- based Congestion Control Mechanism in Dynamic Networks <i>K.Rangaswamy and Dr. C.Rajabhusanam</i>	112

354	A study on Mutual Coupling Coefficient Reduction between Four Port MIMO Microstrip Antenna <i>Shiddanagouda.F.B, Dr.P.V.Hunagunad and Dr. Vani.R.M</i>	113
355	Design and Implementation of AES using FPGA <i>Mohamed I.Shujaa and Zulfikar A. Hussein</i>	113
356	Modeling & Simulation of Transient Response of a Armature-Controlled Direct Current Motor using MATLAB/SIMULINK <i>Suresh H L, Narendra Chaulagain, Darshan H S and Yashaswi K</i>	113
357	Motion Detection in Video using Content based Retrieval <i>Sudhakar Putheti and Mohan Krishna Kotha</i>	114
358	Real Time FPGA based Ethernet Control Communication for Robotic Arm by using Raspberry Pi <i>Dr. P .C. Bhaskar and Anuja Jayram Waingankar</i>	114
359	Home Automation Using Panoramic Image Using IoT <i>Dr.(Mrs.)Nupur Giri, Chetan Gupta, Mohit Choithwani, Prasanna Biswas and Piyush Gidwani</i>	114
360	Detection and Extraction of Abnormality from BrainMRI Image Using Extended Fuzzy-C-Means Clustering Algorithm <i>Ranjita Chowdhury, Samarpan Dutta, Pinaki Saha and Diptak Banerjee</i>	114
361	Improved Variance K Means Algorithm using Multi Objective Genetic Algorithm for Validate Cluster Generation <i>Ankur Saxena, Nikhlesh Pathik and Rajeev Gupta</i>	115
362	Virtual Walk-through of Stitched Image using Cylindrical Projection <i>Christi T. Pereira and Sujata P. Deshmukh</i>	115
363	An Advance Tree Adaptive Data Classification for the Diabetes Disease Prediction <i>Rukhsar Syed, Rajeev Kumar Gupta and Nikhlesh Pathik</i>	116
364	Using Source Side Channel Engineering on Junctionless Transistor for Improved Analog Performance <i>Avinash Kranti, Rahul Shandilya and Gaurav Saini</i>	116
365	A Novel Grey Wolves Optimization Method for Mobile Robot Navigation <i>Mohd. Nayab Zafar and J. C. Mohanta</i>	116
366	I-V Characteristics Analysis of Carbon Nanotube Field Effect Transistors and Graphene Nanoribbon Field Effect Transistor <i>Anjana Kumari, Suman Rani and Suman Rani</i>	117
367	Packet Collision Minimization in Sensor Networks by using Cooperative Routing Algorithm and Power Assignment <i>Ms. K. Satya and A. Sai Suneel</i>	117
368	A Data Mining Framework with Machine Learning for HealthCare Analysis using WEKA <i>Prof. Sujeet More and Prof. Aslam Karjagi</i>	117
369	Implementation of Kogge-Stone Adder using FinFET Technology <i>Nikhil Matkar, Nikhil Matkar, Mandar Gadekar, Siddhesh Jagushte and Dr. Sangeeta Joshi</i>	118
370	A Modified Indirect Current Control Algorithm for Power Quality Improvement using a New Hybrid PV-DSTATCOM <i>Soumya Mishra, Pravat Kumar Ray and Asini Kumar Baliarsingh</i>	118
371	MQTT based Tracking System of Multiple Mobile Devices and Sensors <i>Beena M. Patel, Beena M. Patel and Rachana V. Modi</i>	118
372	Optimization of Multi Objective Load Frequency Control using Cuckoo Search Algorithm <i>P. Praveena, Basavareddy and Dr. Soumya Mishra</i>	119
373	Solid State Smart Reactor for Fault Current Limiting <i>Vinita Kare</i>	119
374	Impacts of DG Optimal Location on Voltage Profile and Transmission Line Loading <i>Samikshya, Srinivasulu G and Balakrishna P</i>	119
375	Railway Automation Systems Diagnosis based on Bayesian Method <i>Waldemar Nowakowski, Piotr Bojarczak and Zbigniew Łukasik</i>	120

376	Masked Neural Style Transfer using Convolutional Neural Networks	120
	<i>Arushi Handa, Prerna Garg and Dr. Vijay Khare</i>	
377	IoT based Real-Time Remote Patient Monitoring System	120
	<i>Sagar S. Bachhav and Dr. Nilkanth B. Chopade</i>	
378	Design and Simulation of CAD Tools for Early Detection of Glaucoma	121
	<i>Divya shree s and Subarna Chatterjee</i>	
379	ECG Signal Measurement and Validation of Wearable Sensing Multi-Parameter Module	121
	<i>G H Soumya, Rajashekar Kunabeva, Vinutha L B and Balu Vasista</i>	
380	Fingerprint Classification with Reduced Penetration Rate using Convolutional Neural Network and DeepLearning	121
	<i>Sheena S. and Sheena Mathew</i>	
381	Increasing the Effectiveness of Time of Use pricing using Optimization Technique: A Case Study of HT Industry in Gujarat	122
	<i>Varada J. Tambe and S. K. Joshi</i>	
382	A Theoretical Approach for Privacy Preserving Location based K-Anonymity	122
	<i>Y.Lakshmi Prasanna and E.Madhusudhana Reddy</i>	
383	Hilbert Huang Transform and Type-1 fuzzy based Recognition and Classification of Power Signal Disturbances	122
	<i>Rahul, Rajiv Kapoor and M M Tripathi</i>	
384	Stiff Frame Encryption using Compression	123
	<i>Ramesh Makala, Gowtham Mamidiseti and Hemantha Kumar Budithi</i>	
385	Simulative Investigation of Ireless Sensor Network with the Deployment of Different Number of Nodes	123
	<i>Ravneet kaur, Dr Parveen Singla and Dr. Rinkesh Mittal</i>	
386	Performance and Load Testing: Tools and Challenges	123
	<i>Rakesh Kumar Lenka, Meenu Rani Dey, Pranali Bhanse and Rabindra Kumar Barik</i>	
387	Reduction of Accumulated Dispersion in 1Tbps Sband Long Haul DWDM Systems using ITU-653, ITU-655 and Corning Leaf Fibers	124
	<i>Rajandeep Singh and Maninder Lal Singh</i>	
388	Real Time Barcode based Student Attendance System using Internet of Things (IOT)	124
	<i>Champaka M.D and Dr. Shivputra A</i>	
389	Regional Pole Placement Technique to Stabilize Cart-Inverted Pendulum system	124
	<i>Harish Balaga and Marrapu Deepthi</i>	
390	Applying Descriptive and Predictive Analytics on Academic Dataset	125
	<i>Aanchal Phutela and Harkiran Kaur</i>	
391	Multilevel Encryption Technique to Sanitize Sensitive Data before Migrating To Cloud	125
	<i>Hitesh Marwaha and Rajeshwar Singh</i>	
392	Interactive Scene Analysis	125
	<i>Suprava Patnaik, Vinaya Wate, Suraj Gaurav, Noida Fernandes and Adish Bhatkar</i>	
393	Dimension Analysis in No-SQL Databases	126
	<i>Shweta Singh and Sanchita Paul</i>	
394	Spectral Subtractive Type Algorithms for Speech Enhancement and Objective Performance Evaluation	126
	<i>P.Sunitha and Dr.K.Satya Prasad</i>	
395	Efficient Secure Sparse Data Compression Techniques to Store Cloud	126
	<i>SHEIK SAIDHBI and Dr. Komati Thirupathi Rao</i>	
396	Construction of Gamma Energy Spectrum Response Function Matrix in NaI Detector	127
	<i>Qing-ju He, Liang-quan Ge, Fei Li, Kun Sun, Zi-qiang Wen and Jian-qiang Qin</i>	
397	Security and Privacy Aspects of Mobile Cloud Computing using Quantum Cryptography	127
	<i>Sudhanshu Maurya and Dr. Kuntal Mukherjee</i>	

398	Secure Data and Image for Hybrid Steganography and Watermarking Technique for Different Image File Format	127
	<i>Bandana and Prof. Akhilesh Jain</i>	
399	Machine Learning based Prediction of Anatomical Therapeutic Chemical (ATC) Class of Drug Like Molecule	128
	<i>Pankaj Vaidya, Ankit Gupta and Varun Jaiswal</i>	
400	Fault Detection by Sweep Frequency Response Analysis of 50 MVA 132/33 kV, 50 MVA, 50 Hz Power Transformer	128
	<i>Mr. Mahesh Ankushrao Adode and Dr. Bhoopesh N. Chaudhari</i>	
401	An efficient approach to perform Multi-Fuzzy Keyword Search over encrypted data in Cloud Computing	128
	<i>Bathina Siva Datta and Dr. Suhasini Sodagudi</i>	
402	Color Palette Selection in Thermal Imaging for Enhancing Situation Awareness During Detection-recognition Tasks	129
	<i>Divya Agrawal and Vinod Karar</i>	
403	Comparative Wavelength-Dependent Analysis of GaAs Buried-Gate OPFET for Visible Light Communication	129
	<i>Jaya V. Gaitonde, Sudhir Pal Singh Rawat and R. B. Lohani</i>	
404	Design of Compact Triple Band Monopole Antenna using Open-Ended and U-Shaped Slot	129
	<i>Samineni Peddakrishna, Sounik Kiran Kumar Dash, Usharani Anam and Papisetty Saritha</i>	
405	Wine Quality Detection through Machine Learning Algorithms	130
	<i>Akanksha Trivedi and Ruchi Sehrawat</i>	
406	Design and Development of FPGA based VLSI Architecture for Memory Efficient Motion Detection	130
	<i>Dr. Pradip Bhaskar and Aditi Kumbhar</i>	
407	Modelling and Simulation of Maximum Power Point Tracking Algorithm Based PV Array and Utility Grid Interconnected System	130
	<i>Sohel Aziz Syed and Dr. Alice N. Cheeran</i>	
408	Misuse and Anomaly Intrusion Detection System using Ensemble Learning Model	131
	<i>Anuradha S. Varal and Dr. S. K. Wagh</i>	
409	Virtual Mouse Implementation Using Hand Gestures	131
	<i>Shridevi Soma, Rishav Kumar, Sandeep S S and Shrinidhi Gour</i>	
410	A Study of Printed Dipole Antenna and Conformal Structures for 5G based Vehicular Communications	132
	<i>Y.Usha Devi and M S S Rukmini</i>	
411	Software Reliability in Pakistani Software Industry	132
	<i>Faheem Yaqoob</i>	
412	Towards the Greener Solar Technology	132
	<i>Rohan S. Kulkarni, Mr. Vishal R. Bhoi and Mr. Vijay Marathe</i>	
413	Fault Diagnosis and Fault-Tolerant Techniques for Switching Power Converters: A Review	133
	<i>Satyawan R. Jagtap and Dr. D. S. More</i>	
414	Recognition of Handwritten Digits Using Computer Vision Preprocessor based Combined Architecture of Self-organizing Map and Backpropagation on MNIST Dataset	133
	<i>Samarth Srivastava, Suryabhan Yadav, Kalpaj Agrawalla, Tanisha Malhotra and Dr N. V. Subba Reddy</i>	
415	Real Time Diagnosis of Patients Health by Monitoring Various Body Parameters using Compact RIO Platform	133
	<i>Kanchan V. Patil, Dr. R. M. Autee and Vitthal K. Bhosale</i>	
416	Effect of Mobility and Different Frequency on a MEMRISTOR and Simulation on SPICE	134
	<i>Akhilesh Kumar Chaudhary and R.K. Sharma</i>	
417	Comparative Analysis of BER and PAPR of UFMC Waveform in 5G Wireless Communication	134
	<i>Prashant Sharma, Dr. Surender Soni and Manish Maharshi</i>	
418	Performance Analysis of Adaptive Modulation by Optimized Viterbi Decoding	134
	<i>S Nandi, Ab Chaudhuri and J Bhar</i>	

419	Demonetization (500&1000): Analysis of Sentiments using NLTK with Twitter for Text and Image <i>Sugandha Bhatnagar and Tarun Kumar</i>	135
420	Design High Speed FIR Filter based on Complex Vedic Multiplier using CBL Adder <i>Anjali Singh Thakur</i>	135
421	Analytical Approach towards Progression of Renewable Energy in Uttar Pradesh: Current Scenario, Obstacles and Future Problems <i>Faraz Yusuf Khan, Swapnil Shukla, Shrish Bajpai and Naimur Rahman Kidwai</i>	135
422	Smart Digital Monitoring for Attendance System <i>Mohana H S and Mahanthesha U</i>	135
423	Embedding of Advanced Encryption Standards Encoded Data in Video using Least Significant Bit Algorithm <i>Anushree Patil</i>	136
424	FinFET Source-Drain Stressor Design Beyond 7nm Technology Nodes <i>Tara Prasanna Dash, Suprava Dey, Sanghamitra Das and Chinmay Kumar Maiti</i>	136
425	High-frequency Link Inverter based on Multiple-Carrier PWM <i>Sushil Ragde and S Kamble</i>	136
426	A Survey on Spectrum Sensing Techniques And Energy Harvesting <i>Anitha Bujunuru and Dr. T.Srinivasulu</i>	137
427	Backup Protection to the Transmission Line using Optimal Number of PMUs <i>Suved Pakade and Anil Vaidya</i>	137
428	Satellite Image Enhancement using Integrated Approach of Ant Colony Optimization and DCT-SVD <i>Mehreena Hasan and Tarun Kumar</i>	137
429	Performance Analysis of Fuzzy Logic based UPQC for Improvement of Power Quality in Distribution System <i>Sandhya Rani Jyothi and Rashmi Kapoor</i>	138
430	Interactive Scene Analysis <i>Suprav Patnaik, Vinaya Wate, Suraj Gaurav, Noida Fernandes and Adish Bhatkar</i>	138
431	Interface for Physically Disabled <i>Mamta D'Britto, Abhijit Joshi and Narendra Shekokar</i>	139
432	An Efficient Congestion Control by Loss based Active Queue Management Technique <i>Devpriya Panda, Sukant K Biosy and Chhabi Rani Panigrahi</i>	139
433	Decentralized Predictive Control of Distributed Generator and Energy Storage System in an Islanded Microgrids <i>Jayachandran M and G Ravi</i>	139
434	An Application-specific Architecture for Routing Protocol in Wireless Micro-sensor Network <i>Poonam Saini and Deepak Bhatia</i>	139
435	IMC Tuned Modified Smith Predictor for Delay Dominated Integrating Processes <i>Somak Karan and Chanchal Dey</i>	140
436	Methods and Means of Incoming Quality Inspection of Printed Circuit Boards <i>Dmitry Korzh, Dmitry Vorunichev and Mihail Kostin</i>	140
437	Computational Linguistic Approach for Sentiment Analysis <i>Prakash Kumar Singh and Sanchita Paul</i>	140
438	Standalone PV System with Fuzzy MPPT controller <i>Ramu Edukulla and Sobhana O</i>	141
439	A New Wireless Sensor Network based Model for Healthcare Data Collection from Rural Areas <i>Hirav Shah, Amit Sengupta, Sudipta Roy, Hemant Singh Rao and Akash Bhardwaj</i>	141
440	Channel Estimation and Data Detection using Optimized Cyclic Prefix in MIMO OFDM Systems <i>S Nandi and Nn Pathak</i>	141
441	Design and Performance Analysis of Transmission Gate Based 8T SRAM Cell using Heterojunction Tunnel Transistors (HETTs) <i>B V V Satyanarayana and M Durga Prakash</i>	142

442	Implementation of a Fuzzy Controller on Low-Cost Embedded Systems for Learning Process Control <i>Jorge Buele, John Espinoza, Victoria López, Pablo Zambrano, Angel Soria, Daniel Fiallos, Franklin Salazar and Homero Velasteguí</i>	142
443	Analysis of Segmented SAR-ADC in 90nm CMOS Technology <i>Anil Khatak, Manoj Kumar and Sanjeev Dhull</i>	142
444	Peak Insertion and Active Constellation Extension with Subcarrier Grouping PAPR Reduction Techniques for OFDM System <i>Pranav Kashyap and Khushal Thakur</i>	143
445	Prediction-based Routing Protocol for V2V Communications in Urban Environment <i>Tran Hung</i>	143
446	Weather Parameters Analysis for Hourly Forecast of Electricity Generation by Photovoltaic Power Station on the Day Ahead <i>Petro Lezhnyuk, Vyacheslav Komar, Serhii Kravchuk and Natalia Sobchuk</i>	143
447	Solar Tracking Module using Arduino <i>Deepak Rasaily, Anmol Pradhan, Dhan Rupa Chettri and Tika Maya Sharma</i>	144
448	Implementation and Analysis of Wavelet Transform Methods for Satellite Image Resolution Enhancement <i>Vijayalaxmi Patil and Santhosh B</i>	144
449	A Survey on Routing Algorithms for Wireless Sensor Network <i>Harsh Sharma and Kanika Sharma</i>	144
450	Optimization of Energy Consumption in Routing of Wireless Sensor Nodes in Disaster Environments <i>Zeynab Nomiri and Esmaeil Zeynali Khosraghi</i>	145
451	Pole Placement Technique for Control of an Inverted Pendulum on a Cart System <i>Afreen Islam and Dr. Satyajit Bhuyan</i>	145
452	Performance Analysis of Voice over Internet Protocol (VoIP) over LTE Networks <i>Smita Lonkar and K T V Reddy</i>	145
453	A Novel Single Carrier Frequency Domain Channel Equalizer without Cyclic Prefix <i>Ugur Elmagoz, Yasin Kus, Mukremin Kavlak and Ali Ozen</i>	146
454	Small Scale Grid Penetration Strategies <i>Debashis Jana, Arpan Sinha, Barun Mandal, Debapriya Palai and Aruni Maji</i>	146
455	Analysis of Various Trust based Security Algorithm for the Vehicular Ad-Hoc Network <i>Kuldeep Narayan Tripathi, Dr. S. C. Sharma, Ashish Mohan Yadav</i>	146
456	Reconstructing the Evolutionary Trajectories of the Progesterone Receptor gene and Spi-1 Proto-oncogene based on Information-Theoretic Differences between Modern Human and Neanderthal <i>Sunil Dehipawala, Regina Sullivan, Eric Cheung, George Tremberger Jr, David Lieberman and Tak Cheung</i>	147
457	Fractal analysis of Image Contour Features in Killer T-cell and Solar Dynamics Observatory Video Data <i>Sunil Dehipawala, Regina Sullivan, Eric Cheung, George Tremberger Jr, David Lieberman and Tak Cheung</i>	147
458	Brain Stroke Detection using Integrated K means and FCM in Brain Images <i>Maya B S and Asha T</i>	148
459	Increasing the Efficiency of Outcome in Chatbot by Applying Embedded Search Engine <i>Parimi Shiva Kalyan, Ch Vijaya Bhaskar and V Kakulapati</i>	148
460	Adaptive Neuro-fuzzy inference system for Binaural Source Localization <i>Jeremy Scerri, Kris Scicluna, Clive Seguna and Joseph Zammit</i>	148
461	Thyristor Binary Compensator Strategy for Reactive Power Compensation and PF Improvement using Static VAR Compensator <i>Ajay Lohate and Mandar Chaudhari</i>	149
462	What We Can Do To Save Humanity in the Coming Era of Global Eavesdroppers <i>Victor Christiano, Florentin Smarandache and Victor Christiano</i>	149
463	Research of Athletes' Movements Biomechanics in Big Tennis using Motion Capture Technology and Image Processing <i>Olga Shikulskaya, Dmitriy Anuriev, Mikhail Shikulskiy and Ruslan Ramozanov</i>	149
464	Fractal Analysis of Cosmological Galaxy Formation Simulation Images and Application to	149

	Instrumentation <i>Sunil Dehipawala, George Tremberger Jr, Raul Armendariz, Corey Stalerman and Tak Cheung</i>	
465	Design and Analysis of IoT Topologies using SDN Platform <i>Dhananjay Mule and Bharat Chaudhari</i>	150
466	Applied Communication Technology To Support Tourism Web Collaboration At Provincial Level In Indonesia <i>Suroto Adi and Sulisty Heripracoyo</i>	150
467	Framework for Analysing Web Access Logs using Hadoop and MapReduce <i>Pranjali Borgaonkar</i>	151
468	Adaptive Control of Parallel Power Converters for Load Sharing in DC Micro-grid <i>Lokendra Singh and D.K. Palwalia</i>	151
469	Series Parallel Converter Configuration in a Grid for Power Quality Improvement and Micro-grid Application-Construction and Control Strategy <i>Roshan Shinde and Girish Walke</i>	151
470	Sudden Fall Detection and Protection for Epileptic Seizures <i>Padma Tatiparti and Ushakumari Chintalapati</i>	152
471	DiRetNet - A Deep Convolutional Neural Network for Determining Diabetic Retinopathy Category from Retinal Images <i>Akash Dabhi, Nachiket Makwana, Archit Masurkar, Sarvesh Narkar and Vaishali Jadhav</i>	152
472	Simulation of Real Time Multiprocessor Static Scheduling Algorithms <i>Madhukumar Patnala and Ralla Nagendra</i>	152
473	A Framework for Granular Security in Cloud Computing using Cryptographic Access Control <i>Aparna Manikonda</i>	153
474	Weather Prediction using Data Mining <i>Devidas Bhat and Dr.Balasubramani R</i>	153
475	A Distributed Algorithm with Rooftop Solar Photo Voltaic for Balancing Domestic Loads <i>Vaibhav Jain, Naveen Jain and Umesh Agarwal</i>	153
476	Segmentation of Brain Lesions in MR Images <i>Sweta Tripathi, R. S. Anand and Eugene Fernandez</i>	154
477	A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier <i>Bethanne Janney and S.Emalda Roslin</i>	154
478	Comparison of Neural Network Approaches for Flood Forecasting: Case Study of Cauvery Basin, India <i>Puneet Misra and Shobhit Shukla</i>	154
479	A Clustering-based Framework for Avoidance of Multiple Attacks in Wireless Network <i>Jitendra Kumar Gora and Nidhi Nigam</i>	155
480	Transparent Neuro-fuzzy Rule-based Classification System <i>Heisnam Rohen Singh and Saroj Kr Biswas</i>	155
481	Comparative Analysis of PI / PID Controller for a Thermal Process Using PLC <i>Manivasagam Rajendran and Gabriel Santhosh Kumar</i>	155
482	Web Page Recommendation System using Artificial Neural and Semantic Network <i>Megha Raghu and Megha Vashisht</i>	156
483	Design and Implementation of a Homemade Remote Control and Obstacles Avoidable Fire Extinguisher Robot <i>M. I. Haque, G.Martuza Chowdhury, Rafidul Islam, S M Rezwanul Islam, M.S Anower and Mozammel Hossain</i>	156
484	Analysis of Movement of Metallic Particles for 400 KV Segregated Gas Insulated Substation using Different Numerical Methods <i>Giri Prasad Ambati, Dr.Poonam Upadhyaya, Dr.Surya Kalavathi Munagala and Karthik Nachagari</i>	156
485	Solar Energy Prediction using Meteorological Variables <i>Devangi Solanki, Utsav Upadhyay, Siddhi Patel, Reema Chauhan and Shubhangi Desai</i>	157
486	Rectangular Slotted Microstrip Antenna with Linefeed for Amateur Radio Operations <i>Mahesh Manik Kumbhar, Dr. Satish Tanavade and Pradnya Ravindra Narvekar</i>	157

487	Industrial Surveillance Video Analysis using Compressed Sensing <i>Unnikrishnan K T and Byjubai T P</i>	157
488	Subject Selection for Secondary Education; Available Resources and Future Challenges <i>Kapil Sethi, Gaurav Gupta and Varun Jaiswal</i>	158
489	An Applied Survey with ESP8266 Lolin + Shield Base with Nextion Touchscreen Display <i>Antonio Carlos Bento</i>	158
490	An Experiment with Arduino Uno and Tft Nextion for Internet of Things <i>Antonio Carlos Bento</i>	158
491	Defected Ground Structure in the Aspect of Substrate Integrated Waveguide Circuits: A Review <i>Padmini Nigam, Santasri Koley and Arjuna Muduli</i>	159
492	A Study on Automatic Latent Fingerprint Identification System <i>Uttam U. Deshpande and Dr. V.S. Malemath</i>	159
493	IoT based Semi-automated Military Combat System <i>Dr. Layak Ali and Apoorva Joshi</i>	159
494	Optical Character Recognition based Zooming <i>Vipin Anand and Ankit Navik</i>	160
495	Automatic Investigation of Micronutrients and Fertilizer Dispense System using Microcontroller <i>Arun Patokar and Dr.Mrs. Vinaya Gohokar</i>	160
496	Developing a mobile APP for Inquiry-based Learning about Insect Worlds <i>Ah-Fur Lai and Chi-Rui Hong</i>	160
497	Modeling and Simulation of Single Phase Photovoltaic Five Level Cascaded H Bridge Inverter using Matlab <i>Komal Teli and Shobha Savanur</i>	161
498	Reduction of ISI by Beamforming Transmission in IEEE802.11ac <i>Balwant Singh, Vinod Shokeen and Rishi Asthana</i>	161
499	Developing New Hybrid Cryptography based Security for Cloud Computing System <i>Narmadha R</i>	161
500	Performance Analysis of CP-Reuse based Estimation Technique for High Mobility Node <i>Sandeep Sarowa, Naresh Kumar and Sunil Agrawal</i>	162
501	Power Conditioning of Microgrid by Using a Fast-Acting DC-Link Voltage Controller for 3-Phase D-STATCOM <i>Shravani Kakkerla, Prof. S.S Thulasiram Sankara and Dr.A.Srinivasula Reddy</i>	162
502	A Novel Technique to Improve Performance Evaluation of Domino Logic Circuits in CMOS and FinFET Technology <i>Abhijit Kumar Singh and Uday Panwar</i>	162
503	A MATLAB based Study on Inductively Active Filtering Method for Power Quality Improvement of Grid Connected PV system <i>S Deokar</i>	163
504	Task Scheduling with Load Balancing on Automotive Multicore ECUs <i>Geetishree Mishra and Rajeshwari Hegde</i>	163
505	Blood Bank: An Application to Manage Blood Bags <i>Mukta Desai, Anand Hiremath and Netra Toravi</i>	164
506	Analysis and Characterization of Switched Reluctance Motor using Four Quadrant Operation <i>Bhagyashree Mahajan</i>	164
507	Analysis of Performance of VSC based HVDC Power Transmission System by using 9 Bus 3 Generator System <i>Pratiksha Shinde and Jagdish Helonde</i>	164
508	Pedestrian and Vehicle Detection in Automotive Embedded Systems using Deep Neural Networks <i>Parampreet Kaur and Rajeev Sobti</i>	165
509	Stability and Performance Analysis of Low Power 6T SRAM Cell and Memristor based SRAM Cell using 45NM CMOS Technology <i>Seelam Vasavi Sai Prabhu Deva Kumar, Shaiwal Suman, Arup Sarkar and Vivekanand Kushwaha</i>	165
510	Fully Informed Particle Swarm Optimization for Solving Economic Load Dispatch <i>Shivam Verma, Sarthak Bhatia, Khushboo Verma, Shweta Verma and Asif Iqbal</i>	165

511	Design and Interfacing of I2C Master with Register and LCD Slaves	166
512	Sainath Chaithanya Aravall, Sindhuja Dharra, Bhavana Dablikar and Vennela Paithari Comparative Analysis of Curve Reconstruction using Fuzzy C Means and Subtractive Clustering	166
513	Stop Word Removal Algorithm for Tamil Language	166
514	Mercy Evangeline M and Dr. Shyamala K Modeling Methodology for Oil Production Wells with Electrical Submersible Pumping using the System Identification Theory	166
515	Jorge Andres Prada Mejia, Luis Angel and Julian Andres Peña Florez Optimal PMU Placement for Observability of Power System Network based on Critical Bus Ranking	167
516	Chandana Sushma Garaga and Jyothsna T.R Comparison of Simulation Tools for BCD Integration	167
517	Mukula Reddy, Manojkumar Reddy, Jhansi Lakshmi and Manikanta Te Time Synchronization for CoAP-based Home Automation System	167
518	Vishakha Khatade and Anuja Askhedkar Design and Analysis of an efficient 3D – NoC (Network On - Chip) Router	168
519	Veadesh B and Venkatapragadeesh B SQLi Attacks – A Breathing Threat to Web Application Security	168
520	Dr. Arvind Sharma, Chandershekhar Sharma and Ashwinder Tanwar ECG Analysis and Automatic Detection of R-peak in MATLAB	169
521	Monika Panghal and Dr. R.K Sharma MATLAB SIMULINK based ECG Analysis and Detection of R-peaks	169
522	Monika Panghal and Dr. R.K. Sharma Half Side-wall Spacer Engineered Junctionless FinFET	169
523	Neha Saini and Gaurav Saini Research and Development Procedure in Image Processing and it's Major Areas	169
524	Mohit Sanguri On Efficient Scheduling Schemes in Multiagent Wireless Sensor Networks Simulation Systems	170
525	Dimitrios Karras A Time Series Approach to Forecast Weekly Number of Cases of North West Delhi: Case Study	170
526	Kumar Shashvat Pipelined DES Using Novel Method for Key Schedule on FPGA	171
527	Dr. Pradip Bhaskar and Miss Namrata Ugale Performance Analysis of Directly Coupled Solar Photovoltaic Powered Irrigation Pumps	171
528	Maruti Naik, Basanagouda Ronad, Suresh H Jangamshetti and Shshikant Kori Study of Digital Performance Parameters of Channel Engineered Junctionless Transistor	171
529	Sheetal Rani and Gaurav Saini An Active Power Filter based on Three-level NPC Inverter with Fuzzy Logic Controller	171
530	Seema Agrawal, Rakesh Kumar, Vijay Kumar Gupta and R.K Somani Power Quality Improvement using SAPF based on SRF with EPLL Strategy	172
531	Seema Agrawal, Deepika Sharma, Dheeraj Palwalia and R.K Somani Classification of EEG based Imagine Speech using Time Domain Features	172
532	Yogesh Paul, Ram Avtar and Sanjay Kajal Low Bit rate Intra Prediction Coding for Medical Image Sequences using HEVC Standard	172
533	Ketki Pathak, Parth Vagela, Jay Desai and Anand Darji Crosstalk and Interference Analysis for Four Cluster MSB Optical Topology	173
534	Kajol Gundile and Bharat Chaudhari Identifying Major Critical Factors Faced by Tourism Industry using Apriori Alogorithm	173
	Prafulla Bafna and Anagha Vaidya	

535	Curvelet Bound Type-2 Fuzzy Logic based Detection and Classification of Power Quality Events.	174
	<i>Rahul, Rajiv Kapoor and M M Tripathi</i>	
536	Implementation of Lagrangian Decomposition Model for Unit Commitment Problem using Wind Generating Units	174
	<i>S Maheswari and R Santhoshkumar</i>	
537	Equalizer Enhances Broadband Characteristics of Vector Modulator based Linearizer	174
	<i>Bhumi Bhatt and Subhash Chandra Bera</i>	
538	Surface Characterisation of Nano Image using Matlab	175
	<i>Hemanth Kumar M S, Nuthan A.C and Sumitha C</i>	
539	Design and Architecture of Wireless Body Area Network using Android Application	175
	<i>Kumar Keshamoni</i>	
540	Design and Installation of Grid Connected Roof Top Solar PV System	175
	<i>Satya Mishra</i>	
541	A Study on the Impact of SHGs on their Development of their Attitudes and Skills of Women in Krishnagiri District.	176
	<i>Dr. Beulah Suresh and Arivuselvey Jayaraman</i>	
542	A Study on the role of Integrated Village Development Project (IVDP), Krishnagiri in Empowering the Women of SHG in their Social and Personal Life.	176
	<i>Dr. Beulah Suresh and Arivuselvey Jayaraman</i>	
543	Enhanced Asymmetrical PWM AC Chopper Fed Capacitor Run Induction Motor Drive using Bacterial Foraging Optimization Algorithm	176
	<i>Murali N and Balaji V</i>	
544	Review on Mobile Ad-hoc Network in Lightweight Cryptographic Environment	177
	<i>Raghvendra Patel, R.K. Pateriya and Sonika Shrivastava</i>	
545	Smart Energy Meter Monitoring System using IoT [Internet Of Things]	177
	<i>Prof. Parag Datar, Prof. Vani Datar, Sourabh Kulkarni and Rahul Gore</i>	
546	Filtering Techniques for Denoising Image	177
	<i>P Jayapriya and Manimegalai R</i>	
547	Obstacle Avoidance for Autonomous Mobile Robot using Hybrid Artificial Immune System	178
	<i>Prases K. Mohanty, A.A Kodapurath, Rishi Kumar Singh, Rohit Kumar Singh, Dibyajyoti Saikia and Shubhasri Kundu</i>	
548	Hybrid SET-CMOS based Implementation of Three-Point Median Filter for Image Processing Applications	178
	<i>Arpita Ghosh and Subir Kumar Sarkar</i>	
549	Gesture Recognition Techniques: A Comparison on the Accuracy & Complexities	178
	<i>Ajay Kumar, Anil Khatak and Anju Gupta</i>	
550	Design of Channel Encoder with Security	179
	<i>Ravi Kumar and Padmaraju Koppereddy</i>	
551	Capacity Enhancement for Coded-Beams High Throughput Satellite Systems	179
	<i>Eman Salah, Dr. Joseph V. M. Halim and Prof. Dr. Hadia M. El-Hennawy</i>	
552	A Study on Mutual Coupling Coefficient Reduction between Four Port MIMO Microstrip Antenna	179
	<i>Shiddanagouda F B Byanigoudra, Dr.Vani R.M and Dr.P.V Hunagund</i>	
553	PDE-Based Filter Adapted to Poisson Noise for Restoration and Enhancement of Computed	180

	Tomography Images	
		<i>Nikhil Singh and Rb Yadav</i>
554	Development of Electrical Energy Generation based Uninterrupted Operation for Grid Integration of Utility using RES	180
		<i>Vilas Bugade and Dr. Pradeep Katti</i>
555	Enhanced Asymmetrical PWM AC chopper fed capacitor run induction motor drive using Bacterial Foraging Optimization Algorithm	180
		<i>Murali N and Balaji V</i>
556	Low Power PVT Robust Area Efficient Pulse Triggered Flip-Flop Design	181
		<i>Indira Ponugumtla and Maddu Kamaraju</i>
557	Noble Approach to Develop Smart Wheel Chair for Handicapped People	181
		<i>Fatin Hasnath Chowdhury, Hasan Uz Zaman, A S M Muktadiru Baized Shuvo, Al Amin Hossain, S M Hasibul Hoq, Nusrat Jahan Tamanna, Tasfiqul Ghani, Nazia Nawar Hassan, Mohammed Jawad Ibne Ishaque, Rashik Ishrak Nahian and Sifat Rezwana Tamim</i>
558	Tamil Handwritten Character Optical Recognition	181
		<i>Manimegalai R, Adarsh S, Praneshwar C, Kathiresan A, Gokul Ram Mt and Naveen Kosgi</i>
559	Impact of Wind Power Integration on Transient Stability of Power System	182
		<i>Gauri Deshmukh and S.R Deore</i>
560	Evolution of Proportional Integral Derivative Controller	182
		<i>Omar Hanif and Vatsal Kedia</i>
561	Design of Dual Band T-Shaped Dielectric Resonator Antenna (DRA) For Radar Application	182
		<i>M. Chandra Kiran, K. Phani Priyanka and K. Rama Devi</i>
562	Development of Embedded Stethoscope for Heart Sound with Noise Reduction Feature using ZIGBEE Module	183
		<i>Gunasekhar P and Dr. Vijayalakshmi S</i>
563	A Variational Approach to Reconstructing Mammogram Images Corrupted by Poisson Noise	183
		<i>Sneha Tiruwa, Rb Yadav and Ayushi Verma</i>
564	An Interpretation on Type-I & Type-II Compensators for PWM Controlled SBC in VRM Applications	183
		<i>Vaman B Gudi and Paramesh A</i>
565	Copy –Move Forgery Detection – A novel Approach	184
		<i>Jigna Patel and Ninad Bhatt</i>
567	Simulation of Sinkhole Attack on RPL Routing protocol	184
		<i>Ashwini Dalvi</i>
568	Samiksha: Low Cost Field Monitoring System	185
		<i>Siddharth Srivastava, Akanksha Garg, Richa Verma and T.V. Prabhakar</i>
569	Physics of Open System. Non-standard Approaches in the Context of Studies of Multidimensional Coupled Chaotic Systems of Fractional Order	185
		<i>Eduard Vladimirovsky and Bahram Ismailov</i>
570	Wearable Health Monitoring System Using Arduino GEMMA	185
		<i>Vinay Bandekolla and Jyothi Bathula</i>
572	A Noble Approach to Develop Smart Travel Bag	186
		<i>Zunayeed Bin Zahir, Fatin Hasnath Chowdhury, Nazia Nawar Hassan, Shabbir Ahmed, Sifat Ayat Jahan, Abu Al Mahadi and Nusrat Jahan Tamanna</i>

Techno-Economic Feasibility of Wind-Solar Hybrid Systems for Rural Electrification of Sioure Village in Sahel

Nogyo Diaw, Lamine Thiaw, Oumar Ba, Thi Thi Soe, Swathi.A and G. Giridhar

Abstract: This paper focused on techno-economic feasibility analysis of Sioure village to develop wind-solar hybrid model by using HOMER (Hybrid Optimization Model for Electric Renewables) software. The case study area is Sioure, one village in Sahel. Sioure village locates in $16^{\circ} 27' 23.98''$ N latitude and $14^{\circ} 8' 50.98''$ W longitude (North of Senegal). It is a remote village dependent on agriculture, livestock and fisheries, with no grid extension. This village has enormous potential in terms of production of renewable energy to bridge a gap for electricity supply. From NASA record, the monthly average solar radiation data $5.87 \text{ kWh/m}^2/\text{day}$ and wind data (4.4m/s) can be the generation source for village electrification case. Therefore, the wind-solar hybrid system is an alternative to supply the production of electricity in this village. From hybrid model simulation, the cost of energy is about $0.1879\$/\text{kWh}$ when the total net present cost is about $588,566 \$$. The system has no greenhouse gas emission. While the selling price of Electricity is considered in $0.20\$$ (120 FCFA), the simulation result is more economical system to design integrated system with minimum total net present cost and cost of electricity. Therefore, this wind- solar hybrid model design can able to be the single most favored option for dealing with electricity supply in the study area not only economically but also environmentally.

A Concentric Hexagonal Slot-loaded Circular-shaped Super Wideband Fractal Antenna

Srinivasarao Alluri and Nakkeeran Rangaswamy

Abstract: This article presents a super wideband (SWB) circular-shaped fourth iterative fractal antenna with concentric hexagonal slots. It has a total size of $40 \times 27 \times 1.6 \text{ mm}^3$. A tapered microstrip feed-line and a partial ground plane are used. Simulation results of the antenna show that it provides a bandwidth from 1.43GHz to more than 40GHz (percentage bandwidth greater than 186%) with a bandwidth ratio of approximately greater than $28:1$ for $S_{11} < -10 \text{ dB}$. Simulated radiation patterns at different frequencies and peak realized gain are presented and discussed. It has the advantages of super wide bandwidth and compact size.

Reservation Based Resource Allocation with Dynamic Admission Probability for WSN-MCN Convergence Network

Anita Swain, Arun Kumar Ray and Prasanta Kumar Swain

Abstract: This Ubiquitous application of cell phones leads to an idea of using cell phones as a carrier of sensor data, which can create a larger network. This represents an idea of heterogeneous network such as cellular network and wireless sensor network to emerge as WSN-MCN convergence network. These mutually benefit both the network but the resource allocation that shares spectrum resources between cellular users and WSN user is critically challenging. We propose a reservation based resource sharing scheme that reserves a part of the spectrum for cellular users and rest part of the spectrum is dynamically allocated to users of both the network. An analytical model has been developed to determine various performance factors of the converged network in terms of channel allocation. The proposed model is compared with existing schemes and numerical results are presented in the form of graphs.

Automated Analysis of Scinti-Mammography based on Particle Swarm Optimization

Monalisa Bhattacharjee

Abstract: In the Medical Oncology domain, early detection and removal of the primary lesion is an essential and useful method to boost survival rate and reduce mortality. Scintimammography is a relatively modern imaging method to exhibit cancer tissue in the breast. A radiopharmaceutical agent Technetium ^{99m}Tc -SestaMIBI is incorporated intravenously to the breast, and the images are generally taken under a Gamma Camera. The affinity of the cancer tissue to this radiopharmaceutical is up to 9 times in comparison to healthy breast tissue. The general purpose of the paper is to execute and evaluate a method for the analysis and segmentation of Scintimammography images. The multi-step region detection system to analyze lesions in breast image is proposed. First the preprocessing is done using median filter to enhance the image followed by a noise removal using Gaussian filter. Next, the edge detection of the image is done by Canny edge detector. The image is segmented in different regions based on Blob detection. The results are optimized based on particle swarm optimization which is a heuristic global optimization technique. The above mentioned processes are tested on different Scintimammography images randomly retrieved from popular search engine and work has been implemented by MATLAB R2009b package. The experimental results are satisfactory and can be used as a better alternative in place of usual mammography.

A Multi Valued Logic VHDL Package for Switch Level Simulation of Novel Digital CMOS Circuits

Péter Keresztes, Attila Tukacs and Miklós Török

Abstract: The new VHDL package proposed in this paper makes it possible to perform switch level logical simulation of a wide selection of CMOS circuits, in particular those that utilize the temporary charge storage phenomenon occurring on the MOSFET input capacitance for their operation. In addition to the high impedance value Z , there are 5 various strengths driven values and 3 stored values of equal strength, which are weaker than the driven values. Four MOSFET models (strong-n, strong-p, weak-n and weak-p) are belonging to the package. The paper shows that how the MOSFET models supported by the resolution function use the stored values as 'nut washers' under the driven values, realizing with this the logical modeling of temporary charge storage. The new package supports the switch level logical simulation of the most versions of CMOS circuits.

Design and Application of a Self-tuning based Feed-forward Control for a Non-minimum Phase System

Kajal Sharma and Raseswari Pradhan

Abstract: The control of system with non-minimum phase dynamics is challenging one. Most of the available techniques are incapable to cover the entire situation and, in many case it leads to complex controller. Therefore, a new but simple technique is proposed in this paper. A self-tuning control algorithm for feed forward controller based on adaptive control is proposed in this paper. A simple and operative way is developed to performed gradient decent in the design parameter. The objective of this technique is to minimize the error function. The tuning of the controllers is being done on a delay-free SISO model. Several illustrative examples taken from previous works are included to demonstrate the

simplicity and superiority of the proposed method over those already published both for robust stability and to reject load disturbance.

Speed Control of Sensorless BLDC Motor based on MFO Algorithm

Swati Swagatika and Nutan Saha

Abstract: Brushless DC motors are very popular in numerous applications due to its superior electrical and mechanical characteristic because of its trouble free construction. This paper presents an approach of speed control of sensorless Brushless DC motor using Moth Flame Optimization (MFO) algorithm. Rotor position is being detected by using input observer technique. MFO algorithm is used to tune the parameters of PID controller used as speed controller. Simulation of the sensorless BLDC motor with tuned PID parameters have been carried out in MATLAB/SIMULINK. The results of this model have been compared with the basic BLDC motor model with Hall sensors and PI speed controller for verification of proposed method. Speed of motor is improved in sensorless BLDC in low speed region and error is reduced to very less value compared to sensor model.

Influence of Drain Doping Engineering in Triple Splitted-drain TFET Model

Disha Bhattacharjee, Bijoy Goswami, Dinesh Kumar Dash, Ayan Bhattacharya and Subir Kumar Sarkar

Abstract: Recent study approaching effects of drain engineering has commanding outcomes on all characteristics and parameters of a 2D TFET model. This paper propose two TFET structures where drain is splitted into three region with different doping concentration. Splitted drain structure display reduction in ambipolar conduction due to increase of the tunnelling width at the channel-drain junction and a significant reduction of OFF current without hampering the ON current. The structures are named according to the doping concentration of the drain regions: High-Low-High Splitted-Drain TFET (HLH-SD TFET) and Low-High-Low Splitted-Drain TFET (LHL-SD TFET). The fundamental device characteristics and parameters are analyzed for two proposed structures and their performance are examined for optimal evaluation. All the simulation are done in Silvaco, Atlas.

Wide Band Filtenna with Inductively Loaded SRR for Ku-band Application

Soumya Ranjan Mishra and Sheeja K L

Abstract: This paper presents a Ku-band filtenna for wireless application. The proposed filtenna have the merits of compact size, light weight, less price and uncomplicated fusion with other planar circuits, in comparison to other circuits. The structure uses low cost FR4 as substrate having 4.4 relative dielectric constant and 0.02 loss tangent. On one side of substrate rectangular shaped patch acts as the radiating element and on other side four numbers of inductive loaded Split Ring Resonator (SRR) have been placed. The SRRs play a vital role in selecting the resonant frequency and works as a band pass filter. The filtenna structure was simulated with HFSS 13.1. The simulated bandwidth of the proposed structure is 3266 MHz at resonant frequency 16 GHz. The Radiation pattern at both E and H-plane shows omni-directional characteristics. The simulated peak directivity and peak gain are 8.3131 dB and 4.9445 dB respectively at Ku-band. This newly addressed technique has the potential for future wireless communication.

Real Time Language Identification using Speech Signal

Sourav Padhee, Shreema Dash, Jaydeep Jena, Debashisa Samal and Susanta kumar Sarangi

Abstract: Automatic language identification has become an important feature in a variety of speech-enabled multilingual applications. Language identification is the task of automatically detecting the language(s) present in a speech signal. In this paper, we are going to identify the language from a speech signal taking some speech signals of different languages. Language identification can be very useful for designing user interface based on the user's speech input. This methodology can be implemented to make a product universally acceptable, and would let the user interface adapt to the user automatically, making the user interaction a swift and easy process.

Power Sharing Strategy of Renewable Energy Sources in Microgrid Considering Economic Aspects

Kumari Kasturi, Chinmay Kumar Nayak and Manas Ranjan Nayak

Abstract: Geographical and economical constraints restrict conventional power supply to a large no. of remote locations in India where electricity may be provided by off-grid renewable sources. This paper aims at finding out an optimal amalgamation of standalone solar, wind and micro-hydro units with the objective of minimizing the cost of electricity (CE) ensuring improvements in system reliability and efficiency. The Salp Swarm Algorithm (SSA) is used as the optimization tool to evaluate different combinations, each for four different cases, in order to obtain the best solution. The results obtained prove SSA to be fast, reliable, robust and efficient.

Design of A CPW Fed Wideband Patch Antenna for S-band Applications

Jyotibhusan Padhi, Madhulita Mohapatra and Subrat Kumar Panda

Abstract: This paper contains a latest design of a slotted CPW fed patch antenna accompanied by bandwidth characteristics is introduced. The design consists of a slotted rectangular patch. The CPW fed is further introduced to enhance the bandwidth of the suggested antenna. A triangular aperture is placed on the radiating patch to enhance the surface current density over the patch surface. After final layout, the reflection loss response is less than -20dB with the frequency range of 2.81 GHz to 3.92 GHz. The designed antenna offers Omni-Directional radiation pattern in H-plane. As this designed antenna operating from 2.81 GHz to 3.92GHz, it is a suitable candidate for S-band applications such as mobile communication, cordless telephones, Wi-Fi and other indoor wireless applications.

Harmonic Minimization of Grid-connected Photovoltaic System using Sinusoidal Pulse Width Modulation

Mr. Suraj Kumar Panigrahi and Dr. Kanhu Charan Bhuyan

Abstract: The grid connected Photovoltaic (PV) system is gaining more and more attention due to its associated abilities of uninterruptable electrical power supply. The increasing demand for sustainable energy production has led us to focus on the power electronic circuit interfaced with the renewable energy sources. To increase the efficiency of the produced solar energy, DC-DC boost converters with

an advantage of Maximum Power Point Tracking (MPPT) are considered as a far-fetched solution. In this paper, a PV module with MPPT has been designed. This work also includes the design and control of cascaded inverter with SPWM, which helps to reduce the total harmonic distortion (THD) and gives a better dynamic response and accuracy in tracking references. A comparison between different inverter topologies has been proposed here for better result analysis.

Hierarchical and Partition based Clustering Techniques Comparison in Cloud Computing

Akankshya Aparajita, Shrabanee Swagatika and Debabrata Singh

Abstract: Clustering is used as an important procedure in the process of data mining, where information of large datasets are transformed into meaningful and concise data. It performs activities like pattern representation, using of clustering algorithms and their validation, data abstraction and finally result generated. Clustering has many categories of algorithms such as partition-based, hierarchical-based, density-based, grid-based etc. Partition-based is the centroid-based clustering. Hierarchical-based clustering is link-based. Density-based is clustering is focused on area of higher density in the dataset. Grid-based clustering relies on size of the grid. In this paper, we discussed different clustering techniques as well as, a detailed review on the partition-based and hierarchical-based algorithms. Finally we compare clustering algorithms on the basis of attributes like time complexity, capacity of handling large datasets, scalability, sensitivity to outliers and noise, and also discussed result after solving a particular dataset implemented in cloud computing environment.

Dstar-Lite Routing Algorithm for Extending Wireless Sensor Networks Lifetime

Imad S. Alshawi

Abstract: Wireless Sensor Networks (WSNs) are energized by inexpensive batteries with limited power. A remarkable amount of energy is consumed by wireless data transmission. Therefore, energy efficient routing protocols can conserve battery power and gives the network longer lifetime. Using complex protocols to plan data routing efficiently can reduce energy consumption but can produce processing delay. This paper proposes a new routing method that incorporates Dstar- Lite to find the optimal path from the source to the destination. The proposed method reuses the path until specific amount of energy consumed in such a way that keeps energy consumption fairly distributed over the nodes of a WSN while reducing the delay of calculating the routing path from scratch. Simulation results demonstrate the effectiveness of the proposed method in terms of decreasing end-to-end delay, reducing energy consumption as compare with Fuzzy logic and A-star algorithm. The results also show that, the network lifetime achieved by Dstar-Lite could be increased by nearly 20% and 24% more than that obtained by Fuzzy logic and A-star algorithm, respectively.

Automatic Power Quality Events Recognition using Empirical Wavelet Transform and Random Forest Technique

Mrutyunjaya Sahani, Ranjan Keshri, Soumya Ranjan Mohapatra and Itibrata Senapati

Abstract: In this paper, empirical Wavelet transform (EWT), Hilbert transform (HT) and random forest (RF) are integrated to reorganized the signal as well as simulation of power quality events (PQEs) in a real time. EWT is a method used to figure out series of amplitude modulated- frequency modulated

(AM- FM) signals for different given signal, known as detail and approximate coefficients. Hilbert transform is used to extract the productive features from the detail and approximation coefficients. The terms standard deviation of magnitude, Hilbert energy array, Shannon entropy and crest factor are extracted from the Hilbert array and train to classifier random forest. RF is a quintet learning technique used for classification and regression purposes. The algorithm commences with the selection of many bootstrap samples from the data. Furthermore, the proposed less computational complex and superior classification accuracy based EWTHT-RF method is implemented in the digital signal processor (DSP) based platform to validate the feasibility of the proposed method.

Model Predictive Control of a Double Input DC-DC Converter with Battery and PV Source

Dr. Lopamudra Mitra

Abstract: In this paper a double input dc-dc converter is used to deliver the power, which uses two sources one is PV and other is a battery. This converter can take power from both the sources at a time as well as from a single source at a time. A model predictive controller is used to control the output voltage.

Allocating Loss with Network Reconfiguration in Radial Distribution Networks

Sivkumar Mishra and Ambika Prasad Hota

Abstract: In this paper, loss is allocated to the various nodes in a radial distribution network when the network undergoes reconfiguration to reduce the overall power loss. A new method of loss allocation is formulated using the bus identification scheme described. Network reconfiguration is performed using branch exchange based heuristic method where the bus identification scheme changes dynamically with changing topology of the network for obtaining a minimum power loss configuration. Loss allocation is then performed for the reconfigured network and the original network. The loss allocation results of a 69-bus radial distribution system are analysed and compared.

Time Transfer in Wireless Media for Distant Device Synchronization through UHF Link

U.Mandal, R.R.Sahani, B. Biswas and H.K.Ratha

Abstract: Time synchronization is most vital in event management and co-relating time critical real time data. Inter- Range Instrumentation Group (IRIG) time formats are well established time synchronization format used worldwide. This paper describes two customized techniques which utilize the IRIG-B time code format. These techniques provide time synchronization to remote devices without any wired connection. In one of the techniques IRIG-B AC signal is Frequency modulated (FM) in particular Ultra High Frequency (UHF) with proper modulation settings and transmitted by a low power amplifier. In other technique, IRIG-B DC signal modulates two sub-carriers to generate a Continuous Wave Frequency Shift Keying (CWFSK) signal, which is further up-converted to the UHF band. A remote receiver down converts and demodulates the signal to baseband domain. The baseband signal is further demodulated and decoded to synchronize the remote devices or sensors.

Load Frequency control with PDPID Controller Including Double Derivative Filter

Priyambada Satapathy, Manoj Kumar Debnath, Nimai Charan Patel and Pradeep Kumar Mohanty

Abstract: This research analysis paid emphasis towards the development of advance novel Proportional derivative Proportional integral derivative (PDPID) controller associated with double derivative filter, which has been employed in the automatic generation control over a reheat and non-reheat based thermal power system. This paper has developed a hybrid control arrangement by genetic algorithm to tune the constraints of the controller gains. Inclusion a disturbance of 1% has been done to verify system robustness in area 1. An error function known as integral time absolute error (ITAE) has been taken as the objective function in order to find the optimum values of the PDPID plus double derivative controller gains. The vigorous performance of the system is placed to do comparison with standard PID controller and the efficiency is established toughly.

Smart Wheel Chair for DifferentlyAble People using DTMF Control

Sanjeev Kumar Das and Dr. Lopamudra Mitra

Abstract: In this world a number of people are differently-abled. Their life revolves around wheels. This paper presents an approach for controlling wheelchair movement using DTMF of a smart phone. The aim of DTMF controlling method is to introduce an automated ambulation tool, that helps the users to control their wheelchairs' position and move it via a smart phone to the desired destination. This application also provides the user with the ability to control the wheelchair even when sitting on it, moreover, the user can give orders to adjust the path. It even works under no internet facility. The encouraging results set a path for implementing this concept in more aid-systems.

Moth Flame Optimization based Two-staged (PDF+1PI) Controller for Load Frequency Control

Tarakanta Jena, Manoj Kumar Debnath, Prateek Prasad Ray and Smaran Kumar Sanyal

Abstract: Inspired from the nature, this paper proposes the utilization of an optimization technique example titled as Moth Flame optimization (MFO) which is used to tune the parametric gains of the fusion of Proportional with Derivative controller along with Derivative Filter (PDF) & (1-Proportional Integral) for Automatic Generation Control (AGC) of the power systems. Firstly, a two area thermal reheat power system is considered with a loading disturbance of 10% in area-1. Pre-eminence of the MFO algorithm is demonstrated by matching the performance results to the outputs by the pre-published results of the ABC tuned PID controllers [8]. Then, the study is extended via increasing the load by 10% in area-1. Integral Absolute Time Error (ITAE) is the objective function of this paper. Domination of proposed method in conditions of responses of the settling time, undershoot & overshoot over other controllers is proved.

A Robust LSB Image Steganography Technique Using Chaotic Logistic Map

Md. Anwar Hussain and Popi Bora

Abstract: Least significant bit (LSB) image steganography is widely used for hiding sensitive information. Chaotic maps are nonlinear functions with highly complex behaviour, dependent on initial conditions and parameters, and unpredictable time evolution. In this paper we report a robust LSB steganography technique based on chaotic map to hide iris feature information in a cover grayscale image. The feature information is encrypted by an equal length random sequence; the random sequence is generated using chaotic map and dependent on pixel information of the cover image. The technique is highly robust as its key space is very large and also has a very good PSNR value.

A Modified Watershed Transform for Brain Tumor Segmentation and Extraction of MR Images

J.Mehena and M.C. Adhikary

Abstract: Segmentation of tissues and structures of medical MR image plays a vital role in medical imaging applications for medical diagnosis. Image segmentation helps in diagnosis of brain diseases and helps in quantitative analysis of MR images such as measuring accurate size and volume of extracted portion. Diagnosis of brain tumor is difficult due to different shapes and sizes of tumor. Treatment plans and evaluation of disease progression of that disease affect specific tissues or structures, lead to loss and abnormalities. An automatic reliable and accurate segmentation of these tissues and structures can improve diagnosis and treatment of brain diseases. Manual segmentation is bias and usually accurate but is impractical for large datasets because it is tedious and time consuming. More powerful and automatic segmentation techniques can be useful for clinical applications. They have the ability to segment like an expert, excellent performance for diverse datasets and reasonable processing speed for large datasets because it is tedious and time Consuming. In this chapter we propose a modified to the watershed transform for accurately detecting the location of brain tumor in MR images.

Condition Monitoring and Overhauling of Electric Motor Driven Reciprocating Air Compressor for Better NVH

Chandrabhanu Malla, Saisubramanyam Pulugandla, Samarjit Swain and Isham Panigrahi

Abstract: Condition monitoring is the process of checking the parameters like Vibration, Temperature, Noise, Alignment, and Oil etc. In reciprocating air compressor the rotating motion is converted to reciprocating motion, which produces vibrations in the compressor. Health monitoring is required to check the condition of air compressor. In this work a FFT analyzer is used to perform the vibration test on old set-up of a reciprocating air compressor to find out the root cause. Beside, Belt alignment tool, Oil check monitor and Belt tension gauge is used to check the alignment, oil and belt condition to minimize the vibrations and noise created by the machine. Noise level readings are recorded by Noise level meter and overall bearing vibrations are tabulated by using the machine condition advisor device in this paper. It is observed that faults like belt misalignment, pulley unbalance, looseness of mounting bolts and oil contamination are present. This leads to high noise and vibration level. Subsequently, the

faulty parts are replaced or repaired. Finally, significant improvement is achieved in NVH of the air compressor.

Solution of LFC Problem using PD+PI Double Loop Controller Tuned by SCA

Nimai Charan Patel, Manoj Kumar Debnath, Binod Kumar Sahu and Pranati Das

Abstract: Here a double loop PD+PI controller is projected to resolve the load frequency control issue in a dual area conventional hybrid source system. Basing up on a time variant fitness function Sine-cosine algorithm is employed to tune the PD+PI double loop controller's gains. The dual area unified system comprises three types of generating sources in all the areas named as gas, hydro and thermal unit. The system behavior is examined under two dissimilar conditions i.e. in presence of HVDC link and in absence of HVDC link. For both type of investigations an abrupt load perturbation of 1% is considered in first control area. The dominance of projected PD+PI double controller is verified over existing results of PID type conventional controller throughout the examination.

Fault Detection of Large Scale Wireless Sensor Networks using Six Sigma score

Sarthak Mohanty, Deepika Rani Sahu and Arunanshu Mahapatro

Abstract: Technological developments in wireless sensor networks (WSN) through the use of various networking protocols, it provides enough scope in vast range of applications of the physical world that guarantees for consistency and accuracy of data. With the help of six sigma score and correlation as a parameter, faulty sensor nodes are identified. Using Markov Chain in the network, rank/rating was found from the correlation. From the light of Rating, a statistically efficient algorithm was developed known as Six Sigma z-score. Simulation results show that it is effective in finding faulty nodes giving importance to quality nodes. Experimental results show it outperforms both voting and statistical algorithms test in terms of detection accuracy and false alarm rate.

Modified Array of Circular Patch Antenna for 5.9 GHz WLAN Application

Ribhu Abhusan Panda, Abhisekh Kumar Sharma and Mahesh kumar

Abstract: In this paper the design and the study of the circular patch antenna is being proposed by using the HFSS (High frequency structure stimulator) software. Patch and substrate will play the vital role in the performance of the proposed antenna. The circular patches are on the top of the substrate. Dimensions and material of the substrate has an influence on the output parameters of the antenna. Analysis is done to demonstrate the output parameters i.e., the return loss, VSWR, gain total, s-parameter, polar-plot & radiation patterns. The modification and feeding was completed by using the cylindrical probe which provides the better resonating frequency.

All-Optical Micro-ring resonator based optical XOR and XNOR logic gate

Rajiv Kumar, Niranjana Kumar, Poonam Singh and Ajay Kumar

Abstract: All-optical XOR and XNOR gates are proposed. An all-Optical device does not need optoelectronic conversion thus all-optical devices find application in the high-speed communication system. The proposed paper explores the concept of switching activity of Micro-Ring resonator (MRR). Further, the switching activity MRRs are efficiently applied to implement the All-Optical XOR and XNOR logic gate using the Micro-Ring Resonator Structure. The paper describes the mathematical aspects of the proposed devices along with the appropriate layout diagram. The discussed schemes are verified using the appropriate MATLAB Simulation result.

Brain Tumor Extraction using Optimal Gabor Wavelet and Otsu's Thresholding

Lingraj Dora, Sanjay Agrawal and Rutuparna Panda

Abstract: Brain tumor extraction is a critical task in treatment planning and evaluation of response to therapy. This is due to the complex shape, size and heterogeneity of the tumors. Magnetic resonance (MR) imaging is the standard technique used by the expert/radiologists during the diagnosis of brain tumor. However, it is a time consuming and tiresome task. In this paper, a feature selection scheme followed by segmentation method is investigated for the brain tumor extraction task. Optimal features are extracted from the input brain MR image using the evolutionary single Gabor kernel (ESGK) based method. These features are utilized by the Otsu's thresholding method for segmentation of tumor region. Finally, morphological operations like erosion and dilation are employed to extract the tumor region only. The suggested technique is applied to a standard database from the brain tissue segmentation (BRATS) 2103 challenge. It is compared with other brain tumor extraction methods using different performance indices. The result shows its superiority as compared to other methods.

Development of Energy Efficient and Aquatic friendly Solar Electric Boat

Akhilesh Kumar Dewangan, Isham Panigrahi and R.K. Paramguru

Abstract: Development of high efficient ecofriendly means of transportation in water bodies without harming the aquatic life is discussed in this paper. History is witness that the traditional means of transportation in water bodies has created lots of pollution and along with that it has affected the life under water. To solve this problem a four passenger capacity Solar Electric Boat is designed, developed, tested and practically demonstrated to public. It operates under completely natural and renewable source of solar energy beside unique design of its hull preserves aquatic life.

Simulation of Electrical Power Generation using Concentrated Photovoltaic Cell through Solar Parabolic Dish Concentrator

Susant Kumar Sahu, N.Sendhil Kumar and Pavankumar Hanamanthavarajula

Abstract: Stating from domestic to commercial purpose, every time throughout the global electricity is becoming essential in 21st century to meet all needs of human being. Conventional energy source is not that much sufficient to compensate growing energy demand due to scarcity of fossil fuels. Therefore it may be considered as the call of time for searching of new renewable energy source in future to overcome this energy crisis which is now regarded as a major social challenge. In this context solar energy is considered as a best alternative due to certain factors such as carbon neutral energy, clean and affordable one. Photovoltaic power generation is the technique based on the direct transformation of sun light in to electrical energy by means of solar cell working on photovoltaic effect. But till date the installation cost of this technology seems to be quite high compared to conventional power system until unless a large government funding or subsidies are not being provided. So in order to avoid this problem, concentrating photovoltaic sun light has significantly made its stand due to its high efficiency, cheap and reduced area of requirement conversation. Lot of attempts has been made to produce electrical power through CPV (concentrating photo voltaic) by using numerous type of concentrator such as parabolic dish, trough, and Fresnel-lens with an occupied area in the range of 100-200m². However value of power generation by solar technology is highly influenced by geographical condition of the site and annual efficiency of the system. Greenius is an effective, reliable and user friendly interface tool for calculating and analyzing of different power projects like solar trough, photovoltaic cell, wind energy, dish stirling systems etc. Also economical feasibility of a new renewable power projects are easily predicted prior planning and installation by this tool. In this paper electrical power, voltage and current produced by 12.6 m² parabolic dish concentrator with a CPV system has been numerically simulated using Greenius software package.

Whale Optimization Algorithm based Automatic Generation Control integrating DFIG for Two Area Power System

Ravi Shankar

Abstract: The size of modern power system is increasing rapidly with rising trends of non-conventional energy sources like wind energy for economical operation. But the rising trends of wind energy system raise complexity in the power system for matching load demand. Therefore to maintain system equilibrium better control scheme and optimisation technique is necessary. In this paper a two area power system with thermal power plant, hydro power plant, gas power plant and Doubly Feed Induction Generator (DFIG) in both the area is analysed. A Proportional-Integral-Derivative (PID) controller with a derivative filter is used to control the damping in the system. Also a new meta-heuristic Whale Optimisation Algorithm (WOA) is used to optimise the controller gain.

Grey Wolf Algorithm based Control Strategy for Load Frequency Control in Coordination with IPFC

Ravi Shankar

Abstract: This paper highlights the effect of energy storage device i.e. Redox Flow Battery (RFB) in the interconnected power system. The overall power system contains conventional thermal, hydro, gas

and wind power plant in a two area power system. The thermal power plant comprises certain physical non-linearities like Generation Rate Constraint (GRC) and Governor dead band (GDB) for realistic approach. This paper also comprises the effect of a Flexible Alternating Current (AC) Transmission System (FACTS) device i.e. Interline Power Flow Controller (IPFC) in series with tie line. A Proportional- Integral-Derivative (PID) controller with a derivative filter is introduced to control the power system and externally attenuate the noise in the system. At last a powerful meta- heuristic Grey Wolf Optimization (GWO) is used to tune controllers and other parameters in the system.

Lion Algorithm based Load Frequency Control for Interconnected Power System in coordination with UPFC and Electric Vehicle

Ravi Shankar

Abstract: The research attraction towards the renewable and green energy sources going to increases so PEV has great potential to participate in ancillary services. PEV has fast active power controllability and has large energy storage capacity makes PEV attractive. Large number of PEV has large energy storage capacity and has potential to participate in LFC. Due to less dependence on fossil fuel and less greenhouse gas emission makes attractive and the penetration of PEV in market is going to increases. In this paper discussed about the aggregation of PEV. Each PEV has different state of charge (SOC) and participation of PEV depending on its SOC. In this paper all the parameter of controller is tuned for LFC by the new optimization technique called lion optimization technique (LOA). LOA is nature inspired metaheuristic algorithm inspired by social hierarchy behaviour of lions from their birth till their death.

Volleyball Premier League based LFC and Comparative analysis of different Energy Storage System for Interconnected Power System

Ravi Shankar

Abstract: This Effect of energy storage devices like Redox Flow Battery (RFB), Capacitive Energy Storage (CES) and Super Conducting Magnetic Energy Storage (SMES) in interconnected multi-area, multi-source power system is analysed in this article. Also effect of Interline Power Flow Controller (IPFC) with energy storage devices is studied. A two area power system incorporating conventional thermal, hydro and gas power plant in each area is proposed in this article. Thermal power plant is associated with practical constraints like Generation Rate Constraint (GRC) and Governor Dead Band (GDB). A Proportional-Integral-Derivative (PID) controller with a derivative filter is introduced. Here derivative filter works as a noise attenuator. A powerful meta-heuristic Volleyball Premier League (VPL) algorithm is introduced for optimization of PID controllers gain and other system parameters. At last result obtained with different energy storage devices is compared and dominance of RFB over other energy storage devices is shown.

Overlapped Feature-Preserving Multiscale Error Diffusion for Digital Halftoning

Nihar Ranjan Panda and Ajit Kumar Sahoo

Abstract: A new digital halftoning process established on multiscale error diffusion technique is suggested in this paper. In this work an overlapped feature modified multiscale error diffusion

technique is proposed. The noticeable features of the algorithms are 1. Image quadtree, 2. Selection of the dot through maximum intensity guidance theorem, 3. Feature modified non causal diffusion of error. The superiority of the halftoned is assessed through subjective and objective estimation. For the objective evaluation mean square error and universal quality index are considered in this paper.

Impact of Small AC Signal Superimposed on DC bias on the Performance of Nanoscale SON MOSFETs

Tapas Chakrabarti and Subir Kumar Sarkar

Abstract: Nanoscale fabrication of devices is precisely the future of all integrated circuits. In our previous works, quantum analytical models for DMG SON MOSFETs have been developed in the nano-regime and it was established that SON is superior to SOI because of its higher immunity to different short channel effects. SON's features and increased current driving capability, along with enhanced device scalability, provide scope for further device miniaturization, without influencing device performance. This specific work focuses on instability of such device structures, when a small AC signal superimposed on DC signal is applied at the gate, which is the real time situation in many applications of MOSFETs. The outcome obtained is compared with their corresponding bulk MOS structures. Small AC signal superimposed on DC voltage changes various electrical characteristics of DMG SON MOSFET, such as Surface Potential, Electric Field, V_{TH} , and others. Fluctuation of these characteristics in case of normal bulk devices can be accounted as negligible, but has a significant impact on advanced structures like nanoscale DMG SON MOSFETs, resulting in performance degradation.

Low Power Multiparameter Health Monitoring System: An Advanced Patient Diagnostic Approach

V.G.Girhepunje, Dr. Santosh D.Chede and N.S.Ambatkar

Abstract: The developed electronics in biomedical field has now been extended to the level of remote patient monitoring. Telemedicine system is an effective outcome of it and has proven boon to the people especially living in rural, tribal as well as in the interior parts of the globe. Patient with inherent acuity of complexity, the critical illness which requires frequent checkups are benefited with these systems. In this direction, lot of research has carried out to develop the wireless patient monitoring based on Bluetooth, mobile communication system, RFID WLAN systems, satellite system, GPS, GPRS, 2G,3G and even 4G systems. In all such systems the patient's data is transmitted using various protocols. All the available systems facilitate the patients mostly with offline remote health care. However, these systems still can be made more advanced by some added features in order to transmit necessary body parameters like ECG, Blood pressures, Temperature and heart beats, required for the quick diagnosis. Hence, using MSP432P401R, an ultralow power telemedicine system capable to transmit physiological information throughout the globe is designed, developed and analyzed. It may turn out to be an advanced patient diagnostic approach.

All-Optical Single Bit Magnitude Comparator using the Micro-Ring Resonator Structure

Rajiv Kumar, Niranjana Kumar, Poonam Singh and Ajay Kumar

Abstract: The conventional digital circuit cannot work at high frequency. The all-optical devices can be operated at high frequency. An all-optical device does not need any electric to optical and optical to

electric conversion. In this paper, an all-optical single bit magnitude comparator is proposed using the cascaded micro-ring structure. The match between the mathematical expression and the simulated result confirms the accuracy of the proposed device.

A Novel Framework for Early Prediction of Forest Fire using Internet of Things

Kamal Kumar Ghanshala, Rahul Chauhan and R.C Joshi

Abstract: Forest fire is one of the concern issues for society in terms of a loss in natural resources & loss of wildlife. In recent years this problem has become more prominent because of global warming. In this paper, a comprehensive framework is proposed for the early detection and prediction of forest fire in real time environment by the use of edge computing (FOG) and Internet of things (IOT). Entire wireless sensor network (WSN) is designed by using sensor nodes which are designed by taking several environment parameters like humidity, temperature, infra red (IR) radiation and combustible gas. A sensor node is designed by taking ARDUINO 2560 as a processing element, LM35-temperature sensor, RHT-03 – Relative Humidity & Temperature sensor, MQ-02 smoke sensor & infrared sensor. Locally the information is collected through Zigbee protocol and uploaded to the FOG cloud to reduce the latency in network. LEACH as a routing protocol is used for hopping in network. Weather index is generated from the collected data using artificial neural network (ANN) and further information uploaded to central cloud for taking the necessary action

Ear Localization and Validation Using Ear Candidate Set

Ayushi Rastogi, Koushendra Kumar Singh and B K Singh

Abstract: Ear biometrics has been found to be a good and reliable technique for human recognition. Initially ear biometrics could not gain popularity because there were doubts about its uniqueness. But, it started to gain momentum after a theory which came into existence and which said that it was very unlikely for any two ears to be completely identical in all respects. The implemented methodology consists of steps such as pre-processing, feature extraction and matching based on the selected features. Our technique determines the extent to which these features support matching. We worked on a dataset containing 60 images for analysing their features and carried out matching of the source image with the dataset images. On the basis of images correctly classified we obtained the system accuracy telling us the extent to which matching could be performed on the basis of selected features.

Steepest Descent Optimization based Adaptive Equalizers for Linear Time Invariant and Mobile Cellular Channels

SSNL Venkateswara Rao and Gottapu Sasibhushana Rao

Abstract: Digital communication systems offer high data rate and efficient transmission through the channel. Low bit error rates assess the quality of any communication system. Bit Errors occur as the result of Adjacent Channel Interference (ACI), Co- Channel Interference (CCI) and Inter Symbol Interference (ISI) in the presence of Noise. These interferences are more prominent in mobile cellular systems owing to dispersive nature of the channel. Channel dispersion is attributable to multiple reflections in Mobile cellular systems. Equalizer technique is one of the important methods of countering the ill effects of channel. The response of the equaliser should be closely inverse of the channel response. Then the interferences are reduced to great extent by proper equalizers in the

receiver end. It attempts to recover the original transmitted symbols at the receiver. In the absence of Channel knowledge, Adaptive equalizer offers superior performance. In this paper, Steepest Descent algorithm is discussed. This algorithm applied in Adaptive equaliser for time invariant and Mobile cellular channels. The efficiency of above algorithm in terms of Bit Error Rate versus SIR is analysed for both channels.

Electric Field Induced Enhancement of Multisubband Electron Mobility in Asymmetric V-shaped Double Quantum Well Structure

Sangeeta K Palo, Ajit K Panda, Trinath Sahu and Narayan Sahoo

Abstract: We study the effect of electric field F on multisubband electron mobility μ in asymmetric V-shaped double quantum well (VDQW) structure. The asymmetry in the structure is due to different doping concentrations N_1 and N_2 towards the substrate and surface sides respectively. We calculate μ by considering ionized impurity (Imp-) and alloy disorder (Al-) scatterings. The functional dependence of μ on F shows nonlinear behavior. Here Imp- scattering is reduced due to linearly graded alloy concentration and occurrence of all the diffused electrons around the centre of the well. However, presence of Al- scattering throughout the well, reduces the overall μ . Our results can be utilized to study and improved channel conductivity in V-shape MODFET structures.

Classification of Faults in a Hybrid Power System using Neuro-Fuzzy Technique

Basanta K.Panigrahi, Bhagyashree Parija, Raturaj Pattanayak, Abhipsa Kiran, Satamanyu Nayak and Prakash K.Ray

Abstract: To improve the performance of micro grid it is imperative to detect the fault as soon as possible. Taking the above issue into consideration a peculiar technique for the classification of different types of faults has been introduced in the study of this paper with a micro grid consisting of Wind Turbine (WT) and diesel generator. For accurate classification of various faults all fault disturbances Neuro-fuzzy (NF) is implemented by taking the input feature information. One practically applicable 3-bus system incorporated with numerous types of distribution generations which are considered for the protection analysis purpose and using MATLAB/SIMULINK the simulation is done for the environment. The classification of fault is done using Neuro Fuzzy. The comparison results are presented which demonstrates the enhanced performance of Neuro Fuzzy (NF).

Fault Localization in a Hybrid Power System using Impedance, Wavelet Transform and Travelling Wave Method

Basanta K.Panigrahi, Raturaj Pattanayak, Bhagyashree Parija, Ritu Singh, Sourav K. Sahu and Pravat K. Rout

Abstract: Faults should be cleared on the transmission line as soon as possible. Smaller time for the fault clearing has many merits like less threat of damaging equipment's, reduced loss of income, better customer satisfaction due to improved quality and reliability of power supply. Fast restoration of supply is possible, if accurate location of fault method is used. This paper gives the basic idea of the fault location calculation using the impedance, wavelet transform and travelling wave based method in a DG based power system. One practically applicable 3-bus system incorporated with various types of distribution generations are considered for the protection analysis purpose and is simulated using MATLAB/SIMULINK environment. The location of fault is done using all the three proposed method.

The comparison results are presented which demonstrates the enhanced performance of both the methods.

GPS Position Correction using Differential Evolution Algorithm for Coastal region of Andhra Pradesh

G Sasibhushana Rao, Lavanya Bagadi and Nalineekumari Arasavali

Abstract: Global Positioning System (GPS) is mainly used in military, surveying, transportation and civil applications based on tracking and navigation principle. This paper considers a Differential evolution (DE) algorithm for estimating the GPS receiver position and aims to carry out the performance comparison with Genetic algorithm (GA). In order to improve the GPS receiver positioning accuracy, the DE based on stochastic method is adopted and fitness function is set up based on the square of error distribution of pseudo range observation values. It is observed that DE outperforms GA in finding the true global minimum and validation results show that DE guarantees a feasible solution in faster convergence rate than GA with high precision and is applicable for real time defense applications.

Online Condition Monitoring and Fault Analysis of Bearing of a Rotating Machinery using IoT

Sudarsan Sahoo, Chokka Upendra, Krishnananda Sahu and Nabajit Bharali

Abstract: In this era of Internet of Things (IoT), the world has become a futuristic timeline where objects are connected and communicating cheaply with each other across a global communication. The electronic devices generate enormous amount of data and internet makes the possibilities for interaction between devices is unlimited. The proposed work is to monitoring online the condition of a bearing of a rotating machine by using IoT and its fault diagnosis using frequency and time-frequency analysis. The proposed work using IOT is designed for monitoring the motor condition at a particular place and make the information visible anywhere on the earth. Here the things are referred to be the sensors and instruments which interacts with the IoT. The proposed system deals with monitoring the bearing conditions by monitoring the measuring parameters that is vibration, Sound and RPM with sensors and send the information to the web server and then plot the sensors data as graphical statistics and also reacting on Twitter accordingly. The data updated from the implemented system can be accessible in the internet anywhere on the earth. The data acquired from the web server is analysed by using the frequency (FFT) and time-frequency (wavelet) analysis in MATLAB to diagnose the defect in the bearing. In this work only vibration data is used in the analysis of fault in the bearing. In the analysis stage the vibration data acquired from the defective bearing is compared with the vibration data of the healthy bearing to detect the defect. The proposed work is a less expensive solution due to usage of cheap, low power sensors and SoC contained Wi-Fi module. Embedded controller sensor networks have proven themselves to be a reliable solution in providing remote control and sensing for bearing condition monitoring systems.

Design a Feedback-loop Arbiter for on Chip Communication Architecture

Akhil Gupta and Abhinav Kumar

Abstract: The SoC technology involves integration of different components like microprocessor, RAM, ROM, DSP etc. on a single chip. Overall performance of system on chip is determined by the

on chip communication architecture. Therefore an efficient communication architecture should present on the chip, so that on chip traffic issues can be handle efficiently. The manner in which the architecture decides which component will grant the bus from a bunch of requests coming to it has an utmost importance. Normally, the architecture used in the on chip communication is static priority, TDMA, CDMA etc. But these architectures have some flaws like starvation, large latency and do not provide proper bandwidth share to each component. This paper presents a modified lottery bus arbiter based on probability bus distribution algorithm. This method solves the problem of same master granting the bus for more than one consecutive cycles by using the feedback loop which acknowledge the arbiter about previous grants. It also solves the issue of starvation and provide proper share of bandwidth to each component present on the SoC. The architecture is implemented, simulated and synthesis in Verilog using Xilinx Artix 7 XC7A35TCPG236-1.

Routing in Vanets for Freespace and Tworayground Propagation Lossmodels

T.Nishitha, Kankati Sai Anurag, Dr. T.Adilakshmi and Md Rahamath

Abstract: Adhoc networks are local area networks(LAN) which are built to connect the devices. The term Adhoc implies spontaneous because these networks often bypass a router. Formed by wireless hosts like mobile and routes between the nodes may contain multiple hops. Vehicular ad hoc networks(VANETs) is a part of mobile ad hoc networks(MANETS)-where networks are created and tries to communicate, send information among the vehicles. We used the performance of OLSR and AODV using and FreeSpace, TwoRayGroundPropagationLossModel to evaluate Packet Delivery Ratio, Throughput, Overhead as metrics. The simulation results show that with varying speeds OLSR is suitable when compared to AODV.

Double E-shaped Wideband Microstrip Patch Antenna for Wireless Applications

Pradosh Kumar Hota, Manoj Kumar Panda and Dr. Debasis Mishra

Abstract: A wideband double E-shaped antenna with co-axial fed resonating at 5.21 GHz, 5.5 GHz, 5.85 GHz and 6.3 GHz is presented. The proposed configuration is intended to cater a wide range of bandwidth nominally upto 1.4 GHz which is the demanding performance parameter for wireless communication.

Speech Recognition Model for Assamese Language using Deep Neural Network

Moirangthem Tiken Singh, Partha Pratim Barman and Rupjyoti Gogoi

Abstract: The work presents a speech recognition model for the Assamese language of the state of Assam of India. We experimented the model on the digits of Assamese language. The Deep Neural Network is used to make the recognition model. The Long Short-Term Memory Network (LSTM), which is a special kind of Recurrent Neural Network composed of Long Short-Term Memory blocks is the primary layer of our neural network model. We also use Mel Frequency Cepstral Coefficients for choosing the speech features. Finally, the accuracy of the model is evaluated based on the recognition rate.

Line Formation by Swarm Robots

Arijit Sil, Sruti Gan Chaudhuri and Shankha Bhattacharya

Abstract: Swarm robot is a collection of tiny identical autonomous mobile robots who collaboratively perform a given task. One of the main objectives of swarm robots is to place themselves on a geographic region forming a particular geometric pattern in order to execute some jobs in cooperation, e.g., covering or guarding a region. This paper proposes a deterministic distributed algorithm for a set of tiny disc shaped swarm robots (also known as fat robots) to form a straight line. The robots are homogeneous, autonomous, anonymous. They need very less computational power. They sense their surrounding up to a certain distance, compute destinations to move to and move there. They do not have any explicit message sending or receiving capability. They forget their past sensed and computed data. The robots do not agree on any global coordinate system or origin. The robots are not aware of the total number of robots in the system. All these disabilities of the robots make them less expensive in cost as well as simple in software and hardware requirements. The algorithm presented in this paper assures collision free movements of the robots.

Facial Emotion Detection using Deep AutoEncoders

Siva Prasad Raju Bairaju, Sowmya Ari and Prof Rama Murthy Garimella

Abstract: In this research paper, we utilize deep autoencoders for detecting emotion with visual information. Interesting network architectures are proposed to improve the accuracy of emotion detection. Also, novel application of hybrid vehicle driving (not fully autonomous) is proposed. The implementation results are very promising.

Novel Microstrip Patch Antenna for WLAN and WiMAX Applications

P. Sanyal, M. Singha Roy P. P. Paul and S. Moitra

Abstract: The present work demonstrate a light weight, small size, low cost microstrip patch antenna embedded with bottomco-axial feeding technique along over a 26 x 24 x1.6 mm FR4 substrate with dielectric constant 4.4. An A-shaped patch antenna is designed for this purpose. The dimensions of coplanar arms are considered so as to adjust the antenna resonance at WiMAX 3.5GHz and WLAN 5.2GHz. The simulated S-parameters as well as the gain of the proposed antenna configuration are presented and discussed. The antenna is compact in size and with wider bandwidth. The overall impedance bandwidth of the proposed antenna is close to 3.663GHz. In addition to this frequency tuning of the proposed antenna is achieved by implementing two parallel slots at the rectangular ground plane.

An Improved HAPO Algorithm using GPU Harness (IHAPO-G) for Rapid Responses in VANETs

Vinita Jindal and Punam Bedi

Abstract: With the tremendous growth of the automobile industry, there is an urgent need of means for controlling the traffic congestion. Due to this congestion, there is an increase in total travel time along with the increase in both travel cost and pollution that have a remarkable impact on both economy of

the nation and health of the people. For the reduction of congestion, one needs a routing algorithm that is able to detect the congestion in advance and helps in avoiding the congested routes. To improve the problem of congestion, many algorithms have been proposed by researchers. As the speed of vehicles is very high, the algorithm needs to compute the results in minimum possible time. An Improved HAPO (IHAPO) algorithm is being used in literature to choose the best route by leaving the optimal, but congested path during peak hours in Vehicular Adhoc Networks (VANETs). In the paper, we are proposing an improved HAPO algorithm using Graphical Processing Unit (GPU) harness (IHAPO-G) in which all the phases of IHAPO algorithm are parallelized in order to provide faster computations by using the harness of GPUs. The proposed IHAPO-G algorithm is able to speed up the computations of existing IHAPO algorithm and the CPU and GPU implementations of its counterparts. After using the proposed IHAPO-G algorithm, there is a noteworthy decrease in overall travel time under heavy traffic conditions.

Power Quality Improvement in Microgrid with Renewable Energy Resources

Parth D. Patel and Nilay N. Shah

Abstract: This paper present the power quality analysis of micro-grid. Here, three various system of micro-grid are taken namely, PV-Battery system, DFIG system, Hybrid (PV, Wind, and Battery) system to show the importance of DFIG and its in-built converters. All the three systems have been modelled and simulated separately. The THD of such systems have been evaluated. In Hybrid System, DFIG Grid Side Converter (GSC) has been also utilized as an inverter of PV System which reduced the cost of one converter as well as improves the power quality.

Industrial Surveillance Video Analysis using Compressed Sensing

Unnikrishnan K T and Dr Byjubai T P

Abstract: The development of complex video surveil- lance and traffic monitoring systems has recently attracted interest from the industry and research community due to increased availability of low cost sensors and processors and increasing concerns for safety and protection This paper offers a novel video analysis method based on the Compressed Sensing and Gaussian Mixture Model shadow removal. Compressive sampling or Compressed Sensing is a new signal acquisition technology that can almost take over Nyquist sampling method. The shadow of moving object present in the video stream is first removed by GMM Shadow removal method. Every frame is then sensed or sampled by Block compressive sensing (BCS) using a random Bernoulli's matrix as sampling matrix. For further data reduction compressive sampling in different transform bases like DFT,DWT-haar, DWT-Db are carried out. Key frames are reconstructed using the algorithms l1 minimisation, Matching Pursuit, Block Sparse Bayesian Learning algorithms.Simulation results demonstrate that Block Sparse Bayesian Learning algorithm based recon-struction outperform other techniques.

Advanced Embedded System for Identification of Asthma

Nitin S. Ambatkar, Dr. S. D. Chede and Vyankateshwar G. Girhepunje

Abstract: Asthma is a chronic lung disease and its early detection is required. The conventional method for asthma detection uses a stethoscope for lung sound analysis, but has disadvantages; Requires expertise, Sense of hearing, Lacks recording, Low sensitivity, No statistical description, Reduces the Strength of frequency of sound above 120 Hz and the human hearing capability has low

sensitivity to the lower frequency components. The Embedded system developed for detection of asthma is a very novel approach for detection of asthma with an accuracy of 86.6 %. This system contains an Instrumentation Amplifier for initial amplification of lung sound and band pass filter to remove unwanted heart signals from lung sound signals. The Wavelet Packet Transform (db3, coefficients 5, 29) applied to signals at the output of the filter to compute different feature vectors and with the help of these, we trained the Artificial Neural Network to identify asthma. But again we can improve this system by reducing Hardware, Software (code length) and Computational Power. This paper presents improved lung sound analysis based Low Power, Low Cost, Embedded System for Identification of Asthma. Here Wavelet Packet Transform (Haar, coefficients 7, 69) directly applied to lung sound signals at the output of Instrumentation Amplifier which blocks the need of band pass filter and reduces electronic hardware and down sample lung sound signals. Moreover, by applying a threshold to the output of Wavelet Packet, we can decide whether the patient is asthmatic or not. This also blocks the use of Artificial Neural Network which reduces the code length and computational power as compared to Wavelet Packet Transform (db3, coefficients 5, 29). It is seen that this new improved system has 20% hardware reduction, 30% code length reduction, 45% computational power reduction and an accuracy of 88%. This improved system using MSP430G2 mixed signal microcontroller consumes only 361 μ A from 3V, 350mAh AA NiCd Rechargeable battery, i.e. very less power and do not require Band Pass Filter and trained Artificial Neural Network.

Biosensor Mobile Node Network: New Technology to Enhance Agriculture Crop Productivity

Virendra K. Taksande, Vyankateshwar G. Girhepunje and Manoj K. Demde

Abstract: Biosensor mobile node networks represents system of mobile biosensor nodes that can self-organize freely and dynamically into arbitrary and temporary network topology. Network routing is the task of directing data packets for biosensor from a source to a given destination. Mobile biosensor wireless network with IEEE 802.11 MAC protocol can be used for monitoring agriculture crop, to improve their productivity and can be used to provide information about latest technology on agriculture to the farmer. This paper provides experimental and analytical observation of increase in productivity of rice crop when it is treated with mobile biosensor network with biotechnology.

Automatic Irrigation and Soil Quality Testing

G Nithin Reddy, Mohammad Danish, Yadala Syam Babu and Dr. G Koperundeivi

Abstract: Agriculture is a field that uses a lot of water. Most of the time, this resource is not used efficiently and substantial amounts of water are wasted. Farmers tend to use more water than required by manual techniques hence wasting them. Moreover time is also being wasted to test the quality of soil for crop laying as the soil needs to be tested in the lab for the minerals, pH content etc. for which they need to submit the samples of soil to the laboratory. The present era farmers in India have been using the manual control irrigation technique in which the farmer irrigate plant at regular interval of time. Improper watering may cause immature growth of crops. Also, the crop needs fertilizers based on different soil types for which the soil sample is tested in the laboratories for mineral content. These problems are addressed in the proposed system. In the proposed system irrigation take place only when there is a requirement of water. Also, if the soil quality is required to be tested for the type of crop, it can also be displayed with all the necessary details of essential nutrients which are Nitrogen, Phosphorus and Potassium.

Testing and Diagnosis Faults in Finfet Circuits based on Advanced Test Algorithm

K.V.B.V.Rayudu, Dr P Srihari Rao and Dr. K S R Krishna Prasad

Abstract: FinFET transistors are used in major semiconductor organizations which plays an important role in the development of the silicon industries. Due to few embedded memories and other circuit issues the transistors have specific faults in manufacturing, designing of the circuit etc. This paper presents an advanced test algorithm to diagnose those faults. The circuit with different gates is designed to identify the places having faults. In addition, two different algorithms such as non-incremental computing algorithm and Adaptive Genetic Algorithm algorithms are used to find the fault location and critical path. The transfer characteristics curve is plotted along with the delay curve which helps in finding out the simulation parameters such as noise margin, propagation delay. The results in the methodology calculates the probability density function of the critical path by estimating mean, standard deviation and variance. The advantages of the integration of the two algorithms in this paper helps in analyzing the specific faults in the circuits and the error correction of the broken link in the path analysis and has enhanced performance. Furthermore, more complicated circuits are analyzed for fault detection with different approach

Congestion Management of Power Transmission lines: A Survey on Techniques, Methodology and Approaches

Sourabh and Dr. Gagandeep Kaur

Abstract: Globally power industry is slowly moving towards the restructuring and deregulation. Restructuring of power industry is wider alteration and has introduced the concept of electricity as commodity and price based power market, which simultaneously achieving the reliability and quality of power. The deregulated electricity market faces lots of challenge and among there, one is congestion of lines. Congestion rises due to competitive power market environment in which tendency of each participant is to get maximum benefit. Congestion has created the threat to reliability and power system security through violation of transmission capacity limits of line. This paper reviews some of important methods, techniques and approaches used by various researcher for management of congestion of lines. The pivotal role of conventional FACTS devices for immediate relief of congested lines and artificial intelligence techniques are the modern concept mentioned in this review work.

Use of the PMU Infrastructure to Determine the Location of Short-circuit Power Lines

Konstantin Suslov, Nadezhda Buryanina and Elena Lesnykh

Abstract: One of the serious problems of the normal operation of power systems is a violation of efficiency of overhead power lines. Short circuits are especially dangerous. The probability of occurrence of faults is reduced, but not reduced to zero, with an increase in the quality of installation, reliability, insulators and conductive materials. The proposed method is based on the fact that the short circuit current at the beginning of the transmission line of power electric system depends on the distance (location) to the fault point. This article discusses the following topics: theoretical possibility of fault location on the time of arrival of the responses to the beginning and end of the line, the development of the algorithm processing of information, the development of the block diagram of

additional devices that are not included in the phasor measurement units (PMU). The article gives an example of the application of this technique.

Design of PID Controller for Load Frequency Control of One Area and Two Area System using Firefly Algorithm

Neelesh kumar gupta, kasi reddy idamakant and Arun kumar singh

Abstract: An interconnect power system is often divided into different control area as they are operated by different utilities. These areas are connected by one or more circuit with help of transmission line which are called tie line. For proper operation system frequency should be kept near constant and power flow between different areas should control at scheduled value despite the deviation of load in different area. Power systems are considered with Proportional-Integral-Derivative (PID) controller as a auxiliary controller. The PID controller parameter are optimized by considering nature bio-inspired Firefly Algorithm which is known as FA-PID. The simulation results verified the comparison of the proposed system performance (FA-PID) with Integrator for the same investigated power system. The proposed system based on FFA achieved the least settling time as compared to Integrator, while, it attained good results with respect to the peak overshoot/ undershoot. In addition, the FA performance is improved with the increased number of iterations.

Comparative Analysis of Various Phasor Estimation Techniques used in Transmission Line

Aniket Hattarge and Uday Sarode

Abstract: Fault analysis is important consideration in deciding the adequacy, selectivity of power system protection schemes and overall system reliability assessment. In power system protection relays, quick fault detection is important so that defective phase can be disconnected quickly, so to achieve this task its highly important to obtain the fundamental phasor component. Along with the fundamental component measured fault signals comprises of harmonics, dc offset and noise. So protective relays must filter their inputs to reject unwanted entities. A comparative review of different phasor estimation techniques is described for fault analysis purpose. The different algorithms are implemented in MATLAB/SIMULINK software and performances of these implemented algorithms are compared using different performance indices.

Rate Distortion Optimization using Edge based Quad Tree with Threshold on Edges for video coding

Rajender Kumar, Dr Amit Kant Pandit and Krishan Kumar

Abstract: Most popular and latest video coding standard i.e H.264/AVC strives to reduce spatial and temporal redundancy. It is clearly stated in literature that 89.2% computational power is consumed by motion estimation & hence reducing computational complexity and rate distortion performance has been the research topic in recent years. In this paper, one of the techniques used for achieving optimal Rate distortion performance & computational complexity is quadtree which computes the optimal selection of variable size blocks by counting the number of edges present in the current frame. In this paper, we have first discussed the different parameters such as Lagrange optimization function, skipping, Merging, Pruning and quantization parameters and also efforts made towards the reasonable combination of the above so that optimal solution of rate-distortion problem can be achieved. A new

modified quad tree decomposition algorithm depending on some threshold value on edges is proposed in second part of the paper. The experimental results show that number of iterations has been reduced drastically from 5376 to 1260 using threshold value of 20 for edges present in current frame. The rate distortion performance for five different path is also shown for threshold value of 20 and ordinary quadtree decomposition algorithms.

A Review on Fault Tolerant Control in Benchmark Challenge of Wind Energy Conversion

Shrabani Sahu and Sasmita Behera

Abstract: The utilization and demand of wind energy conversion systems (WECS) are increasing day by day. So it is necessary to make the system more reliable, efficient and cost effective. It can be fulfilled by exploiting some advanced technologies which are easy to implement and much more proficient. In the past decade several good research works is going on control techniques and fault tolerant control (FTC) methodologies based on benchmark challenge of WECS. Some recent contribution in the field of fault detection and diagnosis (FDD) and FTC approaches are analyzed and presented in this paper.

A Genetic Algorithm based Parameter Extraction Method for a PV Module

Raseswari Pradhan and Abhipsa Kiran

Abstract: This paper presents parameter extraction using Genetic Algorithm (GA) for Photovoltaic (PV) system. The efficacy of the MNR method has been compared with two other approaches such as Villalva's Numerical Iterative method. Here, for study of the above two techniques, a 200W PV array called KC200GT has been taken as case study. With the help of MATLAB/SIMULINK domain, the performance of this studied PV model has been realized with the help of different simulation results. In this study, a single-diode five-parameter type model has been considered. The parameters are extracted under Standard Test Conditions (STC) considering the data of open circuit voltage, short circuit current and maximum power point voltage and current from manufacturer's datasheet values. Comparative assessment of the above parameters extraction methods indicates that the GA method provides accurate results with simple calculations and quick convergence.

RCP Prediction in Cellular Networks using Normalized Percentile Dwell Time

Prateek, Swati Swayamsiddha, Sudhansu Sekhar Singh

Abstract: This paper proposes Normalized Percentile Dwell Time Distribution for predicting the Reporting Cell Planning (RCP) in cellular networks to aid in Location Management. Dwell time parameter is critically dependent on users' behavior within the network. The innate advantage of Normalized Percentile dwell time over the conventionally used absolute dwell time is that it can take only fixed values depending on the number of cells per network area. This helps tremendously in reducing the computational overhead and can be applied to any shape of the network as long as the total number of cells per network remains constant. Consequently, the proposed percentile dwell time has been used to determine the optimal reporting cellplanning configuration for 4x4, 6x6, 6x8, 8x8 and 10x10 networks.

Three-phase Induction Motor Performance on One Coil Short in Stator Winding: - Modelling and Simulation

Sharad S. Dhamal and Dr. M. V. Bhatkar

Abstract: In this paper, the mathematical model of Three Phase Induction Motor is studied and from this the model for the one coil short fault in stator winding is derived. First the model is derived for the balanced conditions and then it is for unbalanced conditions by shorting the one coil of phase c in stator winding. The performance on both the conditions is presented. It is well known that the stator winding faults such as interturn short circuit are the most common source of breakdowns in induction motors. The early detection of any small inter-turn short circuit fault during motor operation would eliminate some subsequent damage to adjust coils and stator core, reducing the maintenance costs. In present paper the performance on balanced supply condition and one coil short of phase c by MATLAB simulation is discussed.

Implementation of Multiple Slots Patch Antenna Array with using Quarter wave Feed Network for WLAN Applications

Dr.D.Prabhakar, P.Santosh, Dr. M.Satyanarayana and Dr. P. Mallikarjuna Rao

Abstract: Microstrip Slot Antennas (MSAs) have the advantage of being able to produce bidirectional and unidirectional radiation patterns with reasonably good bandwidth. Microstrip and slot combinations offer an additional degree of freedom in the design of microstrip patch antennas. In the present work, the design of microstrip patch antenna array with multiple slots using Quarter wave feed is considered. It is simulated and analyzed in detail by using Quarter wave feed network which is used for WLAN applications in ISM frequency bands. To accomplish this work HFSS 13.0 version tool is used and its fabrication is done by using photolithography technique devised by FR4 Epoxy-substrate. In this work the antenna parameters like gain, resonant frequency, reflection coefficient and VSWR are evaluated theoretically and measured by fabricating the prototype unit. The results are presented at the end.

Improved Topical and Trust based Page Ranking for Web pages using Trust Features

L.Smitha and Dr.S.Sameen Fatima

Abstract: For many people, finding the information is a daily activity on web, availability of the data on the web has helped many users in obtaining their information need. Scientist are coming up with good and faster ways to find relevant information. Topic and Trust becomes important elements of data retrieval framework. Because of the extent of the web, it is basic to have positioning capacities that satisfy the user's needs. To this end the Web offers a rich setting of data which is communicated through the hyperlinks. This paper presents the idea of improving Page Rank, "Improved Topical and Trust Based Page Ranking for Web pages Using Trust Features" to filter out malicious sites which has vast limit as contrasted with conservative Page Rank Algorithm.

Applied Communication Technology to Support Tourism Web Collaboration at Provincial Level in Indonesia

Sulistyo Heripracoyo and Suroto Adi

Abstract: Basically tourism websites were developed for the purpose of disseminating information on tourism products and attracting tourists to visit tourism destinations. Tourism business is not a single business but there is number related business such as transportation, hotel, culinary, and tour and travel as well. Currently, at the provincial, and the office of tourism and the business actors have owned website but their websites were generally built apart from each other. So that, indirectly the existence of the website has not been optimal in boosting the increase in the number of tourists visiting Indonesia. The current communication technology enables to support collaboration between websites so as to increase access the tourism promotion and marketing. This paper aims to see the potential benefit of communications technologies that currently available to enhance web collaboration among web business actors. The method used is literature study, tourism legislation study, and field survey. The expected result is the design of the usage web communication technology which potentially increases the effectivity of tourism websites at the province level.

Ortho rectification of Resourcesat-2 AWiFS Data using FFT Phase Correlation Technique

M Suresh Kumar, R N Anjani, Ch Venkateswara Rao and B Gopala Krishna

Abstract: NDVI full India mosaic is generated from Resourcesat-2 AWiFS data for every 5 days at the resolution of 56 meters for crop inventory and drought assessment. Around 70-80 quadrant scenes are needed to be ortho rectified for the generation of one cycle full India mosaic file. The input geo-ortho kit products are having location accuracy of 2-3 pixels. So manual registration to bring into pixel level accuracy is required for temporal consistency between all products. Here, FFT based phase correlation matching algorithm is attempted to register the images in automatic fashion to sub pixel level. The results are discussed in detail.

NS3TCG: NS3 Topology and Code Generator

Rishav Halder, Sridhar Mundra, Uttaran Dey, Sreejita Ghosh, Sreeja Karmakar and Raja Karmakar

Abstract: Construction of Network Simulator version 3 (NS3) code and topology in easy and quick way are one of the main issues. In the world of computer networks, network simulator acts as a program to simulate network from which we can realize the behaviour of a network. In this modern era, the computer networks are getting complex which are becoming difficult to understand and to implement the network in NS3 platform. Our designed NS3 Topology and Code Generator (NS3TCG) tool can minimize the difficulty level as it can construct topology and generate NS3 code in C++ language, with minimum number of inputs about the network like, numbers of nodes, Internet Protocol (IP) address, Wireless or Wired or Mixed Network, delay rate, etcetera (etc). Our networking tool works mainly on two algorithms; one to dynamically generate NS3 code where as the other, to dynamically construct network topology. With the help of Graphical User Interference (GUI), we can understand the structure of any complicated network very easily and on the other hand, NS3 code generated by our tool can be further compiled and executed to obtain the simulation of the topology. As per our knowledge, NS3TCG is the first work in the direction of generating NS3 code and topology, which makes our networking tool unique and innovative.

Prognosis of Liver Disease: Using Machine Learning Algorithms

Vyshali J Gogi and Dr. Vijayalakshmi M.N

Abstract: the process of identifying patterns in huge datasets comprising methods such as machine learning, statistics, and database system can be considered data mining. It is a multidisciplinary field in computer science and it extracts knowledge from the massive data set and converts into comprehensible format. The Medical environment is rich in information but weak in knowledge. Medical systems contain wealth of data which require a dominant analysis tool for determining concealed association and drift in data. The health care condition that comprehends to liver disorder is termed as Liver disease. Liver disorder leads to abrupt health status that precisely governs the working of liver and intern affecting other organs in the body. Data mining classification techniques like Decision Tree, Linear Discriminant, SVM Fine Gaussian and Logistic Regression algorithms are applied. Laboratory parameters of the patients are used as the dataset. Data contains features that can establish a rigorous model using Classification technique. MATLAB2016 is used in this paper for implementing classification algorithm on the dataset. Linear Discriminant algorithm showed the highest prediction accuracy 95.8% and ROC is 0.93.

SSR Mitigation with Damping Controller using STATCOM

Sangeeta Samantara

Abstract: Series compensation is increasingly considered for increasing the transmission capacity of the transmission line. It can cause shaft fatigue and possible failure or damage of generator involved. Series passive compensation and shunt active compensation provided by a static synchronous compensator (STATCOM) connected at the electrical center of the transmission line are considered in this report. It is possible to damp subsynchronous resonance (SSR) caused by series capacitors with the help of a damping controller on STATCOM. The study is performed on the system adapted from the IEEE second Benchmark Model. Rotor speed deviation is observed and compared on second benchmark model taking with STATCOM and without STATCOM. The complete simulation of the STATCOM is performed in the MATLAB/Simulink environment.

Processing of Silicon Heterojunction Solar Cell and its Secondary Ion Mass Spectrometric Characterization

M. S. Siddiqui, Vinayan Bhardwaj, A. K. Saxena, S. P. Singh

Abstract: Hetero junction with intrinsic layer (HIT™ is a trademark of Panasonic Ltd.) solar cell technology is a recent technology and has been successfully demonstrated for solar power generation by M/s Panasonic Ltd. In Heterojunction solar cell the junction is formed between amorphous silicon and crystalline silicon wafer. The major advantage of Heterojunction solar cell is that it offers higher Voc because of band bending. The reported highest efficiency of Heterojunction solar cell is 26.6 % by M/s Kaneka Corporation (heterojunction back-contact crystalline silicon solar cell). This paper discusses the processing of HIT cell and their Secondary Ion Mass Spectrometric (SIMS) characterization. The IV curve shows very high series resistance which are explained with the help of SIMS data.

Review on Fetal Heart Rate Variability

Dr.M.Malini, A.Usha Sri and G.Chandana

Abstract: Fetal Electrocardiogram signal contains precise information which can assist clinicians in making appropriate decisions during labor. Computerized fetal heart rate analysis reveals multiple

parameters of fetal well-being and diagnoses fetal distress. The extraction and recognition of fetal ECG signal from abdominal signals with technologies and methodologies are becoming important. The purpose of this paper is to review various methodologies for fetal ECG signal extraction. Analysis of these methods provides efficient and effective ways of interpreting the fetal ECG signal and take appropriate clinical decisions.

An Efficient Radial Basis Functional Network Optimised by Firefly Algorithm for Stock Market Forecasting

Ajaya Kumar Parida, Sthita Prajna Mishra and Nirupama Parida

Abstract: This paper represents an efficient learning algorithm for the stock market prediction. In this paper a novel technique known as radial basis function neural network (RBFNN-FF) which is further optimized by firefly algorithm for better accuracy. In order to prove this algorithm a better approach, other two algorithms known as Chebyshev neural network (CNN) and basic extreme learning machine (ELM) has been described in this paper. A comparative analysis has been done for all three algorithms which are depicted in the result section of this paper. The observations are made for different periods of time to know the superiority of the algorithm.

A Deep Learning Approach for prediction of Software Defects using Principle Component Analysis & Neuro Fuzzy Inference System

Satya Srinivas Maddipati and M Srinivas Rao

Abstract: Identifying Defective prone modules in a software is one of the most attractive topics in the field of Software Engineering and Soft Computing. Many researchers applied various machine learning algorithms on identifying defective prone modules in software. In this paper, we are applying a deep learning approach for Software Defect Prediction. We applied principle component analysis as a feature selection algorithm to identify most relevant features in software defects. Later, a Sugeno Fuzzy Inference system was derived by using Adaptive Neuro Fuzzy Inference System algorithm. The performance of the derived Fuzzy Inference System was compared with the classifier used in literature survey. We observed Area under ROC curve has been improved with Sugeno Fuzzy Inference classifier compared to the classifiers Neural Networks and Support Vector machines etc.

Comparative Study of Different PWM Techniques used for Five-level Cascaded H- bridge Inverter based DSTATCOM

V.ChandraSekhar and K.Krishnaveni

Abstract: This paper presents the comparative study of a five level cascaded H bridge inverter used as a DSTATCOM, for different Pulse Width Modulation (PWM) techniques and with instantaneous reactive power control method which improves power factor. Voltage sourced converter based DSTATCOM has been established as the most preferred solution for management of reactive power in distribution utilities and for improving voltage regulation, power factor and power quality in industries. Cascaded H-Bridge converter shows superior performance than the two-level inverter in most of the medium and high power applications. The dc link voltage and the three phase load currents are used as feedback signals for the controller and it is designed in such a way that DSTATCOM is able to supply the reactive current demanded by the load for steady state conditions. Simulation studies

have been carried out to study the performance of the proposed five-level inverter with the above mentioned control strategy. The results are tabulated for quantitative analysis. All the simulations were executed using MATLAB/SIMULINK.

A Novel Approach for Data Classification using Neural Network

Debasis Gountia, Suvendra Kumar Jayasingh, Ranjita Champati, Prakash Kumar Chinara, Ashish Kumar Pradhan and Neelamani Samal

Abstract: In this paper an approach of multiview learning with multilayer perceptron (MLP) and radial basis functions (RBF) with dynamic decay adjustment (DDA) has been proposed. There are three types of semi supervised learning: self-training, co-training and multiview learning. Here we have only used self-training and multiview learning mechanisms to train the classifier. In order to test the accuracy of the algorithms we have taken five real time datasets form UCI Machine Learning Repository. The classifier is trained using perceptron learning rule (MLP) with its supervised and semi-supervised (self-training) version and MLP with RBF (Multiview Learning). The average classification accuracies have been compared and it has been found that the proposed algorithm outperforms the former versions on the specified training sets. The noticeable improvement in performance obtained using multiview learning can be used for various fields like detecting changes of images, speech recognition, biometric identification etc.

Performance Analysis of P-V and Q-F Droop Control Strategy in an Islanded Resistive Microgrid During Partial Shading on Photovoltaic Plant

Binoy Kumar Karmakar and Ashok Kumar Pradhan

Abstract: Droop control is used for power sharing among different generating units without using a dedicated communication channel among them. In transmission systems, lines are inductive where, real and reactive power flow are proportional to the angle and the difference in magnitude of the bus voltages, respectively. On the other hand, a microgrid connected with cables is a resistive network. Therefore, a power-frequency and reactive power-voltage (P-F, Q-V) droop used for transmission system cannot provide desired steady state and transient performance for an islanded resistive microgrid, as reported in literature. In the presence of a solar photovoltaic (PV) plant in a microgrid, conventional (P-F, Q-V) control strategy may not perform well. This work uses power-voltage and reactive power-frequency (PV, Q-F) droop control strategy for load sharing in a resistive microgrid and compared its performance with the conventional (P-F, Q-V) droop to handle partial shading associated with solar PV generation. Simulation results show that (P-V, QF) droop method provides better power sharing option than the conventional (P-F, Q-V) droop method even during partial shading.

Passive Filter Design to Mitigate Harmonics in Three Phase Uncontrolled Rectifier

Wategaonkar Suraj S., Patil Swapnil S., Pradnya R. Jadhav

Abstract: In power supply system, quality is most significant factor. The widespread use of nonlinear loads such as information technology equipment, personal computers, UPS system, frequency converters, adjustable speed drives(ASD), rectifiers play major role in the declining in the quality

power. This paper represents a harmonic contents in three phase uncontrolled rectifier is analyzed by using KRYKARD ALM 36 three phase power quality analyzer. The valuation of harmonic distortions is associated with IEEE standard 519-1992 at the point of common coupling. Simulation of shunt passive harmonic filter is done with the MATLAB SIMULINK toolbox. The simulation demonstrations some outputs and FFT analysis of with filter and without filter. As well as hardware of shunt passive harmonic filter is implemented and results are discussed.

Hardware Implementation of Cascaded H-bridge 5-level Inverter using SPWM Techniques

Patil Swapnil Sanjay, Patil Rupali Tanaji and Prof. Patil S. K.

Abstract: The most preferable and reliable configuration among many types of inverters Cascaded H-Bridge Multilevel Inverter is used. This configuration is easy to implement, more reliable, simple in design and gives good quality performance. This paper describes about Cascaded H-Bridge Multilevel Inverter, PWM techniques and hardware implementation. The simulation results are carried out on MATLAB SIMULINK. The hardware of inverter is also implemented by using MOSFETs and the Multicarrier SPWM pulses are generated through microcontroller STM32 which is 32 bit microcontroller. The THD is compared between simulation and hardware and comparison is discussed. Simulation and hardware results are shown.

Microcontroller based Sinusoidal PWM of 2-Level 3-Phase Voltage Source Inverter

Gurav Rutuja D., Morey Suryakant B. and Dr. P. M. Joshi

Abstract: This paper is mainly based on design and development of three phase two-level Voltage Switching Inverter in MATLAB PROGRAMMING/ HARDWARE RESULTS Using Sinusoidal Pulse Width Modulation (SPWM) Scheme. PWM signals are used for a wide variety of control applications. The frequency that the PWM signal needs to be set at will be dependent on the application and the response time of the system that is being powered. In SPWM technique, Two signals are compared. The carrier signal (triangular) is compared to the reference signal (pure sinusoidal modulation), whose frequency is the desired frequency. The width of the pulses are modulated to provide gate signals to the switches (IGBTs/MOSFETs) connected in the inverter. When the amplitude of pure sine signal (A_m) is greater than triangular signal (A_{cr}) then pulses are active high and ($A_{cr} > A_m$) then pulses will become active low. The output of SPWM inverter gives lower Total Harmonic Distortion.

Microcontroller based Implementation of Three Phase Two Level Voltage Source Inverter using Space Vector Modulation Scheme

Suryakant Morey, Rutuja Gurav and Dr. Prasad. M. Joshi

Abstract: This paper gives brief idea about design and realization of space vector pulse width modulation to produce cyclic pattern PWM inverter signals for driving three phase voltage source inverter. There are different PWM schemes for regulating output voltage and frequency of I.M motor but SVPWM is customarily used because it is more advanced method for generating sine wave with lower total harmonic distortion (THD). Use of this method is increasing rapidly in recent year because it is easier to execute this method and it requires less operational time for calculation. In this paper, general purpose three phase two level space vector voltage source inverter (VSI) has been analyzed

and executed completely in a single chip Atmel 89c51 microcontroller. The outcome of three phase two level VSI has been demonstrated by using simulation and hardware results of this scheme.

Narration of the Revolution of Humanoid Robot

Md Nasfikur R. Khan, Faisal Bin Shahin, A Muneem Al Hasani, Anik Shekar Dutta, S K Adif Farhan and Kuraish Bin Quader Chowdhury

Abstract: This paper represents the chronological order of humanoid robots segregated into 3 perspectives, for example its current, its previous and its imminent time. This paper features the potentiality for the genesis of the first few humanoid robots to the current ones and the future creation. This paper also shows the advancement of humanoid robot and its specific application from the perspective of human race. The paper has three segments as said above. The primary segment comprises of the current or present status about humanoid robots under the area of copying the many-sided quality of the movement of human hand, biomechanics and other human capacities such as walking and swimming. This segment also involves about the detecting strategy for a humanoid robot. This journal also shows the progress of humanoid robots in the field of cerebral paralysis, autism Spectrum and neurodevelopment disorders. The second segment includes the previous or past existence humanoid robots; the starting ideas that prompt the possibility of humanoid robot in real life alongside the development in bipedal kinesis and in natural observation. The third segment comprises of the forthcoming future Improvement in the field of humanoid robots. The challenges in the current methods for the movement of humanoid robots and the further conceivable future movement of humanoid robots is explained in the third segment. In the last segment, human to humanoid control is advised together with other innovation like grasping force. It also demonstrates the pattern towards the exploration in mechanical autonomy on the way to the advancement of humanoid robots utilizing the contemplative framework using artificial intelligence(AI). In the last part of this journal, the list of humanoid robot developments as to comprehend the profundity of progress in the field of humanoid robots and the significance of humanoid robots in the current and imminent time.

Comparative Analysis of Conventional and Modified H- bridge Inverter Configuration

Chithaj Mallikarjun, Niteesh S. Shanbog and Sangeeta Modi

Abstract: In this paper a comparative analysis is presented for conventional and modified H Bridge configuration of 5 and 7 level inverter. A modified H Bridge converter utilizes less number of switches for the same level output as compared to the conventional H-Bridge configuration. The lower number of switches will result in reduced switching losses, installation cost and converter cost. MATLAB/SIMULINK software is used for simulation of the different configurations used for the comparison. R and RL type of load is used and the corresponding voltage waveform is analyzed for its harmonic content. It can be seen from the results obtained that the Total Harmonic Distortion (THD) in the modified and conventional 7 level configuration is less than that of the 5 level inverter configurations.

Web Service Discovery Approaches of Semantic Web- A Review

Ajay Kumar, Dr. Naresh Chauhan, Dr. Jyoti

Abstract: Web Services are kind of logical pages which are independent and these services are used to develop the large scale non centralized systems. Due to Service Oriented Architecture of web services,

they play a big role in applications which involves transactions. Now days, due to more usage of these applications, the Web Services are also increased, so it becomes a challenge to the requester to find the best service that fits his requirements. The component of Semantic Web Services i.e. Service discovery is used to fetch the most desirable service which matches the query of user. In literature of discovery of new generation web services, various methodologies have been adopted. The paper classifies all of them on the basis of merits and limitations of each. It also provides the comparison of all the methods of service discovery to select best method which helps the user to find best service.

OFDM and VSC-OFDM Systems

Mr. Sidramayya S M and Dr. Ramesha K

Abstract: Orthogonal Frequency Division Multiplexing (OFDM) has recently used in wireless communication due to its high transmission rate. The basic principle of OFDM is transmission of multiple orthogonal signals simultaneously over a single transmission path. Conventional OFDM system is very sensitive to carrier frequency offset (CFO) and IQ imbalance due to this Inter Carrier Interference (ICI) is produced which degrades the output performance. Proposed Variable Sub-Carrier OFDM (VSC-OFDM) system is very less reactive to CFO and IQ imbalance due to this ICI is less in VSC-OFDM. Hence output performance of proposed VSC-OFDM system is better than conventional OFDM system. In this paper we have discussed the operation and performance of OFDM and VSC-OFDM systems in detail.

Modeling, Analysis and Simulation of Two-level and Three-level Voltage Source Converter for HVDC System

G. Surendhar, K. Krishnaveni and B. P. Muni

Abstract: With the development of power electronics technologies, control techniques and equipment, a new generation of HVDC technology based on Voltage Source Converters (VSC-HVDC) has evolved and becoming popular for power transmission under the sea and with underground cable. VSC-HVDC converters consist of Insulated Gate Bipolar Transistors (IGBT'S) switches, these IGBT switching devices work with high frequency Pulse Width Modulation (PWM) to get high-speed control of both active and reactive power and to create the desired output voltage waveform. This paper presents modeling, current control scheme and results of simulation studies on two-level and diode clamped three level inverter based VSC-HVDC system. Comparison of %THD for two-level and three-level VSC-HVDC system is also presented at the end.

Performance of MIMO Systems using Maximal Ratio Combining over Weibull Fading Channel

Shaik Mahammad Shakeer and D.Lalitha Kumari

Abstract: "Multiple Input Multiple Output (MIMO)" wireless systems are perceived an important reorganization for upcoming wireless systems. The performance of communication systems regarding their spectral efficiency and ability is enhanced as a result of MIMO systems. The required transmit power as for desired Bit Error Rate (BER) has been furnished in combination with appropriate receiver diversity. The study exposed that MIMO is a further efficient energy system since accomplished a decent BER performance at low SNR, when compared with SISO, SIMO and MISO which needs high SNR to accomplish at appropriate BER performances. The multiplexing gain experienced in the multiple antenna strategies utilizing the Space Time Block Code (STBC) and Maximal Ratio Combining (MRC). The impacts of number of transmitter and receiver antennas on the MIMO

system's BER performance over Rayleigh, Rician and Weibull channels with STBC transmitter and MRC receiver is analyzed. The BER performance characteristics of MRC receiver is explored for Quadrature Phase Shift Keying (QPSK) modulation.

Design of Enhanced PID Controller using Improved Cuckoo Search Algorithm

Amit Mondal, Sudipa Dutta, Trisha Ganguly, Megha Chatterjee and Shayak Ghosal

Abstract: One of the utmost challenge in conventional control engineering is to gratify the glitches, which are categorized by numerous objectives. In modern control system, monitoring and physically altering the operating conditions of a dynamical system has been done using an efficient controller to achieve a consistent, governable and steady system. PID (Proportional- Integral-Derivative) controllers have been used because of their strong performance enhancement applications using the basic three parameters i.e. the proportional gain, the integral gain and the derivative gain which have to be tuned for achieving an optimized control performance. In this article, an attempt has been made to design an Improved Cuckoo Search (ICS) algorithm and hence enhanced convergence performance has been noticed. In this regard, numerous benchmark functions have been considered. Moreover, amended system performance has been witnessed using Improved Cuckoo Search (ICS) algorithm by varying gain parameters of PID controller. Finally, the response of the proposed Improved Cuckoo Search (ICS) optimized PID controller has been compared with Cuckoo Search (CS) optimized PID controller and conventional PID controller.

Multi-Level Security Victimization QR Code, Bioscience and Positive Identification for Security Systems

Shubham Yadav, Manish Verma, Manish Kurre and Assistant Professor

Abstract: In recent times , several scams like Card Skimming, Shoulder aquatics, pretend PIN Pads , Phishing, etc ., we tend to re disbursed by some anti- social components . Not solely in ATM's, however additionally in bank lockers, balloting machine's, etc. This aims to imp rove the safety level exploitation bio metrics as primary authenticating issue comprising of Fingerprint and Iris primarily that reduces the probability of above mentioned cyber threats. For providing a high level security in authentication QR code scanner, fingerprint reader, Iris scanner and a PIN pad to enter the password are used. An identification number and fingerprint will be simply taken from the user, exploitation thermal cameras or different suggests that for PIN; and colloid or by different suggests that for fingerprint. An extra Bio metric specifically, Iris recognition uses an iris pattern that can't be stolen as easier as fingerprint. Additionally, ATM cards are replaced with QR code primarily based ATM cards to avoid malfunction like mismatching of Bio metrics. at once the authentication is successful in a very all the four factors, it activates the stepper motor, that implies the applications like ATM money dispenser, sensible Door Lock system and different security applications. Here, MATLAB is used as front end process and keil code runs at back end in ARM 7 Processor.

An Adoptive Approach for Design Strategies and Simulation of Wireless Adhoc Communication Network

Pravin P Ashtankar, Dr.Sanjay S.Dorle and Sonali N.Dhurvey

Abstract: In this paper we present an idea about the wireless adhoc network which is used in vehicle to vehicle Anti-Collision design system for determining collision course between two or more number of

vehicles. This system is giving an idea to generate node information that can be used for finding location awareness between the vehicles. Searching of other vehicles in the moving area is of primary importance to help the driver safely with negotiating speed, acceleration & deceleration. In these position the vehicle must acquire its own positional knowledge with respect to others and identify it's a possible collision. Here we used an active alarming system for detecting a possible collision between two or more numbers vehicles using GPS and IEEE802.15.4 MAC/PHY specification compatible system on chip. We design a mechanism or system for the safety coordinates of a vehicle based on its orientation i.e. distance, current speed, acceleration. This safety coordinates are used to get size of a vehicle thus detecting a possible collision. Firstly, we simulate a scenario up to nearly 10 vehicles in the area and test it practically achievable throughput using commercially available system on chip design.

IoT Enabled Security System for Android Users

Sulochana Roy

Abstract: Staying connected 24 X 7 with our near and dear ones and providing them with continuous added security services, especially when women and children step out of their houses to meet their daily needs, is one of the major challenges faced in today's society. In this project we aim to propose the design of an Internet of Things - based safety device using the Raspberry Pi 3 microcontroller, along with a pair of Android applications that would assist the primary user in notifying the required faculty instantaneously during any sort of emergency condition. Not only would this help the guardian to track the current location of the primary user i.e. their ward on receiving an emergency notification with the timestamp or allow the primary user to forward emergency calls to the nearest located emergency service provider, like ambulance, police, car workshops, cab services, which is mapped by the application of a clustering algorithm but also helps in capturing the allied emergency data like images or voice clips, storing the links to those in the Firebase cloud and then streaming it live over the Android application, once the guardian tries to read the notification forwarded to him/her by the primary user. These real time data being constantly stored in the Firebase storage, acts as a concrete source of reliable information, that can be of great help to the users in future for any sort of criminal or other investigations. Also the proposed system has been so designed that both the Android application and the IOT-based safety device can work independently of each other, with each one connected to the same or different Wifi networks, as per the availability, in order to minimize the chances of failure of this safety package when applied to real life scenario's.

Highly Nonlinear and Ultra High Birefringent Index Guiding Photonic Crystal Fiber: An Improved Design

Fahim Ahmed, Probir Kumar, Md. Abdul Hakim, Md. Nahid, Md. Sabuj Miah, Shovasis Kumar Biswas

Abstract: This paper proposed an improved Square Photonic Crystal Fiber (S-PCF) constructed with all circular air holes to achieve the highest birefringence and largest nonlinearity. By using Finite Element Method (FEM) with Perfectly Matched Layer (PML), the S-PCF has been studied and analyzed. Through simulation, the result show that birefringence is 2.914×10^{-2} , nonlinear coefficient is $113.5 \text{ w}^{-1} \text{ km}^{-1}$, and the negative dispersion is $-1137 \text{ ps}/(\text{nm.km})$ at 1550 nm wavelength. This S-PCF is designed with only circular holes of air which advantages us with easy fabrication process and the proposed SPCF is suitable for optical back propagation (OBP) scheme because of its high nonlinearity and large negative dispersion for the application of optical fiber transmission system.

Extremely High Nonlinearity and Large Negative Dispersion Compensating Photonic Crystal Fiber using All Circular Air Holes for Fiber Optic Transmission System

S. M. Rakibul Islam, Md. Rubayet Islam, Md. Tawhid Islam Opu, Mashfique Ahmed, Hafiz-Al-Wasif and Shovasis Kumar Biswas

Abstract: This paper proposes a hexagonal photonic crystal fiber (H-PCF) using all circular air holes for simultaneously attaining ultrahigh negative dispersion and ultrahigh nonlinearity. The proposed H-PCF design consists of an asymmetric core region, where one air hole has a reduced diameter and two air holes in the first ring has changed into four air holes. The full vector finite element methods (FEM) with circular perfectly matched boundary layer (PML) have been used for investigating the light guiding properties of the proposed HPCF structure. Simulation results informed that, it is not only possible to gain an ultrahigh negative dispersion coefficient of $-940 \text{ ps}/(\text{nm}\cdot\text{km})$ but also attain high nonlinear coefficient of $98 \text{ W}\cdot\text{km}^{-1}$ at the excitation wavelength of 1550 nm . The vital advantage of the proposed H-PCF design is that it furnishes the modal properties of PCF without using any noncircular air holes like elliptical or rectangular in the core and cladding region which makes the fabrication system more reliable and easier. However, in dispersion sensitive analysis, this proposed H-PCF design is highly robust as it attains ultrahigh negative dispersion which is very suitable candidate for optical back-propagation applications of optical fiber transmission link.

Identification of Most Suitable Zone for SVC in Power System Network

Mayuree Shegaonkar, Mrityunjay Gupta, Sourav Das and Parimal Acharjee

Abstract: The main aim of this paper is identification of most suitable zone for SVC placement. By comparing the bus voltage profiles at stressed condition the system is parted into weak and healthy zone. The SVC with the same compensation is placed in both weak and healthy zone separately. The user friendly Mi-power 9.1 software is used for real time simulation of arbitrarily loaded IEEE 57 bus test system with the inclusion of practical security constraints. The performance indices like voltage strength enhancement index(VSEI) and reduction of active, reactive power losses and relative environmental pollution deprivation index (REPDI) are used for comparing the performance of two zones. The test results are compared for all the cases and it reveals that the placement of SVC in weak zone is the most suitable considering all performance indices.

Post-processing Noise of ZF Detector with Varying Channel Condition

Amlan deep Borah and Joyatri Bora

Abstract: Spatial multiplexing increases the efficiency of a multiple input multiple output (MIMO) system by effectively using the available spectrum without the need of an additional power. Among the linear detector, ZF (zero forcing) is the most simple and effective, that regains multiple transmitted data at the receiver. Usually, in a service area, user may experience different channel type from highly scattered environment to less scattered one and hence the post processing noise will vary. Here, we present the mathematical derivation of post-processing SINR and hence the post-processing noise of ZF receiver with imperfect channel estimates for a seven cluster cellular network. We investigate the noise variation with channel condition at the output of MIMO ZF receiver when the channel varies

from Rayleigh to Nakagami-m fading for different 'm' values in the cellular service area. We find that post processing noise with Rayleigh channel is higher than with Nakagami-m as expected at the ZF receiver output for MIMO system.

Application of Grasshoppers Optimization Algorithm for Automatic Generation Control of Multi-area Power System

Barunesh Behera

Abstract: In this paper a novel manufactured shrewd pursuit strategy is introduced to discover the parameters improvement of Automatic Generation Control (AGC) in the view of Proportional Integral Derivative Controller (PID) for a power system. Here a two area non reheat thermal system has been taken with PID controller. The proposed system has PID controller which parameters is tuned by Grasshoppers Optimization Algorithm(GOA) and compared with the tuned controller parameters by Bacterial Foraging Optimization Algorithm (BFOA), Ziegler Nichols (ZN)/ conventional and Genetic Algorithm(GA). Then the effectiveness of the new proposed algorithm is analyzed in different conditions.

Silica Based Highly Nonlinear Dispersion Compensating Photonic Crystal Fiber

Tauhid Anwar, Sanjida Akter Mow, Eshrat Jahan Esha, Asma Islam, Abdullah Al Noman and Shovasis Kumar Biswas

Abstract: A single-mode highly nonlinear square photonic crystal fiber (PCF) is proposed and investigated using the fullvector finite-element method (FEM) simulation tool COMSOL Multiphysics. The simulation result shows that dispersion of -1405 ps/(nm.km), and birefringence of 1.74×10^{-2} , is obtained at excitation wavelength of 1550nm. The proposed square design also exhibits ultrahigh nonlinearity of 101.3 W $^{-1}$ km $^{-1}$ at $1.55\mu\text{m}$. By taking into account the fabrication issue, $\pm 2\%$ variation of diameter and pitch are also reported and discussed. Moreover, these modal properties are then compared against the results of some other contemporary PCF designs. The designed photonic crystal fiber can be used in optical back propagation process for compensating dispersion and nonlinearity.

Enhancement of Throughput for Cellular Data Network by Small Cell Deployment

Janmoni Borah, Md. Anwar Hussain and Joyatri Bora

Abstract: In the last few years, mostly in the urban areas, there is tremendous growth in the cellular traffic. Heterogeneity, high specification devices and increasing user density in the cellular networks have become major issues. Recent studies and researches are mainly relying on efficient modeling and analysis of such high demanding networks. This paper addresses the effect of deploying small cells (SCs) on an existing homogeneous and heterogeneously distributed macro cellular network. The effect on average user throughput for two scenarios are discussed - (i) when users are served by macro BS only and, (ii) when users are served by macro BS along with SCs deployed by applying k-means algorithm. For analysis of the distributions we consider the allocation of 1-resource block (RB) per user and 50-RB per user in the cell. A homogeneous Poisson Point Process (PPP) which generates entities in a uniform manner is used for modeling the homogeneous distribution. The spatial heterogeneity is obtained by adopting Cox process (also known as doubly stochastic poisson process,

DSPP) which allows uneven distribution of entities in space. The simulated results and plotted graphs depicts that, average user throughput gets increased gradually with deployment of 2, 4, 6, and 8-SCs in the macro cell.

Performance Analysis of Precoding Techniques in Cellular Network

Amlan deep Borah, Md. Anwar Hussain, Joyatri Bora

Abstract: In this paper, the performance of LTE codebook based precoding technique is analyzed in downlink cellular network. The performance in terms of sumrate is compared with ZF, MMSE, SVD based and GMD based precoding techniques. Rich scattered Rayleigh fading channel is considered. For scheduling users, random user selection and semi-orthogonal user selection (SUS) techniques are employed and antenna selection is done with two antenna selection techniques-(i) considering maximum channel gain and (ii) maximum sumrate of antenna combination among all possible antenna combinations of BS antennas. We consider the LTE codebook for 2 transmit antennas and 4 transmit antennas case. Accordingly, 2x2 and 4x4 MIMO configuration is considered for performance analysis.

A Comprehensive Review of Mobile Crowdsensing

Kuldeep Jha and Niranjana Ray

Abstract: Mobile Crowdsensing is the crucial building block for many Internet of Things(IoT) applications. Its demand is increasing day by day. Smart devices such as smart phones or smart watches are equipped with varieties of sensors which are used to collect information. By using different sensing ability of smart devices and client portability, different services can be provided. In this article, we provide an overview on Mobile Crowdsensing. In spite of these, we have also focused on different mobile applications, existing architectures and challenges associated with Mobile Crowdsensing.

Development of Advanced ATM Surveillance and Security System

Avinash Deshpande, Balwant K. Patil, Sateesh N. Dodamani and Rudresh B. Magadum

Abstract: ATM systems offer great convenience to the public for withdrawal of money from their bank accounts and provides pleasant advantage on losing their time in the bank for many hours. At the same time, there are many ATM robberies that have been reported in India, even when the CCTV cameras are placed in the ATM centres. Hence, it is important to employ an automatic surveillance system to protect and secure the ATM machine from such threats. In this paper, an automatic surveillance and control system for ATM is proposed which can monitor the ATM system for any attack either on ATM machine or on user while doing transaction in ATM centre and prevent it and trap the burglar. This system will enhance the security level of ATM centres. A prototype of this system with necessary hardware is developed to demonstrate the effectiveness of this system in real time ATM centres.

Synchronous Electric Machines with Tooth-coil Winding and Magnetic Flow Barrier

Flur R. Ismagilov, Viacheslav E. Vavilov and Denis V. Gusakov

Abstract: In this paper the solutions for minimizing eddy current losses in permanent magnets and pulsations of the electromagnetic moment in synchronous electric machines with permanent magnets and fractional tooth-coil winding are considered. Several structural designs of these machines with

different locations of the magnetic flux barrier in the magnetic core are considered. The studies of the presented designs are carried out by computer simulation methods in the software complex Ansys Maxwell. The research tasks include dynamic analysis of electromagnetic moments and their pulsations, eddy current losses in permanent magnets and distribution of magnetic flux density in the considered design schemes. Based on these criteria, the most effective location of the magnetic barrier is determined. Simulation is carried out both for the motor operating mode and for the generator mode. In addition, the characteristics of the synchronous electric machines with permanent magnets with a fractional tooth-coil winding are also investigated when a magnetic barrier and a ferromagnetic wedge are used simultaneously. A controlled magnetic barrier is proposed to use for minimizing the higher subharmonics without degrading the energy characteristics.

A survey and Analysis of Techniques to Diagnose COPD

Ms.Shaila H Koppad, Dr. S Anupama Kumar and Dr. K.N. Mohan Rao

Abstract: Increase in population worldwide has increased the growth of diseases and its complications across the world. The common diseases which occur among people may be preventable in the initial stages only and treatable in all the stages. One among such preventable lung disorder disease is Chronic Obstructive Pulmonary Disease (COPD). This paper gives an insight on the health care issues related to COPD and how researchers handle the issues using various technologies. This paper discusses the research works carried over in recent years regarding the growth of the disease, the findings of the researchers in understanding the challenges in predicting the disease and handling the patients using statistical and computational tools. This paper contributes a comparative analysis on the various statistical and computational techniques used by researchers across the world to identify and anticipate the commonness of the infection for COPD disease. A proposed methodology which can be adopted to identify the various attributes and foresee the normality of the disease is convened.

Hand Written Indian Numeral Character Recognition using Deep Learning Approaches

Sivaanandh M, S.Surya and G.Priyanka

Abstract: Hand written Character recognition is evolving topic as the size and shape of the hand written characters could not be uniquely characterized. The proposed work considers the numeral characters in the image form in varieties of orientation and shape for the digits. The features are extracted and subjected to NaïveBayes classifier, BayesNet classifier and the results associated with the metrics are worked out. Recently, the deployment of machine learning techniques is widespread and has proven improved performance. In the proposed work we have deployed the deep learning network with one stage of convolution layer with 20 numbers of 5x5 filters, Rectifier Linear Unit, Max pooling layer, fully connected softmax layer. The MNIST dataset with 60000 number of training images and 10000 numbers of testing images are used to experiment the proposed network. The results observed using the deep learning techniques are superior to the existing classifier such as NaïveBayes and BayesNet classifier and also the recent work proposed using deep learning techniques with 3x3 filers in the convolution layer.

Design of Fuzzy PI Controller Optimized with Crow Search Algorithm of an Interconnected AGC

Aditya Kumar Nanda and Dr.Ramesh Chandra Prusty

Abstract: For proper reliability of an interconnected power system, there is a necessity of load frequency control (LFC). Load frequency control regulates the output power of the generator with

respect to change in the system frequency and tie-line power. LFC does so by taking consideration of flow of tie line power and system frequency variation in a prescribed limit. The controller used in this paper is a Fuzzy Logic Controller (FLC), whose parameters are optimized using Crow Search Algorithm (CSA) for the proposed system. The parameters are compared with the help ITAE which is also taken as the objective function. The result of the proposed controller is compared to that of with other fuzzy control techniques such as Particle search and hybrid PPSO [1], and it is found that the intelligent controller performs better as compared to other techniques. Finally robustness of the controller is determined with various loading conditions. For carrying out the above objective a two area non reheat system is taken into consideration.

Transient Response of DFIG Fractional Order Model Connected in Standalone Mode

A.Ravi Shankar and Dr.T.R.Jyothsna

Abstract: Doubly fed induction generator when subjected to load variation experiences fluctuations in stator and rotor currents in magnitude and frequency. In this paper mathematical d-q model of DFIG is expressed in state space model and fractional order state space model. Variations in state variables for load change has been done using MATLAB software and FOMCON toolbox, results has been compared.

Ultrahigh Birefringence Hexagonal Photonic Crystal Fiber with High Nonlinearity using All Circular Air Holes

Nuzhat Nawshin, Khan Farhan Ibne Faruque, Md. Abdul Hakim, Md. Sabuj Miah, Mehedi Hasan Khan and Shovasis Kumar Biswas

Abstract: We proposed a simple design of hexagonal photonic crystal fiber (PCF) using all circular air holes due to its achievement in ultra-high birefringence value and large nonlinearity simultaneously. For analysis and inspection, the guiding properties of PCF, Finite Element Method (FEM) with perfectly matched layer is used. Simulation results confirms that the proposed PCF structure offers an ultrahigh birefringence value of 0.03029, negative dispersion coefficient of $-494.8 \text{ ps.nm}^{-1} \cdot \text{km}^{-1}$ and a nonlinear coefficient of $78.29 \text{ W}^{-1} \cdot \text{km}^{-1}$ at excitation wavelength of 1550nm. The major advantage of this proposed structure is fabrication flexibility due to the use of only circular air holes rather than elliptical air holes. In addition, the proposed structure makes itself suitable for sensing, dispersion compensation and super continuum generation.

Harmonic Mitigation in Three Phase Three Wire System using Shunt Active Power Filter

Rajeev Lakra, Idamakanti Kasireddy and Arun Kumar Singh

Abstract: This paper deals with the performance of shunt active power filter in a three phase three wire system. The control strategy is based on Instantaneous power theory and the performances are analyzed with different loads to see its effectiveness with the changing loads. The analysis is done in MATLAB/Simulink environment and the capabilities of the shunt active power filter like harmonic mitigation and load balancing applications are verified with the results obtained.

A Survey on Recent Approaches for Big Data Analysis

Pravin S Game, Dr. Vinod Vaze and Dr. Emmanuel M.

Abstract: Lot of research is being carried out on big data the data considered to be too large to be processed using traditional infrastructure, technology and methodologies. Machine learning algorithms have been used for analyzing this big data and are being modified for various applications. This work is an effort towards presenting the recent developments in big data analysis. The paper also discusses few recent case studies using big data analysis in applications.

Smith Predictor Implementation of a High Dead Time Interacting Tank Process

Dr. S. Meenatchi Sundaram and Dr. P. R. Venkateswaran

Abstract: Model based control algorithms are implemented when traditional control algorithms are inappropriate and fails to produce effective results. Smith predictor is an effective control structure to control process with high dead time. In this work, real time Smith Predictor algorithm is implemented to control a high dead time interacting tank process using LabVIEW. It requires a good knowledge about the process to extract the mathematical model. The model requires to capture the entire dynamics of the process so as to make the control algorithm more effective. In this work, open loop analysis is carried out to understand the dynamics of the plant and the model is extracted using empirical method. A first order plus dead time model (FOPDT) is considered and Smith Predictor structure is implemented to control the process. It is observed that the traditional PID control produces a sustained oscillation because of high dead time and Smith Predictor based control for the same PID parameters produces an effective control of the process.

Improving Voltage Profile of Renewable Energy Sources using Multiple Energy Storage Systems

Avinash Deshpande and Mrityunjaya Kappali

Abstract: Intermittency is the major concern associated with Renewable Energy Sources (RES). These sources alone cannot meet load voltage and power requirements, hence they are used in conjunction with storage systems. However storage system design proves more effective when multiple storage systems like battery and super capacitors with different capacities are included. Battery serves as main back up where as supercapacitor serves as secondary back up to improve voltage profile. Super capacitor relieves the over stress on the converter and avoids unnecessary switching on/off of battery in response to transient voltage fluctuations. The main objective of this paper is to propose a control scheme which can switch either super capacitor or battery, depending upon the severity of voltage fluctuation so as to improve overall voltage profile. This helpssystem to operate at maximum efficiency, reduced converter losses and importantly increased storage life time

Brain Tumor Detection and Segmentation from FLAIR, T1C and T2 Weighted MR Images

Sanjay Saxena

Abstract: The process of detection and segmentation of infected tumor area from brain MRI (Magnetic Resonance Imaging) is an area of primary concern, a time-consuming and tedious task is performed by the clinical experts or radiologists. The accuracy of their diagnosis depends on their experience and skill only. So as to subdue these limitations, the need of CAT i.e. Computer-aided technology arises. In this work, distinct MRI sequence images including T2 weighted, T1C weighted

and fluid-attenuated inversion recovery (FLAIR) weighted MRI is considered into account for detection and localization of brain tumors. To make the process of brain tumor detection and segmentation automated, various classification and segmentation techniques are applied and studied. For the classification first order statistical features, GLCM (Gray level co-occurrence matrix), GLRLM (Grey level run length matrix), LBP (Local Binary Pattern), HOG (Histogram of Gradients), CDTM (Cross Diagonal Texture Matrix), and Simplified Texture Spectrum Features are considered. Further, a comparative study with different classification techniques is also presented and to localize the exact tumor in T1, T2 and FLAIR type images segmentation using fuzzy c means clustering is also implemented with significant results in terms of dice similarity coefficients.

Comparison of Body Temperature and Heartbeat between Male and Female using Arduino

Manjulata Sahu, Mithilesh Atulkar and Mitul Kumar Ahirwal

Abstract: In human health condition monitoring, measurement of heart rate and body temperature plays very crucial role in medical diagnosis. Traditionally electrocardiogram (ECG) is used for heart rate measurement (HRM) and mercury-based thermometer and thermostats are used for body temperature measurement (BTM). The traditional methods of heart rate and body temperature measurement are costly, time-consuming, uneconomical and less efficient. In this paper, a compact and low-cost digital heart rate and body temperature measurement device have been discussed. In the proposed work LM 35 temperature sensor, digital pulse rate sensor and ATmega 328P microcontroller based Arduino UNO board is used. The proposed device is primarily tested for measurement of heart rate and body temperature of five female and five male under different condition. The measured data are further analyzed to establish the correlation between heart rate and body temperature of male and female under different condition. Also, the measured results are stored, visualized and studied for health conditioning and monitoring purpose.

New Principles of Algorithm of Current Protection based on Three Instantaneous-value Samples

Nadezhda Buryanina Yuriy Korolyuk, Elena Lesnykh and Konstantin Suslov

Abstract: Modern switches disable short circuits for two to three periods of frequency, so the requirements for algorithms implementing emergency control are very strict. Therefore, the development of algorithms capable allocate sinusoidal component during a half period and less relevant. The paper proposes equations for finding the current parametric values and their derivatives based on three samples. These equations reduce the effect of non-periodic components on how accurately their periodic counterparts are isolated from the current samples received by digital power-system protection devices. No calculation errors occur when parameters are sinusoidal. We have developed an algorithm to correct current data when the current transformers have their magnetic cores saturated.

Comparative Analysis between Conventional PID and Fuzzy Logic Controller for UPQC in DFIG based WECS Integrated to Grid

M. Rama Sekhar Reddy and Dr.M.Vijaya Kumar

Abstract: The problem in providing stable power in WECS is considered to be a major concern. Voltage instability mainly occurs due to the inter connection of wind power to the grid. Due to voltage instability power quality issues such as sag, swell, harmonics, flicker, etc will occur. In order to

overcome these issues various FACTS devices are used. Out of these devices UPQC is found to be more reliable and it can provide control over both the voltage variations and as well as the current harmonics. The efficient control technique that can be used in UPQC, that makes it possible to reduce the voltage fluctuations like sag and swell conditions, as well as current and voltage harmonics mitigation in wind energy conversion system. This paper deals with the comparative analysis between conventional PID and Fuzzy Logic controllers design for unified power quality conditioner in wind energy conversion system for reducing the power quality issues. The model is developed on MATLAB/ SIMULINK platform and results are presented.

Lung Cancer Detection using CT Scan with Artificial Neural Network

Loveneet Kaur, Manmohan Sharma, Rajan Dharwal and Aditya Bakshi

Abstract: Lung cancer is one of the most common disease in India. Reason behind this disease is unawareness among people and symptoms of disease are only recognized in their posterior stages. In this study, a lung cancer detection technique using Artificial Neural Networks has been investigated. Followed by image enhancement techniques, ANN has been used for classification of lung cancer stages. Lung cancer CT images have been taken from a private hospital. Accuracy of 93.3% has been achieved which is efficient enough as compared to existing systems. In Future, Ant colony optimization can be used with ANN for better results.

Computational and Statistical Analysis of Heart Disease Prediction

Heena Farheen Ansari and Dr. Varsha Namdeo

Abstract: This papers explores the current trends in the direction of heart disease prediction from different dataset. It includes the methodological survey and discussion based on the current trends and the previous literature. It focuses on the dataset used and methodological achievements. It also includes the current death rates along with the comparative study from the previous trends to show the horrible statics worldwide. The statics have been considered from world health organization (WHO).

Analysis of the Cloud Computing Architecture for the Better Security

Dr.K.SAI MANOJ, K. MRUDULA, Mrs. G.Maanasa and K.Phani Srinivas

Abstract: The existing cloud computing architectures differs in many ways. Security has been the serious issue as client related data and processing is undertaken using the infrastructure provided by third party service providers varies greatly. It is necessary to know the extent of inclusion of security into the cloud computing system and then find the best architecture that includes best and tight security system. In this research paper, a comparison of existing architectures from the perspective of inclusion of security infrastructure within cloud computing system is presented along with a comprehensive architecture that is included with every aspect of security taking into account the most of the vulnerabilities.

Design and Analysis of Low Power, High Speed 4 - bit Magnitude Comparator

Pranay Singh and Pramod Kumar Jain

Abstract: This paper illustrates the design of low power, high speed 4 Bit Magnitude Comparator. The NOR gate logic used in this paper to design the proposed circuit can help in designing of low power, high-speed larger N-bit magnitude comparators. The performance is analyzed for the proposed comparator design for power consumption, delay & Power-delay Product (PDP) with V_{dd} Sweep. The design and simulation are done on Cadence Virtuoso Tool Using 180nm CMOS Technology. The simulation results of proposed comparator circuit are in good agreement in terms of power consumption at the percentage of 31.77% and power delay product at the percentage of 35.39%. The Layout is also designed for Proposed Comparator. The proposed circuit is using less number of MOSFETs as compared to Basic Conventional Circuit. This will further reduce the area of the chip, which is currently the most important task in the VLSI industry.

Pin Fins Heat Sink Geometries for Electronic Packaging using Forced Convection

V Manoj Kumar and B Nageswara Rao

Abstract: The fore most purpose of a heat removal component is to maintain the temperature of the device below the maximum possible temperature. As a part of next generation device, the CPU assembled with ideal heat removal mechanisms. In order to exhibit the greater versatility in electronic package industries, one must come up with innovative geometrical design heat sinks. Currently circular pin fin results are validated with the previously published results. We have taken up a variety of designs in both inline and staggered manner to enhance the rate of heat dissipation. Also the CFD analysis has been carried out for different geometries at different velocities of pin fins heat sink. For a set of velocities of 2, 4, 6, 8 & 10 m/s, the total heat transfer rate for improvement of taper staggered geometries are 138.94, 135.65, 133.71, 111.22, & 96.78 percentage respectively. It was found that the rate of heat transfer of taper staggered geometry was highest among other types. The taper geometry in pin fin heat sink analysis is kick-start of electronic packaging industry to see the efficacious result in the practical field applications.

DSP-based Power Quality Events Detection and Classification using Hilbert-Huan Transform and Random Forest Technique

Mrutyunjaya Sahani, Arpita Mishra, Nishant Patra and G Bharat Gourav

Abstract: In this paper, Hilbert Huang transform (HHT) and random forest (RF) strategy are isolated to recognize and power quality events (PQEs) continuously situation. Empirical mode decomposition (EMD) is used to separate the non-stationary power quality events (PQEs) into the mono-segment method of movements, known as intrinsic mode functions (IMF). Hilbert transform is used to remove the sensible features of the monosegments natural mode capacities (IMFs). The four highlights which are removed from Hilbert exhibit are standard deviation of size, Hilbert energy, Tsallis entropy and standard deviation of stage to set up the random woods (RF) classifiers. Random forest strategy is a classifier which is used for settling on decision tree and it has an intriguing capacity to bargain well with uneven informational indexes having missing factors and snappier preparing time contrasted and other machine learning techniques. Moreover, the proposed Hilbert Huang transform (HHT) and random backwoods (RF) procedure are executed. HHT-RF methodology are executed in the

equipment display was executed using digital signal processor (DSP) to support the likelihood of the system in the continuous situation.

Modeling and Simulation of Multijunction Solar or Sun based Cell

Sudhir Kumar Tripathi, Stuti Chakraborty, Dr k. Namrata and Prof.Arun Kumar Singh

Abstract: This paper manages with the modelling of quadruple junction solar cell (qjsc) constructed by using the semiconductor material of AlGaInP-GaAs-GaInAs-Ge at a particular value solar irradiance, temperature. Comparison of output I-V and P-V curve of the quadruple junction solar cell is done with triple junction cell made of semiconductor material InGaP-InGaAs-Ge and single junction solar cell (sjsc) made of a Ge semiconductor by using MATLAB/SIMULINK. It has been found a higher value of output voltage and power in quadruple junction solar cell as compared to single or triple junction solar cell. The above described quadruple junction solar cell is made by using the material having a same lattice structure which helps to ease the flow of current in all the four junctions and analysis is done at solar irradiance (1000-800-500) w/cm². The whole analysis is done through pessimistic approach on the basis of the single exponential

CNN for Butterfly Classification

Debani Prasad Mishra, Tanmay Kumar Tripathy and Stuti Chakraborty

Abstract: In the world of widely available mobile phones and tablets, electronic field guides for the identification of different biodiversity components are emerging as a reality. This project aims to classify butterfly images based on their species using a convolutional neural network in TensorFlow. The goal is to get an accuracy of 80% or above on a butterfly data set. The result of this project includes a testing accuracy of 0.47 by a model that was trained for only 18 hours, i.e. partially trained. Another additional goal is to show that a neural network once trained can be used to identify the species of the butterfly in rather short time, which will make identification and tracking of different butterfly species much easier and efficient.

IoT for Healthcare

Debani Prasad Mishra, Tanmay Kumar Tripathy and Stuti Chakraborty

Abstract: The Internet of things uses gadgets to form a collective network of smart devices for automation. The IoT has a lot of application in many fields such as security, industry, as well as health care. The IoT revolution is redesigning modern health care with very economical, technological aspects. In this paper we focus on the importance of iot application in medical care sector. The structure of the health care system and the ever growing applications on health care gives us lot of promise for growth, the applications for users and services they are provided with are explained in detail. The paper proposes a few facilities for societies on a whole and it discusses the aspects of research areas that need to be developed.

Voltage Regulation of PV Cell using PID Controller

Debani Prasad Mishra, Stuti Chakraborty and Tanmay Kumar Tripathy

Abstract: This paper introduces the reproduction of managed DC voltage sources. The DC source primary supply is a sun based PV demonstrate which creates a flimsy yield voltage. The model is done

with the end goal that the info parameters are the light and the temperature and the yield is the unsteady voltage. The yield current is an imperative parameter to accomplish exact yield voltage, that current is estimated and encouraged to the contribution of the model to be utilized for condition assessment. Voltage direction i.e regulation is expected to make the created voltage usable. A straightforward buck converter with PID controller used to manage the yield voltage. SIMULINK is utilized to mimic the general framework. Reenactment result is given to confirm the operation of the model. The experimental and simulation results demonstrate the effectiveness of the presented analysis, design, and implementation.

PI and Predictive Torque Control Techniques for Controlling Power and Torque Generated from Wind Turbine based on DFIG

Asit Kumar Panda and Dr. Chandrabhanu Mishra

Abstract: In this paper, a predictive torque control (PTC) method is introduced at grid side converter (GSC) and PI controller is used at rotor side converter (RSC) of Doubly Fed Induction Generator (DFIG) based wind turbine. The concept is widely used in multi-phase electric drives. There are two parameters usually challenging for the power rating of a wind energy conversion system (WECS): improper control strategy for RSC, which is the primary reason behind current harmonics and for GSC, it is the reason behind voltage harmonics. In several wind turbine systems while maintaining these harmonics leads to improper electromagnetic torque. This two fold effect of controller is worst while using same controller for both GSC and RSC. While in several research works it has been seen different controllers for both side, resulting improved results. In our proposed work a predictive methodology has been adopted which predicts torque and stator current to be used as reference signal in controlling GSC and a well-tuned PI controller for RSC. The results obtained shows significant reduction in harmonics at rotor side and grid side.

Analytical Study of SEP & M-SEP in Wireless Sensor Network with Heterogeneous Platform

Debabrata Singh, Shrabanee Swagatika, Nibedita Jagdev, Mitrabinda Khuntia, Rahul Kumar Ankit and Arup Kumar Mohanty

Abstract: Wireless sensor networks (WSN) are growing in every aspects ranging from measuring temperature, humidity, rainfall to the battle field. In this type of application there are large numbers of sensors that has not been used and some are work independently. This paper put forward an analytical study of Stable Election Protocol and Modified Stable Election Protocol for heterogeneous wireless sensor networks (WSNs). The purpose of this comparative study is to analyze and identify the suitable platform for more stable and energy efficient heterogeneous WSNs platform. The study is supported by multiple simulations in a random distribution environment with different parameters like number of dead nodes, alive nodes, amount of data transmitted to the destination etc. from the simulation and result analysis we can say M-SEP is more stable and effective than SEP as well as M-SEP provides a longer stability period on an average of 9% extra than SEP.

Internet of Things based Low-cost Weather Data-logger and Automatic Alert System

Murchhana Islam and Sayantani Datta

Abstract: The weather affects a wide range of activities, from farming and agriculture to everyday transportation. Integrated weather forecasting and meteorology play vital roles in our daily lives. To

predict weather and climate, real-time weather data has to be collected and studied upon. This paper presents the design and implementation of an Internet of Things based weather monitoring and alert system. The system uses sensors for temperature, pressure, humidity, raindrop detection, etc. to monitor the inputs that are essential to the user's operations. The real-time weather data is logged at user-defined intervals to an open source IoT application and API, ThingSpeak, via an open source ESP8266 based IoT platform, NodeMCU, and software Arduino IDE. Using MATLAB analysis and visualization, trends in the data are tracked over time on the cloud. The system also sends the user an alert in the form of a Tweet whenever a certain sensor parameter crosses a threshold limit.

Loss Allocation Schemes in Power Distribution Networks-A Bibliographic Review

Sivkumar Mishra and Ambika Prasad Hota

Abstract: In this paper, an up to date bibliographic survey of the various loss allocation methods applied to power distribution systems is presented. The loss allocation methods for distribution systems with distributed generations are also included.

Assessment of Power Quality Events by EMD based HILBERT Transform and S-Transform using Different Classifiers

Sushil Kumar Jena, Papiya Ray and Manish Kumar Babu

Abstract: The use of electronics and Flexible AC transmission devices in the power system solved a lot of problems with flexibility and improved power transmission capability. In the same time it also raised various power quality problems to the system. Hence it is of essence to analyse the power quality problems and classify them in order to take necessary steps to eradicate those problem and improve the power quality. The method proposed for power quality problem is analysed by Empirical Mode Decomposition. Then Hilbert Transform is applied on the intrinsic mode functions. Thereby the characters can be extracted from the IMF-H transform of the signal which is classified by the proposed neural network and the classifiers. Here probabilistic neural network, Support vector machine and Fuzzy Classifier are used for the classification purpose. Similarly the Stockwell Transform of the signal is found out and various features can be extracted from the signal. The extracted features are used for classification using the above mentioned classifiers.

Privacy Preservation and Security Dilemma Relationship Proposition for IoT Authentication

Attlee M. Gamundani, Amelia Phillips and Hippolyte N. Muying

Abstract: Internet of Things (IoT) authentication demands a complex approach to ensure all facets of security are taken care of. Security in IoT is not complete without looking at privacy protection especially if sensitive data is involved. Privacy of user credentials is critically important as that holds pieces of data that can compromise the whole security system. The need to emphasize on privacy preserving for authentication is on the basis that, we need to complete the security puzzle unequivocally. One of the security worries in IoT is user data privacy as a result of the unsupervised nature of IoT device's interaction. Focusing on smart home environments and personal area networks to a large extent, this paper gives an overview on some of the existing solutions that employs privacy

preserving attributes towards providing IoT authentication security solutions in the quest to try and provide the relationship between privacy and security.

Application of Empirical Mode Decomposition and Support Vector Machine based Algorithm for the Classification of Arc Fault in Distribution Line

Himadri Lala and Subrata Karmakar

Abstract: This paper presents an empirical mode decomposition (EMD) and support vector machine (SVM) based approach to classify different types of arcs due to the interaction of a medium voltage distribution line and different surfaces. Different type of arcing surfaces i.e. concrete, wetsand, grass and leaning tree, are considered in real-time environment in order to create different arcs. The similarity found in different arcing events is the low (in mA) current flowing during arc. The voltage signals are taken as the basis of the whole analysis. The results obtained by the application of EMD along with different support vector machine techniques on voltage signals successfully classifies different high impedance arc faults (HIAFs) for different arcing surfaces on the basis of their harmonic footprints.

Effect of Gate Engineering and Misalignment on the RF Performance of DG HFET

Samparna Parida and Monalisha Mishra

Abstract: In the current era of MOS Technology, DGMOS HFETs (Double Gate Metal Oxide Semiconductor Heterostructure Field Effect Transistors) are one of the front runners in high speed switching applications. This paper presents the implementation of DGMOS HFET and effect of gate metal misalignment on the device parameters. An extensive simulation based study have been analysed on the back gate of the DGMOS HFET models by taking Drain Side Misalignment (DSM) and Source Side Misalignment (SSM). Various RF parameters and figure-of-merits of the misaligned structures of gate engineered DGMOS HFETs have been found out from the 2D simulation using commercial Sentaurus TCAD tool. These models are Single Material Double Gate (SMDG), Double Material Double Gate (DMDG), Triple Material Double Gate (TMDG) structure.

Product Usability and Capability Evaluation using Modified BAT-ARM Algorithm to Alleviate Feature Fatigue

Divya and Midhunchakkaravarthy

Abstract: The growth of online shopping in recent years have become most common factor for buying the products. As most customers prefers the products with more features for better usage, there are more chances of making customers unhappy due to unwanted features. This uncertain impact on the product from the customers is termed as Feature Fatigue. To avoid this a proper mechanism must be constructed to remove such dissatisfaction to alleviate Feature Fatigue (FF) of a product. In this paper an Improved BAT – Association Rule Mining (IB-ARM) algorithm is proposed for generating optimal rules to evaluate product usability and capability for alleviating FF. In IB-ARM algorithm Elitism operator is applied to propagate BAT optimal solution set. Finally, a Hybrid Ant Colony optimization and Artificial Bee Colony (ACO-ABC) algorithm is applied for Feature Fatigue analysis.

Microstrip Patch Antenna Design using Fractal Slot Geometries for Multiband & Wideband Applications

Manas Ranjan Jena, Guru Prasad Mishra and B.B.Mangaraj

Abstract: In this article, we have presented a design of Microstrip Patch Antenna (MPA) using hybrid fractal slot (Koch- Koch) for wideband applications. In modern era, the different variety of antennas are available that can be used in the field of communication but some systems require ultra wideband and multiband antennas like commercial and military telecommunication system. Microstrip antennas have limitation of narrow bandwidth. Fractal geometries have marvelous kind of distinct properties from other antennas. For achieving the desired miniaturization and multiband properties, different shapes of fractals are used. Fractal slots can be made in microstrip patch so that its limitations can be evicted. In this paper, we studied about the different fractal slot geometries that enhance its use for different kinds of applications.

Remote Monitoring of Atmospheric Pollution

Augustyn Chwaleba and Piotr Majdak

Abstract: Satellite monitoring systems can be used for remote monitoring of the atmosphere over a given area but they do not provide information on the state of pollution at a given time. Additional information could only be obtained after several days. Measurements from an aircraft may be obtained almost at real-time and in different geometries – vertical and horizontal. The future of this type of monitoring are remote-controlled unmanned aerial vehicles (airplanes, helicopters and balloons tethered), equipped with telemetric monitoring.

An ASIC Implementation of Successive Cancellation Decoder with Built-In Scan Chain

Lakshmi Manasa Sistla and LakshmiNarayanan G

Abstract: polar codes have created an immense impact in the field of channel coding. Polar codes are mathematically simple with a recursive structure and low complexity, proven to achieve channel capacity for long block lengths. This paper presents a built-in scan chain based Successive Cancellation (SC) Decoder design for polar codes implemented on an ASIC. The addition of mux's for scan chain based testability of 32-bit SC decoder leads to a small cell count and area overhead of nearly 8.9% and 10.7% respectively. The implemented chip of the proposed design is operating at 100MHz for an LLR represented using 5-bit two's complement form.

Application of Flower Pollination Optimization for MPPT Controller of a Standalone Photovoltaic System

Jugajyoti Sahu and Niranjan Nayak

Abstract: The fast growth of industrial load and scarcity of fossil fuels encouraged the renewable power application during last few decades. The renewable sources like wind farms, fuel cell, PV generation etc. replaces some of the conventional power source. Nevertheless among all the renewable energy sources the use of photovoltaic cell plays a vital role in power system, due to easy availability, low cost etc. The main drawback of for PV cell includes irregular environmental conditions and

variable irradiance and temperature. Hence in this work we explained about the proper control of MPPT controller by adjusting the duty cycle of the inverter for the nonlinearity of PV cell. In PV system the response is dependent on PI controller. However the heat and trial method of selection of controller gains affects the system output. Thus to obtain proper value of PI controller gain and to get an improved the generation capacity of PV system, a new optimization technique i.e, flower pollination optimization technique is applied. Here a PV model with incremental conductance MPPT technology is simulated in MATLAB/SIMULINK environment. It is depicted from the results that, the FPO-PI-MPPT shows better performance than the conventional PI controller.

A Region based Optimal Multifocus Image Fusion Scheme

Bikash Meher, S. Agrawal and Pranaba K. Mishro

Abstract: In the region based image fusion methods, the source images are partitioned into distinct regions using various segmentation techniques. The segmented regions are fused using different fusion approaches. This paper presents a region based multifocus image fusion scheme employing fuzzy c-means (FCM) clustering and optimal independent component bases. The bases are optimized using modified particle swarm optimization (MPSO). The different regions in the input images are obtained using FCM. The optimal bases are used to fuse the regions in the independent component analysis (ICA) based transform domain. The results found using the suggested method is compared with two other techniques. The simulation results reveal that the suggested procedure is better as compared to the other two techniques.

Genetic Algorithm based Comparative Study of Stability Gain in Wind Energy Conversion System

Manjushree Diptimayee Patra, Bibhu Prasad Ganthia, Laxmipriya Biswal and Sanjib Kumar Majhi

Abstract: Near future wind energy is plays vital role in production of electrical energy as renewable source. In this paper DFIG i.e. Doubly Fed Induction Generator is used which is effective towards variable speed and pitch angle control scheme useful in industries. The machine run under grid connected as well as standalone mode. These control schemes include the generator-side converter control, the grid-side converter control, the pitch angle control and the maximum power. Simulation done using MATLAB and the Genetic Algorithm optimization technique adapted with comparison to various conventional techniques. The optimized technique using GA based on fitness function which is shows qualitative control than other techniques. Here in this paper coding based simulative results are compared with GA and conclude that the GA is effective in control and operation in DFIG based wind energy system.

Performance Comparison of BPSK, QPSK and 16-QAM Modulation Schemes in OFDM System using Reed-Solomon Codes

Simarjeet Kaur, Navdeep Singh, Gagandeep Kaur and Jasbir Singh

Abstract: This paper present the performance comparison of the different modulation schemes in orthogonal frequencydivision multiplexing (OFDM) communication system using Reed-Solomon (RS) codes in term of BER (bit error rate). The comparison analysis is done in OFDM system on the effects of three different modulation schemes BPSK, QPSK and 16-QAM being used. The OFDM system

with RS encoder is used as a reference for MATLAB simulation, implementation and analysis. It is shown that from among the modulation schemes studied, the OFDM system with RS encoder using BPSK modulation perform better BER probability under all SNR (signal to noise ratio) conditions as compared QPSK and 16-QAM OFDM systems.

An Optimized Robust FOPID Controller for Stability in Unstable System

Deep Mukherjee, Palash Kumar Kundu and Apurba Ghosh

Abstract: This article shows a challenging way to use PID controller with both integer order and fractional order for an inverted pendulum system. Here, researcher's work aims to show stability performance of inverted pendulum system using both conventional and fractional order PID controller with fminunc mathematical process as local optimization algorithm minimizing ITSE as a scaler objective function. After obtaining optimized parameters for both of the controllers PID and FOPID a comparative study has been performed to show the most acceptable nature of the inverted pendulum with respect to performance indices as rise time, overshoot, settling time, ISE, IAE, ITSE, ITAE. Next robustness performance of inverted pendulum has been studied using both of IOPID and FOPID Controller.

Protection Scheme based on Fault Detection and Fault Classification using Fuzzy Inference System in IEEE-9 Bus System

Aditya Patel, M.V.S. Prashant, Jharna Sahu and Ancy Prerena Kujur

Abstract: In any electrical power network the continuity of power flow with high level of reliability is necessary. It is necessary to detect and classify the fault in any power system network. This paper Proposed the Protection Scheme in IEEE-9 bus system based on Fault Detection and Classification using Fuzzy Inference System. In this Scheme the Magnitude of Positive Sequence Voltage, Positive Sequence Current, Zero Sequence Voltage and Zero Sequence Current signals are used. This feature of IEEE-9 bus system is obtained using Discrete Fourier Transform. The 3-Phase Positive Sequence Voltage, Positive Sequence Current, Zero Sequence Voltage and Zero Sequence Current signals are collected at one end of a transmission line in a bus thus the communication link which is used to collect remote end data dependability is removed. In this scheme four fuzzy FIS modules are developed to detect the presence of fault in any of the 3-Phase and to identify the presence of Ground. Fault Simulation is done in MATLAB/Simulink for all possible Symmetrical and Unsymmetrical fault combinations by varying Fault Location, Fault Resistance, Fault Inception Angle, Load Angle, Load Magnitude, Generator Supply and Generator Supply Frequency. The Results shows that proposed scheme is able to perform the Tripping action and Classify the Fault therefore the scheme can be employed in practical application.

Automation of Image Classification to Identify Malaria

Alan Shona Saldanha, Ankitha B, Raju K and Ranjan Kumar H S

Abstract: Malaria is a very serious contagious disease affecting human and other animals caused by the plasmodium parasites. Malaria is spread by female Anopheles mosquitoes. The parasites enter into the human circulatory system when the infected female Anopheles mosquito bites human. Traditional

method of malaria detection that is using microscope is the gold standard. But this method is time consuming and inefficient and results are inaccurate. Hence an automated method based on image classification that can identify malaria parasites present in the blood smear images is developed. This is useful where the expert in microscopic analysis is not available. Thin blood smear images are acquired, preprocessed, relevant features are extracted from them and is further segmented to make the processing faster and finally morphological operations based on shapes and sizes is carried out. Experimental results show that the proposed method is as efficient as the manual method or clinical method.

Power Quality Improvement using FLC based UPQC

Pratik Das, Samikshya Mishra and Santanu Sen

Abstract: The quality of the power is affected by many factors like harmonic contamination, due to the increment of non-linear loads, such as large thyristor power converters, rectifiers, voltage and current flickering due to arc in arc furnaces, sag and swell due to the switching of the loads etc. These problems are partially solved with the help of LC passive filters but cannot solve random variation in the load current and voltage waveform. Active filters can resolve this problem but its cost is high. One of the many solutions is the use of a combined system of shunt and active series filters like unified power quality conditioner which aims at achieving a low cost under highly effective control. In this paper compensation principle and different control strategies based on Fuzzy Logic based controller of the UPQC in detail are used. The control strategies are modeled using MATLAB/SIMULINK. The performance is also observed under influence of utility side disturbances such as harmonics, flicker and spikes. The simulation results are listed in comparison of different control strategies and for the verification of results.

PS-DCT Image Functioned Framework for Steganography

Dr. Pallavi Khare, Dr. M. Sushanth Babu and Dr. Akhil Khare

Abstract: This research paper present a unique approach of Image primarily based steganography method wherever pseudorandom sequence generators operate is employed to randomize the mapping sequence in an exceedingly pseudorandom fashion. The embedding method of the key message is completed per the pseudo-random sequence, and extraction is completed exploitation identical sequence at the opposite side. At the bottom level, 2D-DCT is employed to cover the bits of secret message within the stego image by exchange the LSBs of DCT coefficients. Since in previous paper the LSB substitution technique is already used, here during this paper the previous concept is extended and used DCT rather than LSB technique. a replacement text randomization algorithmic rule (4-2 swap text randomization algorithm) is additionally accustomed modify the key message before embedding.

Optimization based Tuning of Fractional PID Controller for Small Hydro Power Plant

Himanshi Verma, K. Dhananjay Rao and Subhojit Ghosh

Abstract: The increased stress on the use of renewable energy has motivated the wide adoption of small hydro power plant for meeting the ever increasing power demand. The present paper proposes the design of fractional order PID controller using TLBO optimization approach for controlling the governor and excitation system of a prototype small hydro power plant. As compared to the classical integer order PID controller, the use of FOPID allows greater flexibility in achieving the controller

objectives in terms of time domain response. The controller design tasks are framed as an optimization problem and solved using TLBO. The proposed approach is found to outperform the classical PID and fuzzy PID in terms of ITAE and ISE.

Potential use of Passive Microwave Remote Sensing in Flood Prediction: A Case Study in Morigaon District of Assam, India

Bikramjit Goswami and Manoranjan Kalita

Abstract: Brahmaputra is the largest river of India and flows through the state of Assam over a length of 916 km. The river causes flood in many places in the valley along its length during monsoon season. The district of Morigaon in Assam is one of the highly flood affected districts in the state, primarily caused by overflow of river water in the Brahmaputra. The prediction of these events of flooding using conventional optical remote sensing is often not possible due to cloud cover over these regions throughout the monsoon season. Hence, passive microwave remote sensing is used in the present work to monitor the changes in expanse of river water over the Brahmaputra near Morigaon district. Polarization index derived from passive microwave brightness temperature in X-band acts as the indicative parameter for monitoring the river water expanse. In the present study, a threshold value of the average polarization index measured over six pixels on and around the river is determined for predicting flood occurrences in the district 1-4 days in advance.

Design and Implementation of Low Cost Low Loss Energy Quality Regulator for Energy Distribution Systems

Ahmet Eren and Ahmet Mete Vural

Abstract: In this paper, the design and implementation studies of an Energy Quality Regulator (EQR) for energy distribution systems are presented. EQR which is connected to the low voltage distribution type transformers as a parallel has the following capabilities such as reactive power compensation, neutral current compensation of nonlinear and unbalanced loads, and the mitigation of low order current harmonics such as 3.,5.,7. A two-level, neutral point clamped voltage source inverter (VSI) based split capacitor topology is used in the power stage of the EQR. The inverter is switched using sinusoidal pulse width modulation (SPWM) method. Reference voltages which are required for producing switching signals are obtained in the Synchronous Reference Frame (SRF). The performance analysis of EQR is realized in PSCAD simulation environment and Fieldtest results than it is shown that the EQR can balance neutral current, approach the current waveform to the sinusoid and operate the system at unity power factor.

Digital Image Correlation Techniques for Experimental Strain Analysis: A Review

Nutan Shukla and Manoj Kumar Mishra

Abstract: Strain measurement is a key element of material testing. Various contact based units exist to estimate strain viz. strain gauge, extensometer, seismic waves, acoustic emission technique etc. However, these methods have drawbacks like sensitivity issue, susceptible to external noise, vulnerable to breakage, etc. As a practical and effective tool for in-plane deformation measurement, Digital Image Correlation (DIC) technique, a non-contact based method has gain popularity and commonly being used in experimental mechanics. This method deals with finding correspondence

between images before deformation (reference image) and after deformation (degraded image). This paper is a critical review of a few aspects of the development of 2-D DIC and its approaches. The results of DIC application on a sandstone rock has also been discussed.

Common Mode Voltage (CMV) in Three Level NPC VSI using Advanced Bus Clamping Methods:A Study

Partha sarathi Behera, G. Vivek and Dr. Mukti Barai

Abstract: PWM inverters are highly used in motor drive applications in industries. The PWM switching produces common mode voltage (CMV) which in terms produces Common Mode current (CMC). This CMC can cause many adverse effects like EMI and bearing current. The different switching sequences have varying magnitude of common mode voltages. In this paper a comparative study of common mode voltage values of double bus clamping and hybrid bus clamping switching methods are made with conventional CMV in a Three level VSI. This comparative study further indicates an insight of CMV performance of various switching sequences. The Validation of the study is done using MATLAB simulation platform.

Unconventional Method of Accessing Bitmap Image Files with Missing Header

K. Srinivas and Dr. T. Venugopal

Abstract: File Carving is an unconventional method of accessing files from disk. It is a technique of reassembling unordered mixed file fragments, without using files' metadata such as FAT, for reconstructing the actual files present on the disk. In the areas of data recovery and digital forensics this technique is used. In the literature we find the methods of carving image files from its fragments on a storage media, without using files' metadata in file-system data structures [1, 2]. These methods require that the cluster containing the header of an image be available. In this paper we propose methods that can carve image files from its fragments when a header is corrupted or missing. Two different cases of this problem have been considered; 1) Only header is missing 2) A cluster containing header is missing. We have proposed an algorithm called as extendedGSUP algorithm which is an extension of algorithms presented in a paper [1, 2]. This algorithm is implemented in C++ and the experimental results are also presented. We have used the ULFS tool [3 , 4] for preparing input for testing our carving tool. This tool is also used to compare the internal structure of a header of a bitmap file with the pseudo header constructed for the purpose of carving.

Spatial Estimation of Signals in Non-Overlapping Time for ULA Antenna based Six User DS-CDMA

Amiya Dey and Arnab Nandi

Abstract: Spatial estimation of six user Direct-Sequence Code Division Multiple Access (DS-CDMA) in non-overlapping time is accomplished using Uniform Linear Array (ULA) antenna. DSCDMA users functioning in non-overlapping time can provide more robust and secure communication environment. Six DSCDMA signals are operated with Quadrature Phase Shift Keying (QPSK) modulation in Additive White Gaussian Noise (AWGN) and Near-Far Effect. Spatial spectrum and Direction of Arrival (DOA) estimate of sources are explored using MUSIC (Multiple Signal Classification) and Root-MUSIC algorithms.

Cost Effective Food Quality Monitoring using PLC: An Optimized Approach

Ayesha Kesharia, Pooja More, Komal Adeshra and Rajendra Sutar

Abstract: There are a lot of concerns in food manufacturing industries like global demand on resources, increasing number of competitors, economic uncertainty and many more. Many of the challenges faced by food manufacturers relate to meeting changing demands of consumers. Consumers need healthier food without compromise in taste. The manufacturers also need to ensure that taste, texture, shelf-life, appearance, cost and nutritional content are all maintained at a particular standard. They also need to ensure that there are very minimal differences in appearance from the original products, as any changes could result in their product failing to satisfy consumers and them opting for an alternative. This can involve significant amounts of experimentation before a suitable product is ready for market. In the race of managing all these factors in food products sometimes the quality of the food is compromised or in the race of increasing the production, while sorting stale and fresh foods some mismanagement may happen. This paper basically focuses on solving this problem. It aims at maintaining the quality of food without compromising on its texture, ensuring increased production and also striving to reduce cost of manufacturing the food packets. It measures the quality of food on the basis of two parameters i.e weight and moisture and keeps a track on the defective packets by noting their barcode number which is scanned by the barcode scanner.

Synchronization Technique for Grid Connected PV Source using d-q Reference Frame Control

Vinay Janardhan Shetty, Dr. S.G.Ankaliki, Rudresh Magadum and Pooja J Shetty

Abstract: Grid connected photovoltaic (PV) systems feed electricity directly to the electrical network operating parallel to the conventional source. This paper deals with design and simulation of a three phase inverter in MATLAB/SIMULINK environment which can be a part of photovoltaic grid connected systems. The converter used is a Voltage source inverter (VSI) which is controlled using synchronous d-q reference frame to synchronize the system to the grid. Phase lock loop (PLL) is used to lock grid frequency and phase. The design of low pass filter used at the inverter output to remove the high frequency ripple is also discussed and the obtained simulation results are presented.

Selfish Avoidance Payoff Allocation in Mobile Ad Hoc Network

Moirangthem Tiken Singh and Surajit Borkotokey

Abstract: Every mobile node must provide services in a mobile ad hoc network for sustaining the network. However, servicing others consumes resources. Because of independent and rational nature, a mobile node may refuse to provide services. This behavior leads an inefficient network. In this report, we focus on providing the solution to the problem using game theory. Various methods have been proposed using game theory to address the issue. Here ideas from non-cooperative and cooperative game theory are used for modeling the behavior of the mobile nodes. Non-cooperative game theory determined the best strategy that a mobile node shall choose in the model. Cooperative game theory explored the way to form a coalition that optimizes the benefit of each mobile node. A theoretical model is built to avoid selfish nature of the mobile nodes. The proposed model forces the mobile nodes to converge to a desirable equilibrium point by avoiding selfish nature.

Comparison of ANFIS and ANN Techniques in Fault Classification and Location in Long Transmission Lines

S. Panda, D. P. Mishra and S. N. Dash

Abstract: This paper presents application of ANFIS and ANN in fault classification and location in a long transmission line. Compared to other methods, Machine Learning techniques based on artificial intelligence perform the best in fault classification and finding its location. Most frequently used ML techniques for this purpose are ANFIS and ANN. Both the techniques were able not only to identify fault type but also to find the fault location in the transmission line very accurately using source end current and voltage data. Common training and testing data was used for ANFIS and ANN. This data was obtained from simulation of faults in a long transmission line model using MATLAB. Error analysis and comparison of both the techniques is also presented in this paper. A GUI was designed for comparison of both the methods.

Modelling & Simulation of PV System with Fuzzy MPPT based Converter

Jyotirmayee Priyadarshini

Abstract: In order to cope with increased demand of energy, an efficient photovoltaic (PV) power system is to be developed which extract the maximum power from the solar model by using Maximum Power Point Tracker (MPPT). This research is focused on the implementation of Fuzzy Logic based MPPT which is compared with conventional P&O MPPT. In first stage, PV Module with Boost Converter with Fuzzy Logic based MPPT and P&O MPPT are simulated in MATLAB/Simulink. From the simulation it is founded that FMPPT can track the Maximum Power Point (MPP) with more precisely and firstly. In second stage Quadratic Boost Converter (QBC) & Boost converter with fuzzy logic based MPPT controller (FMPPT) in different solar irradiation is simulated in MATLAB/Simulink. From simulation it is observed that QBC has high voltage conversion ratio & less oscillation in transient state compared to Boost converter.

Audio Fingerprinting with Higher Matching Depth at Reduced Computational Complexity

V Kamesh, Nagarjuna Pampana, Mohit Sinha and Shuvabrata Bandopadhaya

Abstract: In this paper, a novel audio fingerprint technique with higher matching depth at a reduced computational complexity has been proposed. Any audio clip can be identified from a huge audio collection by its audio fingerprint which contains some unique extractable and perceivable features of it. One of the major concern in the process of identification of a sample audio clip from huge audio collection is the computational complexity involved in it. In proposed technique, peak pairs are chosen from the alternate time bins sorted in the descending order of the amplitude of the spectrogram of the audio file under consideration, as opposed to the sequential selection across consecutive time bins in the decreasing order of their amplitude in the basic methods. This paper also proposes a simple mode based ranking algorithm to provide the user with multiples matches in case of a possible false positive match.

Applied Communication Technology to Support Tourism Web Collaboration at Provincial Level in Indonesia

Sulistyo Heripracoyo and Suroto Adi

Abstract: Basically tourism websites were developed for the purpose of disseminating information on tourism products and attracting tourists to visit tourism destinations. Tourism business is not a single business but there is number related business such as transportation, hotel, culinary, and tour and travel as well. Currently, at the provincial, and the office of tourism and the business actors have owned website but their websites were generally built apart from each other. So that, indirectly the existence of the website has not been optimal in boosting the increase in the number of tourists visiting Indonesia. The current communication technology enables to support collaboration between websites so as to increase access the tourism promotion and marketing. This paper aims to see the potential benefit of communications technologies that currently available to enhance web collaboration among web business actors. The method used is literature study, tourism legislation study, and field survey. The expected result is the design of the usage web communication technology which potentially increases the effectivity of tourism websites at the province level.

Impact of Fault Location on Sub-Synchronous Resonance in Series Compensated Type 3 Wind Power Plant

Gajanan V. Gotmare and Dr. Vasudeo B. Virulkar

Abstract: Sub-Synchronous Resonance (SSR) is a wellknown destructive phenomenon occurs due to series compensation of existing transmission line connected to wind power plant (WPP). Mid line and end line capacitors are installed for series compensation. However in India end line capacitors are installed to reduce installation cost. Various studies regarding impact of power output, variable wind speed and series compensation level on SSR in series compensated WPP is found in literature. No work has been carried out in literature regarding the impact of fault location on SSR in series compensated type 3 WPP, where the capacitors are located at far end of the transmission line. A first bench mark (FBM) model is adopted with type 3 WPP for this study. Electromagnetic transient simulations using MATLAB/Simulink have been carried out to study the impact of fault location on SSR in series compensated type 3 WPP.

Optimal Planning and Operation of Microgrid: A Comprehensive Review

Nalini Telu, R Gowrisankar Rao and V S Vakula

Abstract: The advanced development in distributed generation technologies associated with power electronics and continuous threat of carbon emission, increasing the fossil fuels cost and its availability encourage the integration of Microgrid(MG)s into the electric power system. Even though the developments in MGs are there, still many challenges are there to mitigate for an efficient and reliable operation of microgrids. This paper presents a detailed review of planning and operation of Microgrid, which includes the concept of MGs, utilization of distributed energy resources, uses of energy storage systems, integration of power electronics to microgrid, protection, communication, control strategies and stability of microgrids.

A SFS Tuned Fuzzy PI Controller for a Hybrid Power System with Electric Vehicles

Sasmita Padhy, Rajendra Ku. Khadanga and Sidhartha Panda

Abstract: In this paper a two area Hybrid power system is considered Each area consists of a conventional Thermal power system integrated with Distributed Energy resources along with a mass EV module. Presence of Distributed Energy Resources in the power system makes the system more susceptible towards frequency instability against variation of load demand. For alleviating the LFC problem an effective Fuzzy PI controller together with the EV module is presented here. Firstly the standard controllers like PI, PID are used to diminish the frequency deviation and an EV module is added with each controller to further reduce the abnormality in frequency. A new metaheuristic technique Stochastic Fractal Search is used to tune the parameters of standard controllers. At last a SFS tuned Fuzzy PI controller with EV module is recommended which makes the frequency inconsistency tiniest. The excellence of the controller with EV can be proved making comparisons with standard controllers in the presence and absence of EV. All these are showcased using MATLAB Environment.

An FOPI Controller Design for Coupled-Tank TITO Process using Whale Optimization Algorithm

Gandikota Gurumurthy, Dushmanta Kumar Das and Abhishek Srivastava

Abstract: In the present paper, a design approach of Fractional-Order-Proportional-Integral (FOPI) controller is proposed for decoupled two tank TITO process. A decoupler is designed using inverted decoupling technique to make TITO process into two separate SISO processes. As there are three unknown parameters of the FOPI controller, we have used phase margin, gain crossover frequency and velocity error constant specifications to get a objective function for optimization based control design approach. After obtaining the objective function, the optimization problem is solved by Whale Optimization (WO) algorithm. Both simulation and real-time results reveal that the FOPI controller performs better than the PI controller for decoupled two tank process. It also noted that the design approach of FOPI controller is not complex and easily implemented for real-time two tank TITO process.

Design of Cost-efficient Fuel Cell using Domestic Waste and Cowdung and Investigation of Accurate Mixture Ratio for Efficient Output

Tuhinanshu Mishra, Swapnil Srivastava and Abdul Zeeshan

Abstract: In the new age technological world, energy consumption has become the first priority of orienting the inventions and other technical developments. Any new device that is to be developed is always tested for the outputs that it can produce with respect to the fuel used to power it up. In places where we do not require very high quality of power input, we can use alternate energy sources so that the costlier fuels can be saved for powering up loads that demand high wattage. In this research paper, we designed a microbial fuel cell which is a source of energy that requires entirely waste material and puts it to reuse by producing acceptable voltage output. We used a fuel combination of cow dung and vegetarian diet kitchen waste. By mixing it in all possible ratios, we determined the best ratio of mixing the fuel so that the output would be maximum and the resultant build-up would be most

suitable for energy generation along with being cost-efficient. If such a device is manufactured in large scale then it can behave as a trustable source of secondary power source.

A Fractional Order PI (FOPI) Controller Design for Shunt Active Power Filter to Improve the Power Quality

Abhishek Srivastava, Dushmanta Kumar Das and Gandikota Gurumurthy

Abstract: In this article, a Fractional Order Proportional Integral (FOPI) controller based shunt active power filter (SAPF) is proposed. The FOPI controller is designed to have a constant voltage of the DC-Link of the SAPF which is used for the elimination of harmonics and there by to improve the power quality. To design the FOPI controller, phase margin, gain crossover frequency and velocity error constant are taken as desired specifications. For harmonic current extraction and gate signal generation, instantaneous active and reactive power (P-Q) approach and pulse width modulation technique (PWM) have been used. In order to show the effectiveness of the proposed FOPI controller in maintaining the a constant voltage and in eliminating harmonics thereby improving the power quality of the system, SAPF model is developed in MATLAB/SIMULINK and the effectiveness of the designed FOPI controller is analyzed. The results obtained with FOPI controller illustrates that the FOPI makes the system to have a the constant voltage of the DC-Link and compensates the harmonic components present in the system.

A Secured Patients Monitoring System using Sensor Nodes in Health Care Institutions

Pabitra Mohan Khilar, Swasti Sadhan Khatua and Rakesh Ranjan Swain

Abstract: Telemedicine is one of the hot research topics which provides health-care solutions to remote areas. There are various situations, where telemedicine plays a vital role. Nowadays psychiatrist use cloud computing to come across their patients from remote places, which makes their job easier. This is called tell the psychiatrist. As the patients maintaining many numbers of queues, the urgent patients have to wait in the same queue with normal patients, and they wait for their respective time. This situation is undesirable. Then the collection of real-time monitoring of patients vital data becomes a tedious job. A model is proposed in our paper where a single doctor is taken into consideration. A micro-controller model is being used here which consists of various smart sensors inside it. The smart sensors are kept intact with the patient's body. A support staff (named as ward boy) attaches the particular smart sensors to the particular patient's body. Then the sensors start recording the patient's vital data and they send it to the central database system. The model is strictly concerned about the minimization of the traffic intensity and the maximization of the throughput. As the proposed model works on WSN environment possibility of various attacks increases. One of the most important attack is considered, Black hole attack. To make our Model robust, a security algorithm is added in this model, which eradicates the complications from the sensors. The salient features of the security algorithm are also described.

Design and Implementation of an Internet of Things based Prototype for Smart Home Automation System

Kshirod Kumar Rout, Samuchita Mallick and Sivkumar Mishra

Abstract: The concept of automation coupled with advancement in technology and Android based smart phones have resulted in refined and smart lifestyles. When automation as a concept gets

implemented via internet of things (IoT) which is concerned with accumulation /aggregation of connectivity, it gives rise to a smarter home network. In this paper, an IoT based prototype of a smart home automation is designed and implemented. The proposed prototype smart home system along with its Android App and ATmega16 as its main controller is successfully implemented and the results of the implementation are presented.

Review of Speech Enhancement Methods for Real-time Speech Signals

Alaka Pradhan, Susanta Kumar Sarangi, Kanhu Charan Bhuyan and Subhashree Priyadarshini

Abstract: Real-time speech signal, generally contaminated with various types of noises. Speech signal based real-world pattern recognition system is affected due to that. Researchers in this domain try different speech enhancement techniques to reduce the affect of noise in a speech signal. In this paper, we do a rigorous study on various speech enhancement methods with real-world speech signals. Weshow in various plots the different output waveform of the speech enhancement methods.

Detection of Speech under Psychological Stress During Exam

Bhagyalaxmi Jena, Anket Biswal and Sudhansu Sekhar Singh

Abstract: Speech is a difficult signal that encipher the information about the speaker. By just hearing the words of a speaker we cannot determine whether a person is under stress or not. In this paper Spectrogram Analysis, Cepstrum Analysis and Welch Power Spectral Analysis were done to find out which one is better for the detection of stress speech signal.

A Comparative Analysis of Different Topologies of an Eleven Level Inverter for Solar Power Applications

Kshirod Kumar Rout, Abinash Tripathy, Onkar Sahu and Sivkumar Mishra

Abstract: This paper presents a comparative analysis of four different topologies of an eleven level inverter (ELI) based on criterion like total harmonic distortion (THD), complexity of the circuit and numbers of switching devices and components considering solar photo voltaic cells via boosters as input sources. The topologies considered are neutral point clamped or diode clamped type, flying capacitor type, cascaded Hbridge type and the reduced switch version of the cascaded Hbridge type. These configurations are modeled in MATLAB/simulink software environment for an eleven level inverter. Each switch of the single phase ELI is controlled by giving pulse with the help of PWM generator. The comparison results are presented and discussed.

Designing and Sizing of a Standalone Photo Voltaic System: A Case Study

Kshirod Kumar Rout, Ansuman Das and Sivkumar Mishra

Abstract: This paper deals with various aspects relating to designing and sizing of a standalone photo Voltaic (SPV) System. A typical case study of designing and sizing of a SPV system for a location in Bhubaneswar, India is presented. The system sizing presented in this paper primarily deals with meeting the daily electrical requirements for a residential house.

Comparative Analysis of Clustering Techniques in Cloud for Effective Load Balancing

Akankshya Aparajita, Shrabanee Swagatika and Debabrata Singh

Abstract: Clustering is used as an important procedure in the process of data mining, where information of large datasets is transformed into meaningful and concise data. It performs activities like pattern representation, using of clustering algorithms and their validation, data abstraction and finally result generated. Clustering has many categories of algorithms such as partition-based, hierarchical-based, density-based, grid-based etc. Partition-based is the centroid-based clustering. Hierarchical-based clustering is link-based. Density-based is clustering is focused on area of higher density in the dataset. Grid-based clustering relies on size of the grid. In this paper, we discussed different clustering techniques as well as, a detailed review on the partition-based and hierarchical-based algorithms. Finally we compare clustering algorithms on the basis of attributes like time complexity, capacity of handling large datasets, scalability, sensitivity to outliers and noise, and also discussed result after solving a particular dataset implemented in cloud computing environment.

Design and Simulation of a Standalone Photo Voltaic System using Synchronous Boost Converter and Reduced Switch Five Level Inverter

Kshirod Kumar Rout, Kalyan Srinivas and Sivkumar Mishra

Abstract: This paper presents the design and simulation of a standalone photo voltaic (PV) system. To convert dc voltage obtained from the solar panels, which varies with the temperature and light intensity, synchronous boost converter (SBC) accompanied with maximum power point tracking technique (MPPT) is used. The SBC with a negative feedback loop path with P-I controller is used for maintaining the voltage constant. In order to drive ac loads, the constant dc voltage outputs of two SBCs are fed to a reduced switch five level (RSFL) inverter circuit resulting in ac output voltage to drive ac loads. SIMULINK models and the output waveforms of the solar panels, SBCs and the RSFL are presented in this work.

Location of Fault on Transmission Line using Impedance and Travelling Wave based Method

Basanta K.Panigrahi, Bhagyashree Parija, Raturaj Pattanayak and Pravat K. Rout

Abstract: Faults should be cleared on the transmission line as soon as possible. Smaller time for the fault clearing has many merits like less threat of damaging equipment's, reduced loss of income, better customer satisfaction due to improved quality and reliability of power supply. Fast restoration of supply is possible, if accurate location of fault method is used. This paper gives the basic idea of the fault location calculation using the impedance method and travelling wave method in a DG based power system. One practically applicable 3-bus system incorporated with various types of distribution generations are considered for the protection analysis purpose and is simulated using MATLAB/SIMULINK environment. The location of fault is done using impedance based method and travelling wave method. The comparison results are presented which demonstrates the enhanced performance of both the methods.

Double Priority based Load Balancing Algorithm for Cloud Computing

Sangeeta and Suman

Abstract: One of the problem in cloud computing is providing services with good quality, maintaining deadline and increasing successful tasks. To do this a load balancing algorithm is required which can distribute the load fairly on different resources resulting in effective resource utilization and completion time. A load balancing algorithm should decrease makespan time while increasing resource utilization and satisfying user requirement i.e. deadline, quality parameters. This paper presents such a dynamic load balancing algorithms. Main focus of this algorithm is to increase makespan time, resource utilization and successful tasks. This algorithm takes deadline and length of task as priority and sort the tasks based on this. To schedule the tasks on resources modified sufferage algorithm is used. Results are computed over different number of tasks (100-170) to test it fully. Results shows that, propose algorithm decrease makespan time, increase resource utilization and increase number of successful task. This algorithm is compared with modified min-min algorithm and use Cloudsim as simulator.

Online Food Review Quantification based on Dynamic Sentence Evaluation

Muhammad Usama Islam, Mafuza Akter, Sarna Mukta and Abdul Alim

Abstract: The emergence of food outing culture amalgamated with information and technology aided human being to ease the process to find and dine in a nice restaurant. However, with the emergence of user-based reviews and social media posts that discusses the text-based sentiment of food critic often leaves the actual analysis of a dining experience. So, the importance of online food review has evolved notably with advancement of information at ones fingertip. Identifying and categorizing reviews of restaurant automatically became important. Using opinion mining and sentiment analysis added to a Naive Bayes method, we propose an intuitive approach of polarizing reviews from a food review. Our approach consists of a food review paragraph to sentence segmentation phase, followed by a library for data pre-processing of oral English to written English and at last marking whether the reviews are positive or negative through standard learning procedure. Our approach detects the polarity of quantification of food critics with around 87.5% accuracy rate. The conversion of oral English to formal English before fetching for learning is the key factor which resolves the issue of finding out the meaning of the sentence which holds the polarity of the sentence.

Relative Study of Routing Protocols in Diverse Topologies using NS2 Simulator

Prasant Kumar Dash and Madhumita Panda

Abstract: A mobile ad hoc network (MANET) is an autonomous system where the nodes are mobile and can communicate with each other using wireless links without utilizing any fixed based station infrastructure and centralized management. Mobile Ad hoc network is a network where the nodes are connected via wireless channels and can use multiple hops to exchange data. Routing protocols such as proactive and reactive are needed for communication in such Ad hoc networks, where it targets for efficient and timely delivery of message. The structure of the network means topology is the important factor for measuring the performance of the network. Here, we have analyzed the performance of

routing protocol over the different topologies like chain, grid and parking lot. And also considering the performance of responsive and unresponsive flow of the network. The results are analyzed depending upon the simulation parameters like throughput, delay, jitter, packet delivery ratio, packet drop. Simulations are done using NS2 and the graphs are plotted by using gnuplot.

Simulation and Fabrication of 27-level PV Inverter

Aman Deep Masih, Aravapalli Avinash and A. Immanuel Selvakumar

Abstract: Typically, Multilevel Inverter has many advantages like good efficiency, low cost and application in PV. There are many types of MLI one type is Cascaded H-bridge Multilevel Inverter. After Forming switching pattern and switching angle 27-Level inverter with DC sources and PV panel with MPPT is simulated and fabricated.

Multibeam Generation using Optimization Techniques

R. Krishna Chaitanya, Dr.P.Mallikarjuna Rao, Dr.K.V.S.N.Raju and Dr.G.S.N. Raju

Abstract: Generation of multi beams with equal height is complex and involved. The literature to trial with this problem is very limited. However, an effort is made in this present work to generate such complicated patterns using state-of-the-art optimization algorithms. Few arrays are considered to generate multi beam by applying Firefly and PSO algorithms. The values of parameters of elements in array antennas are varying in nature. The results realized by applying Firefly and PSO algorithms are correlated and normalized patterns are conferred in U domain. Communication between multiple users is made easy by using antennas with multi beam. The trial of this work is very significant as the generated pattern doesn't exhibit any side lobe and hence EMI problem is eliminated.

Isolated DC-DC Converter with Secondary Side Phase Shifting

J.Sivavara Prasad, G.Nageswara Rao, K.R.L.Prasad

Abstract: In this paper is a secondary side phase shifting (SPS) technique has been developed for two-level isolated dc-dc converter. This scheme provides wider soft switching range and reduced power loss due to elimination of circulating current in the primary side of high frequency transformer. In addition, SPS control also provide no reverse recovery current in diodes and hence no power losses in the secondary rectifier circuit. The control switches operate under soft switching even under rated load and short circuit conditions. The proposed work has been implemented and it is verified through simulation results. In this chapter various operational modes, control strategy, design equations and control range of soft switching for the proposed seven-level dc-dc converter topology are given. The performance of the proposed seven level isolated dc-dc converter has been implemented using MATLAB/ SIMULINK software.

Simulation of Indirect Field Oriented Control of Induction Motor Drives using SMO based MRAS by ANFIS Controller

M.Ankarao, M.Vijaya Kumar and Shaik Asiya Sulthana

Abstract: The research focuses on three particular aspects of IFOC. The first aspect is the parameter estimation methods to overcome the negative influence of parameter mismatch on the field orientation and then on the performance of the IFO induction motor drives. The second aspect is the proposed

method is implemented through a MRAS scheme through the rotor flux. A second order SMO and a terminal SMO are two SMO's which comes from the reference model which are operated in series. The third aspect is the impact of rotor flux loss existence on accuracy of IFOC and means for rotor flux loss compensation is done by both Fuzzy Logic Controller and Adaptive Neuro Fuzzy Interface System (ANFIS). Both speed and torque mode of operation is covered by extensive theoretical considerations and numerous simulations by using two controllers.

Design and Simulation of a Modified MOSFET Having a Doped Pocket Region in the Substrate

Prasenjit Saha and Bijoy Goswami and Subir Kumar Sarkar

Abstract: A moderately doped pocket region is inserted at bottom of the substrate of an N-MOSFET, in order to increase the majority carrier concentration in the channel. Base of the Substrate is insulated by SIO₂, so that there is least possibility of leakage through it. The Device designed is of 20nm channel length and a Simulation based study has been carried out. In order to perform analysis and comparison the same is designed with 30nm and 40nm channel length and conventional MOSFET of 30nm and 40nm are designed. Device characteristics obtained from the simulation shows that it follows the characteristics of the conventional MOSFET. On comparing the drain current of the modified MOSFET with the conventional one, the modified structure performs better. On performing Leakage Current analysis it is found that of the modified MOSFET has a smaller value than the conventional MOSFET.

Modeling and Performance Analysis of Wind-SPV Hybrid Renewable Energy System Integrated to Grid

Abhisek Gantayat, Kamal Kant and Dr. Santi Behera

Abstract: Since standalone operation of either Photovoltaic or wind energy system does not offer a very reliable source of electricity production, mainly due to the unpredictability over the availability of the wind and solar irradiance. Thus, an assortment of wind and solar power generation structure can form a very much potential and reliable source of electricity. This kind of system is very beneficial and useful to the remotely located or islanded areas where grid integration is not very economical. In this paper, a computer simulation model of hybrid wind-PV generation system of capacity 750 KW has been presented. The performance of this system with grid connected mode is analyzed. The power quality of the wind-SPV hybrid system has been evaluated by calculating the total harmonics distortion (THD) at different wind speed.

Design of Evaluation Board for Image Processing ASIC and VHDL Implementation of FPGA Interface

Chaitra M, Dr Aravind H S, Anantha Shayanam G R and Harish Bohara

Abstract: The growing usage of reconfigurable Field Programmable Gate Arrays (FPGAs) and increased number of Application Specific Integrated Circuits (ASICs) designed for different applications have uplifted the technology to certain level compared to previous decades. The paper aims at building a FPGA based evaluation board to verify the functionality of the image processing ASIC. It provides complete information about building the evaluation board, different aspects in VHDL implementation and coding strategies to configure the FPGA. The code is executed in XILINX

14.5 design suite and simulated using Questa sim 6.3c simulator. Simulation results are presented at the end and are functionally checked. The different components and ICs used are precisely explained. This paper thus provides an efficient and fast ASIC verification process on a FPGA based platform. The board is cost effective since the FPGA is cheap and is easily available and the re-configurability of the FPGA makes the project more effective.

A Smart Incubation System

Arijit Ghosh, Lina Mondal and Somadrita Chattopadhyay

Abstract: The designed system can monitor temperature and relative humidity of the incubator. It is also capable of monitoring the heart rate of the baby inside it. Temperature and relative humidity monitoring is done in order to keep the environment suitable for neonates. It also helps to detect many other diseases like infections, common cold, and pneumonia. Continuous heart beat monitoring helps to detect any kind of cardiovascular disorders like arrhythmia or irregular heartbeats. When the measured temperature value drops below the set value, the heating pad is turned on and when the temperature increases and reaches to the set point the heating-pad turns-off.

Use of Particle Swarm Optimization for Feature Selection and Data Mining Methods for Efficient Detection of Automobile Insurance Fraud

Anmol Pattanaik and Suvasini Panigrahi

Abstract: In this research, we have carried out a systematic study in automobile insurance fraud detection. The fraudster, their main types and subtypes of known insurance frauds has been defined. We have categorized, compared, and summarized from almost all published technical and review articles in this domain within the last 10 years. A novel scheme has been proposed that uses a Particle Swarm Optimization (PSO) based feature selection method for extracting irrelevant and redundant features in automobile insurance dataset. As the dataset is highly skewed in nature, we have devised a Quarter Sphere Support Vector Machine (QS-SVM) based under sampling approach for data balancing. Thereafter, we have employed Decision Tree (DT) and Logistic Regression (LR) for classification purpose on the balanced data. The effectiveness of our proposed methodology is evaluated experimentally using a real world automobile insurance fraud dataset taken from literature.

Health Guardian - A Subsidiary Android Application for Maintaining Sound Health

Md. Nasfikur R. Khan, W. Faarhin Durdana, Robin Roy, Gobinda Poddar, Sabrina Ferdous and A K Ehsanul Haque Mashuk

Abstract: Mobile phone is one of the most convenient device for people all over the world for daily activities. Apart from the ease and automation of its use, it also minimizes the overall time needed for a task to complete manually. With keeping pace with the increasing use of smart phone, we have created an android application naming it, Health Guardian. The ultimate goal of this application is to notify about the calorie level in a food and monitor the amount of calorie burned after performing exercise. The additional benefit that the app will provide the identification of food calories users consume. The application features a monitoring system to count your daily nutrients and food consumption. The list of updated food items along with their calorie amount and other details are also

recorded within the app. The preliminary test of the app found were very helpful, as it will notify the user about the calorie level of the food and what exercise will burn out those calories. The results obtained were very positive and we look forward to increasing the users of this app throughout.

Remote Health Monitoring of Transformer using Internet of Things

Baldeep Singh Nagi, Swarupa Mishra and Gagandeep Kaur

Abstract: The paper deals with continuous monitoring of distribution transformers remotely over web falling under the class of Internet of Things (IOT). The three sensors sense the value which are further converted to digital signals through Analog to Digital Converter and then send them to the microcontroller. The sensed data are then sent through a Wi-Fi module under (TCP/ IP) convention to a dedicated IP that shows the information continuously in any internet associated Laptop/Computer. The continuous information of the three sensors are displayed on a LCD interfaced to the microcontroller. The performance of prototype model developed is tested for monitoring of transformer parameters like current, voltage and temperature.

Electromagnetic Properties of Vanadium Pentoxide and Sodium Silicate Added Lithium Ferrite Sintered at Different Temperatures

Jangkhohao Touthang and Mamata Maisnam

Abstract: Lithium ferrite: $\text{Li}_{0.5} \text{Fe}_{2.5} \text{O}_4$ was prepared by ceramic method adding (0.1 wt %) of Vanadium Pentoxide (V_2O_5) and (0.1wt %) of Sodium Silicate (Na_2SiO_3) as additives and using planetary ball milling. The prepared samples were sintered at different sintering temperature viz. 900°C , 950°C , 1000°C , 1050°C , 1100°C for 1hr. XRD studies confirmed the single phase spinel structure in all the samples. SEM studied the microstructure of the samples. The room temperature frequency variation of dielectric and permeability behaviour was measured using an impedance analyzer. The studies found that the sintering conditions significantly influence the properties studied. Permeability resonance frequency has been found to be highest for samples sintered at 950°C . The results of measurements are discussed in the paper.

Effect of Vanadium Pentoxide Layer in the Photovoltaic Properties of Dye Sensitized Solar Cell

Arya Vasanth, C.O.Sreekala, Jinchu.I and K.S.Sreelatha

Abstract: The Dye Sensitized Solar Cell (DSSC) should play an immense role in the future of solar energy. In this ongoing study, the effect of vanadium pentoxide layer in the photovoltaic properties of dye sensitized solar cells is investigated by coating vanadium pentoxide and titanium dioxide in different order like $\text{V}_2\text{O}_5/\text{TiO}_2$, $\text{TiO}_2/\text{V}_2\text{O}_5$, $\text{TiO}_2/\text{V}_2\text{O}_5/\text{TiO}_2$ and TiO_2 only. Substrates thickness and morphology is found to have a direct impact on the cell efficiency. Scanning Electron Microscopy (SEM) is used to investigate the substrates nanostructure. Standard solar cell current-voltage characterization techniques are evaluated to study the photovoltaic performance of the cells. It is found that the device with one layer of TiO_2 alone gives a better current and efficiency. By looking at the 3 different modifications that are studied, the sandwich structure $\text{TiO}_2/\text{V}_2\text{O}_5/\text{TiO}_2$ & the one with TiO_2 on top is giving comparatively better current, this is due to the dye loading capacity of the layer. When the V_2O_5 layer is placed on top of TiO_2 it limits the access of dyes to TiO_2 layer below making a

barrier to charge carrier injection. This creates a blockage for the electrolyte to access the dye which limits the regeneration.

Dynamic Performance Analysis of Double fed Induction Generator using Adaptive Neuro-Fuzzy Interference system in Microgrid

Sri Krishna Kumar.S and P.K.Dhal

Abstract: The proposed work clarifies the functioning of hybrid system with the voltage compensation in a micro grid. The hybrid system under discussion is the combination of a wind turbine and solar PV system. The wind turbine is governed by adaptive Neuro-Fuzzy Interference System (ANFIS) and the PV system is managed by MPPT. The ANFIS comes into picture along the rotor side converter of the doubly fed induction generator (DFIG). This proposed work is to maintain the voltage regulation in the wind energy conversion system. The important issue to be resolved is the reduction of torque ripples. The response of the hybrid system controlled by ANFIS is analyzed using Matlab- Simulink by designing an unbalanced micro grid.

Cloud based Global Telemetry System for Physiological Signal Monitoring

Vyankateshwar G. Girhepunje, Dr.Virendra K.Taksande and Sonal R. Chakole

Abstract: To provide economic telemedicine to the patients living in the interior part of the globe is the need today. So as to serve such patients efficiently, a low power, low cost, highly portable wearable wireless telemedicine system may be a possible solution. In this paper, a cloud-based physiological signal monitoring system implemented for continuous cardiac monitoring is presented. The system consists of an ECG sensor Module, one wire digital temperature sensor, an ultra low power MSP432 MCU and IOT Module. The system presented in this paper acquires body temperature by one wire digital thermometer DS18B20 without any extra ADC hardware. A power efficient 3- lead ECG sensor module AD8232 captures ECG and hence measures heart rate. The temperature value and ECG signal acquired from respective sensors are processed by an ultra low power high speed cortex core MSP432P401R processor/controller. In This paper it is tried to transmit important as well as an essential physiological signals of the patient over the globe using cloud technology. The temperature and the ECG signals are transmitted on to the cloud with the help of ESP 8266 Node MCU. The signals at transmitting and receiving end are compared and analyzed. This system proposed in this paper seems to be an efficient solution for wireless patient monitoring using cloud technology.

A Novel Ultrathin Pixelated Wideband Metamaterial Absorber using Wind Driven Optimization Algorithm

Prakash Ranjan, Arvind Choubey, Santosh Kumar Mahto, Rashmi Sinha and Chetan Barde

Abstract: In this article, a novel wideband metamaterial absorber is proposed using Wind Driven Optimization Techniques for the various applications of X-band (8-12 GHz). The unit cell of the proposed absorber is synthesized by pixelated FSS (Frequency Selective Surface) by taking effect of small square shape metallic pixels. The proposed absorber has more than - 10dB absorption from 7.56 GHz to 11.97 GHz i.e, 4.89 GHz of 90% absorptivity bandwidth. It has FWHM (Full Width at Half

Maxima) bandwidth of 6.21 GHz to 13.17 GHz. It also has 3 absorption peaks at 8.2, 10.5 and 11.8GHz with absorptivity of 99.89, 98.92 and 96.74%. The unit cell dimension is in a low profile with 16.5mm .5mm. The thickness of absorber is 3.2mm which is 0.104₀ and hence it is ultrathin. The absorption mechanism is explained by retrieving and plotting electromagnetic parameters such as ϵ_{eff} and μ_{eff} . The proposed absorber can find its various applications such as RCS reduction, cavity resonance reduction, electromagnetic interference reduction and covers wide areas of X-band applications.

A Novel Implementation of PFC Converter using PCCM Boost Technique

Ramya S Rajan, Kiran R and Rajath G R

Abstract: This paper proposes a novel pseudo-continuous conduction mode(PCCM) boost for power-factor-correction (PFC) converter. A power switch in parallel with an inductor is connected to operate boost converter in PCCM mode. This technique provides an additional degree of control freedom to realize PFC control. PCCM boost PFC converter can be designed to realize output-voltage regulation. The PCCM boost PFC converter has been exploited through the dead-zone control technique, which can be dynamically adjusted in accordance with the output voltage ripple. The simulation and Analysis of PCCM boost PFC converter have been presented and its response is faster than existing boost PFC converter.

Optimal Placement Technique for PMUs during Contingency & Analysis of PMU Signal for a Detection of Disturbance in a Power system

Kiran R, Dr. B.R. Lakshmikantha and Usha S

Abstract: Electricity play a very important role in human life. The advent of global electrification drives the world advancement in technology in every industrial sector. Power system stability & reliability of these power systems mainly relies on the operating constraints, conditions & several elements, factors. PMU (Phasor measurement units) uses synchronization signals provided by the GPS (global positioning system) satellites and provide the voltage and currents phasors measured at a given node. To avoid the redundant use of PMUs, the optimal locations for the PMUs must be determined. The main objective of this research paper is to place a minimal number of PMUs during contingency, so that the system can be effectively observable & the implementation for on-line estimation of the power system and for security monitoring. The event detection techniques are utilized to detect the event or disturbance in the power system. This event detection techniques are implemented in MATLAB. Online voltage stability monitoring tool has been framed to evaluate the voltage stability of the system. This was tried on IEEE-14 Bus system & the results were found to be effective.

Energy Harvesting of Piezoelectric with Synchronized Switch Harvesting on Inductor

Vishnu Sidharthan P, M. Udaya Bhasker, Srikanth Korla and M S Chandrasekhar

Abstract: Energy harvesting is the scavenging of energy from different energy sources. Vibration energy that is not used in our daily life can be utilized by extracting and conditioning it to a usable

form by using piezoelectric material (PZT) is discussed in this paper. Piezoelectric Energy Harvester (PEH) will convert the vibration energy in to electrical energy. Different circuits are used as an interface to condition the PZT output. Full bridge energy harvester (FBEH) and Voltage doubler energy Harvester (VDEH) simulations are conducted and results confirms that the VDEH provides double the output voltage compared to FBEH. New energy harvesting scheme is also developed as the energy from PZT is not going completely to the output during each half cycle. At a small interval the output current is zero while the input voltage have to build to a voltage level make to the diodes of rectifier circuit to conduct. Hence a switched inductor is introduced at regular interval at each half cycle of voltage to flip that voltage in short period of time to reduce the power losses occurring in VDEH and FBEH. Synchronized Switched Harvesting on Inductor (SSHI) improve the output of PEH with the LC circuit developed during the circuit operation. MATLAB and MULTISIM simulations are done for all the circuits and the results are analyzed. The power loss is reduced with the SSHI scheme when compared to FBEH and VDEH. SSHI technique can be treated as a technique for extracting maximum power from PEH.

A Survey on Passive, Active and Semiactive Automotive Suspension Systems and Analyzing Tradeoffs in Design of Suspension Systems

Sanjay S Eligar and R M Banakar

Abstract: Safety, reliability and cost are the major driving factors for research in automotive applications. Automotive suspension systems play a vital role in ensuring the comfort and safety of a vehicle. This paper presents the basic needs of a suspension system, and how they are met using passive, active and semiactive suspensions. The various components and parameters are surveyed and briefly discussed here. The tradeoffs in design, ride comfort vs road handling are demonstrated using simulation models. The comfort criteria is better at lower frequencies (1-2 Hz) where it is around 45 dB with moderate road holding. The road holding at low and high range frequencies is superior, while degrading at mid frequencies. The comparison among various techniques are presented, which provide a direction for further research.

Significant Bit Contribution in Robust Feature Extraction for Dermoscopic Image Classification

Rik Das, Saurav Ghosh, Sunirmal Khatua, Aritra Sen, Sudeep Thepade and Mahua Banerjee

Abstract: Augmented episodes of melanoma, a curable skin cancer variety of antagonistic nature, have stimulated the advancements in designing systems for computer aided diagnosis of the disease. Clinical diagnosis includes primary vetting of the symptoms followed by a biopsy and necessary medical examinations. However, computer based classification of the clinical images of dermoscopy have the potential to diminish the exertion of the dermatologist by offering a computer aided opinion independent of medical know-how. Assorted methods have been proposed in recent times including the deep learning techniques for computer based melanoma recognition. But, most of the techniques have enhanced feature dimension which has added to the computational complexity of the entire system. In this work, the authors have attempted to design light-weight feature extraction techniques from high level bit planes of dermoscopic images by ignoring the noisy slices of bit planes for robust feature extraction. The proposed method of feature extraction is tested with three different classifiers for specificity and sensitivity outputs of the dermoscopic images. The results of classification have outclassed the performance of state-of-the-art feature extraction techniques.

Investigation of Metamaterial and its Design Approaches

V. Koushick and C. Divya

Abstract: This paper describes about the metamaterial. Metamaterial MTMS is the arrangement of “artificial” elements in a periodic manner providing unusual electromagnetic properties. These artificial structures designed to have properties not available in nature [1]. The artificially constructed metamaterial have become of considerable interest, because these materials can exhibit electromagnetic characteristics unlike those of any conventional materials. The specific types of behavior that have been demonstrated over the past few years, illustrating the new physics and new applications possible when we expand our view as to what constitutes a material. In this review, we describe recent advances in metamaterial research and discuss the potential that these materials may hold for realizing new and seemingly exotic electromagnetic phenomena.

Overlapped Feature-preserving Multiscale Error Diffusion for Digital Halftoning

Nihar Ranjan Panda and Ajit Kumar Sahoo

Abstract: A new digital halftoning process established on multiscale error diffusion technique is suggested in this paper. In this work an overlapped feature modified multiscale error diffusion technique is proposed. The noticeable features of the algorithms are 1. Image quadtree, 2. Selection of the dot through maximum intensity guidance theorem, 3. Feature modified non causal diffusion of error. The superiority of the halftoned is assessed through subjective and objective estimation. For the objective evaluation mean square error and universal quality index are considered in this paper.

Application of SOS based PDPID Cascaded Controller with Double Derivative Filter for AGC of Interconnected Power System

Subhadra Sahoo, Geetanjali Dei, Nimai Charan Patel and Binod Kumar Sahu

Abstract: This paper presents the automatic generation control of a two equal area thermal system employing Symbiotic Organism Search (SOS) based PDPID cascaded controller with double derivative filter. Initially SOS based PID controllers are optimally designed for both the areas and then the proposed controller is designed for the same power system. A disturbance of 0.1 p.u is employed in area-one and integral time absolute error is taken as objective function for the study. Results obtained are compared with the newly published article based on SOS and Quasi-Oppositional SOS (QOSOS) algorithm based PI controller. It is finally observed that SOS based PDPID cascaded controller with double derivative filter outperforms other controllers in every aspects.

Energy Efficient Green Mobile Communications in India by 2020

Babji Prasad Chapa, Sasibhushana Rao Gottapu and Vinod Kumar Mogadala

Abstract: Energy efficiency is an important issue in the proposed next generation wireless communications by 2020 as it severely effects the human life on the earth surface mainly on two factors has become energy concern during the past decade. The two factors of concern are global warming due to CO₂ emission and sea level raise. Further, this issue has become more concern due to the ever increasing demand of data rates, spectral efficiency and quality of service combining with massive IoT communications. Therefore there is need to develop a green mobile communications by

2020, which can give reduced energy consumption and increased battery life besides increased capacity to enable massive deployment of small cell base stations. The proposed wireless communication network with the above features is referred to an energy efficient green mobile communication (5G). In this paper a survey of various technologies that are proposed for realization of the green mobile communication have been discussed in brief. Various technologies proposed for the realization of 5G are simultaneous wireless power and information transfer, massive multiple input multiple output, millimeter waves and beamforming. Analysis has also been carried out in case of the proposed massive MIMO antennas and beamforming technique as a case study of energy efficient architecture.

Integrated Energy Management of Photovoltaic Panels and Fuel Cells for Residential Houses

Raghava Nirati, Kuo-Wu Chien, Zolboo Damiran and Leehter Yao

Abstract: This paper presents an analytical framework to develop a hierarchical home energy management system (HEMS). The smart home is dwell of a photovoltaic (PV) module, utility grid with dynamic electricity price, energy storage system (ESS), fuel cell (FC) and the appliances used in the household along with three different types of load characteristics (i.e., interruptible, uninterruptible and time-varying) is investigated. The nonlinear objective function is hard to solve; thus a piecewise linear function is applied to manage it. A home energy management system (HEMS) formulated using mixed integer linear programming (MILP) aims to decrease the electricity cost and the hydrogen cost for satisfying the scheduled load demands synchronously under a single optimization framework.

Analytical Study & Implementation of Web Performance Testing Tools

Divya Saharan, Yogesh Kumar and Dr. Rahul Rishi

Abstract: Software testing plays a key role in Software Development. There are two approaches to software testing i.e. Manual Testing and Automated Testing which are used to detect the faults. There are numbers of automated software testing tools for different purposes, but it is always a problem to select a software testing tool according to the needs. Web service is broadly utilized idea these days due to the quick promotion of Web services and less literature is accessible with respect to web administration's performance. Web applications are hard to test in contrast with customary applications particularly as far as Performance testing, for example, unpredictable load, response time and so on. In this investigation correlation of performances testing tools i.e. Apache JMeter, NeoLoad, and Loadster is done based on various parameters. Performance parameters results generated by these performance testing tools have been evaluated and assessed in terms of usability test parameters & performance parameters.

Vibration Signature Analysis for Broken Rotor bar Detection in an Induction Motor

Prashant Kumar and Ananda Shankar Hati

Abstract: Induction motors are workhorse of modern industries owing to its low cost and maintenance. Reliability of induction motor is an essential parameter for minimum downtime. Vibration analysis is widely used as an effective diagnostic technique for identifying electrical and mechanical faults. This

paper presents an effective vibration monitoring technique for detecting the severity of broken rotor bar fault. Results have been tested and validated in real-time with the help of fault simulator set up using LabVIEW interface.

Security in Opportunistic Sensor Network and IoT having Sensors using Light Weight Key Generation and Cryptographic Algorithm

Mohammed Salman Arafath, K.V.N. Sunitha and Khaleel Ur Rahman Khan

Abstract: Due to the vigorous constraint of resources in Opportunistic Sensor Network (OSN) and IoT having sensors and their applications in military and business raises demand to look out ways to secure the data in the sensors using cryptography. Cryptography is very ubiquitous in today's world; it is present in smart cards, your mobile phones and even in your Wi-Fi connection. Moreover not only programming language has some sort of support for encryption and decryption but this facility is also embedded in CPUs (ex-Intel AMD CPUs have support for AES encryption), sensors and smart cards. This paper is a successful attempt to use the existing AES for encryption and generating secret keys using lightweight key generation algorithm.

Performance Analysis of PV fed Boost Converter using a Linear and Non-linear Control Approach: PI and Sliding Mode Control

Nivedita Pati, Babita Panda and Bhagabat Panda

Abstract: This paper is focussed on behaviour of a PI and Voltage control Sliding Mode Controller (SMC) to enhance and regulate the output voltage of DC-DC Converter. A typical photovoltaic (PV) system consists of the solar generator, a power converter to regulate the variable dc, a power conditioning device and associated control circuitry. The paper intends to compare controllers of different architecture through Simulation based Model. Plant used for comparison is chosen to be a PV fed boost converter whose duty cycle is altered to achieve an enhanced and properly regulated output voltage. A detailed circuit model of the PV is formed and superiority of one controller over other is verified using the time domain performance parameters and sensitivity function analysis.

Line to Ground Faults Protection and Control method in Active Distribution Network using IEC 61850

A David Arulanandan

Abstract: Protection and control automation messages transfer between devices and the control center (CC) using IEC 61850 standard protocols in active distribution network (ADN) using Ethernet. Wireless communication network provides real-time monitoring and control of ADN. The proposed novel approach framework presents the protection and control method of line to ground (LG) faults at bay level through the IEC 61850 standard enabled intelligent protection devices for fast and reliable protection. However, this bay level peer to peer communication utilizes IEEE 802.11 wireless local area network (WLAN) to reduce the fault protection tripping time from the directional elements to the grid-connected protection devices by simultaneous multicast GOOSE communication services. End to end time delay and throughput of the coordination nodes are illustrated using NS2 simulation.

Power Loss Reduction & Enhancement of Power Transfer Capability with STATCOM & TCSC using Sensitivity Analysis

Md. Aftab Alam, Shobhan Banerjee, Krishnatreya Bhattacharya and C.K. Panigrahi

Abstract: Due to increasing load in the modern power systems, transmission and distribution of power is becoming problematic due to issues related to power flow, system stability, efficiency of transmission, etc. By controlling the parameters like line impedance, voltage magnitude and phase angle, the power flow can be optimized till a certain extent. For utilization of a power transmission network effectively, FACTS devices need to be placed in an optimal position. Static Synchronous Compensator (STATCOM) and Thyristor Controlled Series Compensator (TCSC) are devices when positioned in the suitable bus resulting in increased stability, increased load-ability and minimization of losses. An IEEE 5 bus system has been used to test for the optimal location of these devices and a comparative study has been done to determine the most efficient device. The comparative study is done with respect to the minimization of real power flows, total reactive power loss and total real power loss based upon sensitivity indices of the lines. The method has been described elaborately further.

Performance Analysis of Adaptive Filters based on Robust Second Order Generalized Integrator under Adverse Grid Condition

Banishree Misra and Byamakesh Nayak

Abstract: With increase in penetration of the distributed power generation systems into the grid, the grid voltage becomes highly distorted and unbalanced. In this situation designing a phase lock loop (PLL) is a challenge to estimate the phase, frequency and amplitude of the utility voltage. This paper presents a filtering technique based on adaptive filter called second order generalized integrator (SOGI). Under transient fault condition when the three phase grid signal is highly polluted with harmonics and sudden frequency change or voltage dip occurs, it is a critical task to extract the fundamental component of the grid signal. In this paper, for extraction of the fundamental component from the polluted grid signal, two adaptive filters using SOGI are implemented in the stationary reference frame. To analyse the disturbance rejection capability of the SOGI filter different short period disturbances has been introduced in the three phase grid signal and the robustness is evaluated on the basis of its transient response and harmonic analysis. The simulation result validates the excellent performance of the filter.

Performance Analysis of ALO Tuned FOPID Controller for AGC of A Three Area Power System

Geetanjali Dei, Subhadra Sahoo and Binod Kumar Sahu

Abstract: This paper proposes a new algorithm called Antlion optimizer algorithm (ALO) to solve the of automatic generation control (AGC) problem of an interconnected threearea system .The ALO is implemented to find the optimized values of the gains of the PID controller as well as FOPID controller in a three area interconnected system. ALO is applied to optimize ITAE index in time domain analysis .The simulation results show the efftiveness of the ALO optimized FOPID controllers in comparison to ALO optimized PID controllers. From the analysis It is shown that transient performance of ALO optimized FOPID controllers is superior than the ALO optimized PID controllers in terms of faster convergence. The settling time, maximum peak overshoot and maximum peak undershoot of the deviations in tie-line power and frequency are much better in ALO optimized

FOPID controllers as compared to the PID controllers. The dynamic response of the controller is analyzed by choosing 1% of step load change in load demand.

Performance Analysis of Three Phase Passive Harmonic Filters for HVDC Installations

Banishree Misra and Byamakesh Nayak

Abstract: This paper provides the harmonic mitigation scheme of a 12-pulse thyristor based high voltage DC (HVDC) system. The scheme considered here is a HVDC transmission system comprising only one terminal with a 12-pulse converter and a DC load of 1000MW. Because of the presence of the thyristor converter harmonics are injected into the system on the AC side. For compensation of the harmonics, shunt connected passive harmonic filters are connected on the AC side. Various shunt passive filters are selected on the basis of dominant harmonics present in the system and total reactive power demand for the compensation process. The effect of changing the firing angle on the active and reactive power generation and the total harmonic distortion of the source current and source voltage are analysed. The simulation results confirms the capability of current source converter (CSC) based HVDC converter operating with a wide range of firing angles. Then the performance of the thyristor based HVDC system is analyzed with passive filters and the results are validated for varying load condition in MATLAB/SIMULINK environment.

Symmetrical and Asymmetrical Conventional Cascaded Multilevel Inverter with SPWM Technique

Lipika Nanda and Dr. U. K. Rout

Abstract: Cascaded MLI (CHB) is the most popular MLI amongst the 'classical' topologies, partly owed to its modularity and partly for having fewer amount of switches than the other two for the same output generated. It is quite simple in construction. Simplicity and modularity makes it easier to manufacture and packaging too. The CHB is composed of an H-bridge cell and an autonomous dc source. The dc source could be capacitors, batteries or even photovoltaic cells, making it attractive for renewable energy systems. CHB generates a good sinusoidal output waveform with little total harmonic distortion. A major disadvantage of CHB is multiple DC sources.

Load Frequency Control of MSMA Hydro Thermal System using Tuned PI Controller

Anurekha Nayak and Manoj kumar Maharana

Abstract: Various load disturbances in the power grid highly influence the operation of the system. Due to a very high consumption of variable load, the frequency and power of the tie line deviate from their theoretical values result to serious instability to the unified power system. This article describes the LFC in a two-source two-area hydro thermal system. The above said control areas are connected by a tie-line. The system is first accomplished only with governor controller. Again the same power system is put through secondary PI controller. Furthermore the gain values of the proportional integral controller are tuned in MATLAB SIMULINK environment. With the proper tuning of proportional integral controller parameters, the anomalies found in the frequencies of the control areas as well as the tie line power are eliminated.

Grid Connected PV/Wind/Fuel Cell Hybrid Renewable Energy System using Droop Controller for Curtailment of Circulating Current

Debayani Mishra and Manoj Kumar Maharana

Abstract: In power industry due to fast industrialization the generation system has upswing towards strongly procuring energy from various non-conventional energy sources (RES). Persistent efforts are done in order to use additional energy from these renewable sources and limiting the dependence on the conventional energy sources. The amalgamation of various Hybrid Renewable Energy Sources (HRES) i.e Solar, Wind and Fuel cell in addition with load forms a Micro grid, the realistic management of energy from these renewable sources to accommodate energy demand on the load side with proper efficiency is necessary. Problems arising due to interconnection are instability in voltage and circulation of current within microgrid. Such problems have been addressed by stabilizing the voltage and accentuate the voltage that provides better performance to ensure proper load sharing. In this paper a small model of a dc microgrid consisting of renewable sources is designed and connected to a three phase grid is performed in the Simulink/Matlab environment.

Effect and Analysis of Unbalanced Voltage on Induction Motor Torque

Rudra Narayan Dash, Sangeeta Sahu and Chinmoy Kumar Panigrahi

Abstract: Induction motors has wide application in industries because of its rugged, easy operation and requires less maintenance characteristics. Besides the fact that they are reliable, they are exposed to different types of faults from which Unbalanced voltage supply is one such external fault. This fault can bring about issues like excessive warming due to huge amount of losses, over-voltages, mechanical scillations, audible noise and so on. Here, the impact of unbalanced voltage supply on the induction motor performance is studied. The analysis has been done to find the unbalanced voltage effect on the induction motor current and torque. For this, 16 different voltage unbalance cases have been picked with 8 different voltage unbalance type and 2 different voltage unbalance factor (VUF). Matlab Simulink is the tool used here for performing the experiment and its analysis.

Analysis and Implementation of a Novel Multilevel Inverter Structure using Reduced Power Electronic Switches and DC Sources

Rojalin Rout, Tapas Roy, Tanmoy Roy Choudhury, Byamakesh Nayak and Banishree Mishra

Abstract: A novel structure of multilevel inverter is presented in this paper. The presented topology is a cascaded structure of novel sub-module basic unit which can produce 19 level output voltage. The sub-module consists of 3 asymmetric dc sources (V, 3V, 0.5V) and 12 switches. It is capable of generating both integral and fractional output levels. The basic unit is connected symmetrically in a cascade manner. Proposed topology is compared with other MLI topologies that have been recently developed in terms of a number of switches, gate driver circuits, and dc links. It is observed that this topology uses less number of components at a given level among in comparison to other topologies. Simulation of the proposed basic unit is done in MATLAB/SIMULINK. The circuit is verified for different load conditions such as R-L, L and sudden load change conditions. Total Harmonic

Distortion of both output current and output voltage is also determined. This topology is found to generate output levels with very low Total Harmonic Distortion.

Development, Analysis and Simulation Study of a Novel Switched Capacitor Multilevel Inverter Structure for Different DC Source Configurations

Sitakant Debata, Tapas Roy, Silpashree Sahu, Thotakura NSC Sekhar and Abhijit Dasgupta

Abstract: This paper presents a novel switched capacitor multilevel inverter structure. The presented structure consists of a number of basic units in cascade configuration. The basic unit of the proposed structure has the capability of producing 29 output voltage levels using 15 numbers of power switches, 2 diodes, 2 capacitors and 2 dc sources. The capacitors act as alternative dc sources for producing the different voltage levels. One of the important features of proposed basic unit is that it has the inherent boosting capability and self-capacitor voltage balancing ability. After that cascaded multilevel inverter has been implemented by a number of proposed basic unit structure. Further, the cascaded structure is analyzed for symmetric and asymmetric dc source configurations. Comparison study is performed between the proposed inverter structures and recently developed switched capacitor multilevel inverters in order to showcase the different merits of proposed topology. The effectiveness of proposed structure has been verified by performing simulation study of a 29 level proposed inverter structure in MATLAB/SIMULINK for different load conditions such as R-L load, purely inductive load and sudden load change condition. Total harmonic distortion for output voltage as well as output current is found out to be very low in magnitude.

Modified Quadratic Boost Converter Adopting CLD Cell for High Voltage Gain useful in DC Distributed Generation

Tanmoy Roy Choudhury, Abhishek Singh, Subhendu Bikash Santra, Byamakesh Nayak and Arijit Karmahapatra

Abstract: In this paper, a Quadratic Boost Converter (QBC) derived high voltage gain converter is proposed. This converter is a combination of modified QBC (MQBC) with capacitor inductor diode (CLD) cell. The purpose of this CLD cell is to further enhance the voltage of MQBC whereas to reduce the switch voltage stress. The main feature of this converter is that it reduces the voltage stress of the switch compared to output voltage and independent of duty ratio. The principle of operation, steady state analysis and design of parameters are discussed in this paper. The analysis carried out in this paper is validated through Matlab Simulink platform for a 120 W capacity converter. The converter seems to be more efficient with increased output power.

Design and Analysis of a Quadratic Boost Derived High Step Up Converter for DC Micro-grid Application

Arijit Karmahapatra, Tanmoy Roy Choudhury, Byamakesh Nayak and Subhendu Bikash Santra

Abstract: This paper proposes a coupled inductor based quadratic boost converter with a switched capacitor cell to attain high voltage gain with low duty ratio. This converter is advantageous in two ways: higher voltage gain and reduced switch voltage stress. An analysis carried out to determine the steady state parameters with design of converter parameters. The theoretical analysis is validated through Matlab Simulink platform by designing a 250 W converter. Simulation results validated the effectiveness of the analysis.

Fast Charging a 12V Battery using Wireless Power Transfer Concept

Swagat Das and Sohan Chakraborty

Abstract: The main idea for this paper is to focus on two different concepts and try to abridge them. Firstly, we have shown how power can be transferred without wires using the concept of Electromagnetic Induction. In this method of power transfer, a high voltage of 230V AC is brought down to 12V AC. Then AC is converted to DC and then it is used to charge the battery. The distance between the two coils could be extended up to 3 cm. The second concept used in this paper is of fast charging. The AC output after transmission is passed through a fastcharging circuitry, which would focus on charging a load, say a 12V, 1.3 AH battery. Combining both these concepts, we reach a conclusion of fast charging through wireless power transfer. This could be a big jump in technology as it has various applications, starting from Electric Vehicles to biological implants such as pacemakers.

Mitigation of Power Quality issues in Grid-tied Hybrid Energy System using 3-Phase Shunt Active Filter

Rudranarayan Senapati, Byomakesh Dash and Rajendra Narayan Senapati

Abstract: This paper describes about mitigation of harmonic current component (one of the major power quality issue) as well as to recompense the imaginary or reactive power owing to their exact and reckless operation by the Shunt Active Power Filter (ShAPF) based on Sinusoidal Current Control Strategy in a grid integrated hybrid energy system of PV-Fuel Cell-Battery. The sinusoidal current control strategy is utilized to extricate sinusoidal current commencing from the source. The sinusoidal currents in addition with a burly synchronizing circuit (Phase Locked Loop or PLL circuit), custom a brief controller meant for ShAPF precise by a sinusoidal current control based controller to perform like a harmonic isolator amidst with supply and load. The performance of the said technique is evaluated using MATLAB R2016a under passive load (non-linear load). The simulation results validate the efficacy of the power filter system in harmonics mitigation. Total Harmonic Distortion (THD) of voltage and current determines the feasibility of the controller designed for ShAPF delivering a harmonic separation of passive loads in the grid tied hybrid energy system.

Performance Evaluation of Multilevel Inverter based Static Synchronous Series Compensator for Power Flow Control

Rudranarayan Senapati, Byomakesh Dash and Rajendra Narayan Senapati

Abstract- This paper consists of study of control logic of Five- Level Flying Capacitor Multilevel Inverter (FCMLI) based Static Synchronous Series Compensator (SSSC). SSSC is connected in series with the transmission line is preferred to other compensate voltage sag and swell. It also control the active and reactive power flow. It also helps in power frequency oscillation damping and also reduces the Sub-Synchronous Resonance (SSR). Besides this it helps in improving the Power factor by control of power angle. FCMLI is used in this paper to control the voltage injection. The control logic for the inverter has been presented in this paper. The control logic has been implemented in MATLAB/Simulink environment.

Performance Analysis of HvdC Lines using Surge Arrester

Aishwarya Sahoo, Madan Mohan Sahu, Shobha Agarwal and Abhijit Dagupta

Abstract: The paper shows a comparative harmonic analysis under fault with and without surge arrester at inverter side for (LCC) based (HVDC) system. Harmonic analysis has been done based on two conditions i.e. with surge arrester and without surge arrester. The voltage, current and threshold values are compared and analyzed for both conditions. The analysis is done using FFT analysis for better comparison results. The DC line connecting the two three phase sources have a length of 800 kms. The simulation results have been obtained using MATLAB -Simulink software.

A Review on Maximum Power Point Tracking for Solar Photovoltaic Power System

Bhabani Patnaik, Dr.Ullash Kumar Rout and Dr.Sarat chandra.Swain

Abstract: this paper provides a comprehensive review of the maximum power point tracking techniques of solar photovoltaic power system. After reviewing many papers I come to know that every technique has its own advantages and disadvantages. Also some technique is there which has more complex than other system and effect of cost is also a big role to select the MPPT technique for particular appliance like domestic, industrial etc., this paper give a quick access to the work done earlier in the field of MPPT.so that it can find the future scope of improvement in MPPT technique.

Robust Shared Control between Human and Automated Vehicle Subject to Nonlinear Tire Forces and Disturbances

Jagat J. Rath, Rudranarayan Senapati, Chouki Sentouh and Jean-Christophe Popieul

Abstract: Shared control between human driver and the automated vehicle system has been evaluated over typical driving scenarios such as lane keeping/ lane change assist, highway driving etc. Most of the proposed approaches are based on linearized vehicle driving models, integrated with driver models replicating torque based on visual cues. To account for nonlinear tire force variations, the Brush-tire force model has been considered in this work to develop the vehicle model. Further to account for conflict between human and automated system, a sharing parameter was introduced into the design of a robust sliding mode control approach. The proposed shared control approach was validated for constant

longitudinal speed under the influence of lateral wind force and road curvature as disturbance. Simulation results are also presented to show shared driving performance over Satory test track under variable driver under-load, over load and conflict scenarios employing the proposed controller.

Power Quality Assessment using Empirical-mode Decomposition with Hilbert Transform under Noisy Condition

S.K.Barik, J.Paramguru and P.K.Sahu

Abstract: The idea behind this paper is to establish a method combining both Empirical Mode Decomposition with Hilbert transform and de-noising technique for power quality assessment. Empirical Mode Decomposition separates the Intrinsic mode functions (IMFs) from the signal .the first three IMFs are used in the Hilbert transform technique for feature extraction. A noise is created in the original signal, after that S-transform technique is used for de-noising and to provide a

noise free signal. The different power quality events like voltage (sag, swell, sag with harmonic, swell with harmonics) has been created in MATLAB/SIMULINK.

Harmonics Mitigation of a Solar Photo Voltaic based Generating System using Shunt Active Power Filter

Sarita Samal and Sarita Samal

Abstract: The present paper proposes the mitigation of harmonics of a solar Photo Voltaic (PV) based generating system using Shunt Active Power Filter (SAPF). Power quality improvement is a major issue now a days and the quality of power is achieved by reducing the harmonic contents generated through the non-linear devices connected at the point of common coupling. However, SAPF is device which is mostly used for mitigation of harmonics at source current. In this present work a solar PV based generating system is design and simulated in MATLAB/SIMULINKR and a SAPF is used for harmonics mitigation. The results obtained are confirmed by using fast Fourier transform analysis considering with and without SAPF condition.

An Overview and Comparative Study of Boost, Quadratic Boost, Interleaved and Boost with CLD Cell Converters

Tanmoy Roy Choudhury, Byamakesh Nayak, Bhabani Sankar Dash, Aditi De, Ankita Roy

Abstract: In this paper, an overview of Boost, Quadratic Boost, Interleaved Boost and Boost with CLD cell has been presented. The overall comparisons with respect to their steady state parameters as well as the stresses on the switches are also being considered. Further a comparison of various parameter designs for the different converters are also included for better understanding. A Simulation model has been represented for each converter with 20/100 V step up capability for a 100 W system. The formulations are validated with Matlab Simulation.

Can Plastic Solar Cells be Alternative to Silicon Solar Cells?

Shubham Kumar, Alivarani Mohapatra and Byamakesh Nayak

Abstract: Solar cells for generating electricity from sunlight are conventionally made from silicon wafers, which can make them expensive. The prospects of replacing conventional silicon solar cells by plastic or polymer solar cells are promising as they could lower the cost of solar photovoltaic electricity generation besides other benefits like minimizing pollution hazards and ease of largescale production. Plastic solar cells possess additional advantages as they can be made available in the form of thin plastic sheets of different colors suitable for mounting on rooftops, windows, walls, vehicles, laptops, or other accessories to generate electricity. Plastic solar cells available today, however, have a short lifespan compared to silicon-based solar cells, as the polymers used today are susceptible to damage by heating and oxidation. The efficiency of solar photovoltaic conversion of these solar cells is lower than their silicon counterparts although the state of the art plastic solar cells has acquired comparable efficiencies. However, with the discovery of new polymers and modification of protection techniques, it is expected that these cells will provide the viable alternative to silicon-based solar cells.

Performance Analysis of Closed Loop Controlled Induction Motor Drive using Tandem Converter

Subrat Behera and Debashis Chatterjee

Abstract: This paper introduces a converter control scheme of induction motor drive which includes pulse width modulations for reducing switching losses. The converter named tandem converter has been applied to closed loop control of induction motor drive to improve efficiency. The THD analysis proves the better performance of induction motor compared to conventional VSI fed induction motor drive. This method uses pulse Amplitude modulation (PAM) for current source inverter (CSI) which works in tandem with voltage source inverter (VSI) to reduce switching losses. This method may be significant for improving DFIG performance in case of wind energy conversion system. The complete converter strategy is being verified by using MATLAB/SIMULINK

Dual-frequency GPS Derived Precipitable Water Vapor and Comparison with ERA-Interim Reanalysis Data Over Indian Stations

M. Ravi Kumar, Sampad Kumar Panda, D. Venkata Ratnam and Rudra Narayan Dash

Abstract—Apart from positioning, velocity and time transfer applications, the Global Position System (GPS) offers an exceptional opportunity for probing the space weather as well as atmospheric weather as the signals traverse various layers of earth's atmosphere. Following ionosphere delay, the troposphere delay is regarded as a non-negligible propagation threat to GPS and other navigation system performances. Present paper focuses on estimating Precipitable Water Vapour (PWV) which along with the dry gas pressure is responsible for total zenith tropospheric delay (ZTD) in GPS positioning. GPS observables at seven different locations in and around Indian subcontinent are processed through GAMIT that involves phase double difference positioning solution along through modeling of the delay parameters. With additional observed/modeled temperature and pressure parameters, the zenith hydrostatic delay (ZHD), zenith wet delay (ZWD), and PWV are estimated. The GPS- PWV is further validated with the ERA-Interim reanalysis data for investigating the disparity over the region. We noticed an acceptable agreement between the two at Bangalore (towards the equator) followed by underestimation at Hyderabad and overestimation at the farthest location Lucknow, through straddling across the average minimum values is perceived at KLU- Guntur location in India. The interpretation from the observations motivates further analysis of the GPS-based water vapor parameter at diverse locations involving the tropical wet and dry climate over Hyderabad and Guntur, semi-arid climatic conditions over Bangalore, and humid-subtropical climate over Lucknow. The outcomes of the paper would support lower atmospheric climatology as well as better mitigation of tropospheric delay errors ensuing relatively precise regional positioning services.

GPS Satellite Signals Derived Ionospheric TEC and Assessment of IRI-2016 and SPIM-2017 Model Predictions over Indian Region

R. Kanaka Durga, Sampad Kumar Panda and Rudra Narayan Dash

Abstract: Apart from the primary intention of positioning, navigation and timing applications, the global positioning system (GPS) has been popularized in providing the estimates of ionospheric total electron content (TEC) that is confirmed to be the reason for ionospheric error degrading the accuracy

of above applications. In the present study, we investigated the variation of GPS-TEC over the Indian low latitudes during the period 2012 to 2015 constituting midst of solar cycle-24. The results are further compared with the global ionosphere maps (GIMs), international reference ionosphere (IRI-2016) and standard plasmasphere-ionosphere model (SPIM-2017) to evaluate the model performances over the region. Observation during the typical geomagnetically quiet period (26-28 March 2013) demonstrates clear increase in TEC from equator to anomaly crest and declines thereafter towards higher latitudes. Seasonal comparisons confirm higher TEC magnitudes during equinox than the solstice seasons. Also, studies during geomagnetically disturbed period shows relatively poorer performances of the models during the episode of storms. In general, IRI-2016 model estimates seems to be manifesting closer values to the observed GPS-TEC; however with data ingested from IGS-GIMs into the SPIM-2017 model the estimations appears to be more realistic among all. Further improvements are suggested in the existing model for relatively better accuracy of TEC estimations and mitigation of ionospheric errors in communication and navigation signals over the low latitude Indian region.

An Innovative Fuzzy based Power Quality Assessment of Distorted Electrical Power System

Sanhita Mishra, Pampa Sinha and Dr.Sarat Chandra Swain

Abstract—Electrical power quality evaluation is highly important now a days as penetration of renewable energy into the grid and uses of non linear load are drastically increasing in the modern era. As there are different power quality indices which evaluates the power quality but it is highly essential to combine all the indices into a single value which can evaluates the power quality effectively. The innovative power quality index is found out considering the following component such as representative quality factor(RQPF), detailed pollution factor(DPF),total harmonic distortion(THD) and short circuit level(SCL).Fuzzy inference system has been implemented for doing the amalgamation of different power quality indices. In this paper THD module is formed by the amalgamation of total harmonic distortion voltage(THDV) and total harmonic distortion current(THDI) and THDSCL module is formed by the fusion of THD and SCL. The innovative power quality is formed by the mixture of THDSCL,DP and RQPF which has better significance both in quality and quantity point of view.

Optimal Power Flow Study using UPFC

Dr S.C Swain, Ramakanta Jena, Shaswat Chirantan and Dr.P.C.Panda

Abstract: The Controlled Reactive Power Gives the Desired Optimal flow of Power in the line. The FACTS devices effectively control the flow of Power in the lines. Improvement of voltage profile and minimization of losses are studied here with Optimal and non- Optimal Power Flow. The effectiveness and suitability of UPFC controllers are being discussed and is demonstrated through an Example and is clear that this device has the capability of regulating the flow of power, minimization of power losses.

Use of Feedforward Back-Propagation Neural Networks for Prediction of Energy Consumption by Appliances in an Energy Efficient House

Sushmita Das, Aleena Swetapadma and Chinmoy Panigrahi

Abstract – In this work a feed forward backpropagation neural network is proposed for predicting the energy consumed by appliances operated in an energy efficient house. The input data for the model is

collected from temperature and humidity sensors located in various locations in the house, weather data such as atmospheric pressure and wind speed from the nearest weather station and recorded data of energy consumed by the lighting units in the house. The algorithm used for training the network is Levenberg Marquardt algorithm. The output of the network was compared with the outputs of other statistical models namely Multiple linear regression, Support Vector Machine(SVM), Random Forest(RF) and Gradient Boosting Machine (GBM). The performances of the proposed model and the statistical models were compared on the basis of root mean square error (RMSE), mean absolute error (MAE), mean absolute percentage error (MAPE), coefficient of determination (R²).

Use of ANN in Energy Consumption Studies in Buildings: A Review

Sushmita Das, Aleena Swetapadma and Chinmoy Panigrahi

Abstract- Artificial Neural Networks provide an alternative approach to study of energy performance of buildings. Other methods available for energy analysis of buildings are simulation models using EnergyPlus, eQuest etc. and regression methods such Support Vector Machines, Classification and Regression Tree, Random Forest, Iteratively Reweighted Least Squares etc. The review suggests that Artificial Neural Networks are able to address the complexities and non-linearities present in data quite well and give superior results. In this work, a review of Artificial Neural Networks used in energy analysis studies of buildings is presented.

A Technique to Mitigate Inrush Current of Load Transformers using the Series Voltage Sag Compensator

Rudra Narayan Dash, K V V S R Chowdary and Satyaki Biswas

Abstract: Voltage sag is one of the most important reasons behind 92% of interruption that happens in industrial facilities. A series connected voltage source inverter coupled with transformer compensates the voltage sag in the most costeffective way. Another major effect of voltage sag is that a dc offset current occurs in flux linkage when the transformers installed in front of the critical loads are exposed to the disfigured voltage huge values of inrush current starts taking place and the flux linkage gets reached to the level of magnetic saturation as soon as the compensator starts restoring the load voltage. To protect itself from its overcurrent phenomenon the compensator is supposed to get interrupted. When this interruption happens, the compensation is bound to fail after some time and thereby causing the voltage sag to interrupt the critical loads. This paper aims at the voltage sag compensator to have a state feedback controller along with an inrush current mitigation strategy. Simulations have been provided in this paper in order to give proper validation to the approach that has been proposed and the operation principles have also been particularly selected and chosen.

Environmental Factors Affecting the Performance of Solar PV Cells: An Experimental Study

Satyaranjan Jena, Swagatika Sahoo and Sandeep Kumar Sahoo

Abstract: Now days the conventional generation system is not able full fill the exponential growth of electricity demand and more over, the conventional resources are diminishing at a faster rate. The use of renewable energy sources has increasing considerable to avoid environmental pollution and to congregate to future energy demand. Among all the renewable energy sources the use of solar energy is increasing rapidly due to its availability and advancement in Photovoltaic technology.

Environmental factors like temperature, irradiance, dust, shading, color spectrum, humidity, wind velocity, snow etc. are affecting the solar PV performance. In this paper effect of environmental factors on the output of solar panel and how they co-related to each other is analyzed by experimental work.

Transient Stability Analysis of a Two Machine Long Transmission System with Power System Stabilizer & Static Var Compensator

Shaswat Chirantan, Ramakanta Jena, Dr.S.C.Swain and Dr.P.C.Panda

Abstract: Power system stability dilemma demonstrates the effect of generator electro-mechanical oscillations & rotor angle swings on electrical grids. Power System Stabilizers (PSS) is an excitation controller used to damp out the generator electromechanical oscillations & rotor angle swings. But in severe faulted condition PSS cannot damp out the oscillations alone such as in case of a LLL-G fault. So in order to make the system stable by damping generator oscillations & rotor angle swings FACTS controllers (Flexible AC Transmission System) along with PSS are used cumulatively in power system. In this paper, transient stability studies of a two machine long transmission system with PSS (both generic & multi-band type) & SVC (Static Var Compensator) a shunt based FACTS controller for L-G fault & LLL-G fault have been investigated. All the performance analysis have been undergone using MATLAB simulation.

Steady State Power Flow Analysis using SSSC

Ramakanta Jena, Shaswat Chirantan, Dr.P.C.Panda and Dr.S.C Swain

Abstract- SSSC is a series compensator for compensating both active and reactive power. It also damps system oscillation in transient mode. In SSSC there is a energy source in dc link which supply and absorbs reactive power to and from the transmission line. Here a Multi machine system is taken into consideration for achieving the desired flow of power in the transmission line.

Review of Wind Power Conversion Methods

Thotakura NSC Sekhar, Udayan Banerjee and Tapas Kumar Saha

Abstract: The ever-growing demand on electrical energy is keeping the researchers in a continuous quest for developing new yet clean methods of power generation methods. Wind energy is one of the fastest growing renewable energy resources. It has been coming across changes continuously at frequent intervals beginning from the squirrel cage induction generators to present state of art multi-polar permanent magnet synchronous generators. This paper presents the technological developments in wind power conversion methods to extract electricity from wind turbines along with their active, reactive power sharing capabilities, fault ride through capabilities and other challenges. It also compiles the detailed requirement of direct drive mechanism irrespective of their high cost and larger size.

The Current Signal Analysis for the arc stability in Tandem Gas Metal Arc Welding (T-GMAW) using Continuous Wavelet Transform

Mrityunjay Kumar, Thotakura NSC Sekhar and Bishwaindu Chakraborty

Abstract: The signal analysis using wavelet transform is a very good technique to analyse a signal. In this article the electric current signal analysis of the Tandem Gas Metal Arc welding has been done.

This paper is focused upon the in-time arc stability analysis during tandem Gas Metal Arc Welding. The wavelet transforms of the current and signals gives us an idea about the metal transfer condition. By transformation of the signal using continuous wavelet transform as a tool we can convert the signal into a Time-Frequency-Magnitude chart and thus the process fault of welding can be detected with accurate time prediction. This technique can further help us in an automatic detection of the welding process and thus it will be helpful for weld-process enhancement.

Load Frequency Control for Hydro-Thermal System using Hybrid Gravitational Firefly Algorithm

Deepak Kumar Gupta and Ankit Kumar Soni

Abstract--This paper presents the load frequency control of two area power system comprises of one hydro plant and one thermal power plant. Hybrid gravitational search with firefly algorithm has been developed for the Tuning of proportional plus integral controller's parameters. Integral time multiplied by absolute error (ITAE) performance indices has been used as the objective function for the optimal value of controller's parameters. Mismatch in power generation to the total load plus system losses may result in variation in frequency and tie-line power flow from the desired limits. System performance is examined considering perturbation step load change in hydrothermal system. Simulation studies and a comparison of dynamic responses reveal the performance of the hybrid gravitational search firefly algorithm for the optimal tuning of PI controllers in terms of the frequency deviation and Tie-line power responses in both the areas.

Impact of Capacitor Allocation and Phase Balancing in Unbalanced Radial Distribution Systems

Padarbinda Samal, Tapas Roy and Thotakua NSC Sekhar

Abstract: This paper investigates the impact of simultaneous capacitor allocation and phase balancing in a practical Indian distribution systems. Firefly algorithm (FFA) algorithm is implemented to obtain the optimal capacitor location and phase balancing. Four objective functions are considered in this work. They are the minimization of (i) total system real power loss, (ii) average voltage drop, (iii) total neutral current, and (iv) total negative-sequence voltage unbalance. These objectives are minimized while satisfying the voltage limit of buses and thermal limit of each line. An unbalanced load flow algorithm based on forward- backward sweep is employed as an auxiliary tool for the evaluation of these objective functions. The simulation results obtained with the Indian 19-bus unbalanced radial distribution networks show that significant improvement in real power loss, average voltage drop, and total neutral current can be achieved with simultaneous optimization for capacitor location, sizing and phase balancing.

Current Control using Artificial Neural Network for SPV Grid Connected System

Dr. Sarat Chandra Swain, Akash Adak, Sayan Chatterjee, Ritesh Dash and Shalini Biswas

Abstract: This paper introduces another strong innovation for current control system in view of Artificial Neural system (ANN). Advancement of sustainable power source intently take after with vulnerability. Execution of state space vector balance can improve the execution of inverter for network interconnection. This paper demonstrates the execution of SPWM technique for under

regulation and over regulation for duty cycle of static switch. Singular preparing technique have been embraced for preparing of every hub of the neural system. MATLAB based Simulink strategy has been received to approve the rationale and design. ANN instrument base has been embraced for preparing reason.

Performance Analysis of CCT through FRC & ANFIS for Grid Connected SPV System

Dr. Sarat Chandra Swain, Shreya Nandy, Shreya Mukherjee, Ritesh Dash and Souvik Nayak

Abstract: Inexhaustible grid interfacing framework is being elevated generally with a specific end goal to safe watch the utilization of ordinary sources of Energy. Grid interconnection of high end inexhaustible sources with that of the grid causes unsettling influences and prompts the perpetual shutdown of the inverter. Customary controller, for example, linear controller and non-linear controller perform well under adjusted state of activity however this controller ends up slow amid grid unsettling influences. Controller in view of AI Techniques has been created in this way to deal with make the controller stable amid adjusted and un-adjusted state of activity. MatLab Simulink based framework has been created for checking the legitimacy of the proposed controller.

Performance Evaluation of a Grid Connected Photovoltaic System based On Solar Cell Modelling:-Part-III

Sanhita Mishra, Ritesh Dash, Dr. Sarat Chandra Swain and Debasish Pattnaik

Abstract: Solar photovoltaic energy is increasing throughout the world and it is because of its cleanness and easy availability. The fluctuated output of the solar photovoltaic makes it restrict to be grid connected. This rapid fluctuation sometimes leads to voltage dip, sag and other issues related to power quality. So these problems puts a limit in the interconnection. Detailed mathematical modelling and equations are presented here in order to analyze the transient effect of the system under normal as well as fault condition. Grid synchronization issue is addressed in this paper. This paper presents a simulated solar PV grid interconnected system. The objective of this simulation is to find out the point where the PV system is to be connected so that maximum power can be transferred without affecting the performance and stability of the system.

Multiloop Current Control Techniques for Grid Connected PV System with LCL Filter

Bachaknabi Pal, P. K. Sahu, S.R. Jena, Srikanta Mohapatra and S. K. Barik

Abstract: The different feedback current control techniques of the grid connected PV system systems with LCL filter are presented in this paper. The different possible dual-loop feedback current control techniques for a grid connected inverter and their performance have been discussed here. The performance study is accomplished from different perspectives like rejection of disturbance in grid voltage and the stability condition when the PV system undergoes different surrounding conditions. Classic PI controllers have been used in all case of control strategies and the inverter is operated in voltage control mode. In order to eliminate high switching harmonics, an LCL low pass filter is used in between the PV inverter and grid. There are two multi-loop current control strategies are discussed here and the prime focus in this paper is on the design of each control method and find out the most suitable control method by making a brief comparative analysis among them. The current control

methods are then applied to 1-KVA, 110V, 50Hz single-phase grid-connected inverter system. The inverter output impedance is considered here for their performance evaluation.

Harmonics Mitigation of a Solar Photo Voltaic based Generating System using Shunt Active Power Filter

Sarita Samal, Sandeep Kumar Sahu and Prasanta Kumar Barik

Abstract: The present paper proposes the mitigation of harmonics of a solar Photo Voltaic (PV) based generating system using Shunt Active Power Filter (SAPF). Power quality improvement is a major issue now a days and the quality of power is achieved by reducing the harmonic contents generated through the non-linear devices connected at the point of common coupling. However, SAPF is device which is mostly used for mitigation of harmonics at source current. In this present work a solar PV based generating system is design and simulated in MATLAB/SIMULINKR and a SAPF is used for harmonics mitigation. The results obtained are confirmed by using fast Fourier transform analysis considering with and without SAPF condition.

Maximum Utilisation of Solar Energy for Smart Home Lighting System

Aditya Mukherjee, Nirmalya Roy, Aditya Kumar, Chandra Prakash, Sanskriti and Nirmal Kumar Rout

Abstract: In modern world there is burgeoning demand for energy to power every piece of technology. Due to this, the non-renewable energy resources are reaching the point of depletion sooner than expected. Thus, researchers around the globe are searching for an alternative of fossil fuel and trying to find a sustaining energy source. There has been many recent development and innovation in the field of solar energy utilization. In this paper, a method has been proposed for the maximum utilization of solar energy for home lighting applications. Firstly, sun tracking solar panels are to be used for harnessing as much solar energy as possible. This assures the maximum solar power gets stored in the Photovoltaic (PV) cell. The PV cell gives DC output which can be stored in a battery, preferably lithium polymer battery and can be used to power home lighting appliances. The rest can be stored in solar UPS for future usage or power other AC appliances. Furthermore, the solar UPS helps convert the house from hybrid to off-grid solar system. Finally, the charge stored in DC battery are used to vary intensity and color of RGB LEDs. The rooms can be illuminated as required by the user. These series of methods or control systems helps to conserve and maximize the utilization of solar energy.

Design and Performance Analysis of Memats in Vertical Transportation System

Devarakonda Chakradhar, Animesh Anand, Suvhojit Das, Suvendu Panigrahy, Thupakula Mahesh and Nirmal Kumar Rout

Abstract: in modern day to day life elevators and lifts are used everywhere. The vertical transportation system is used to transport people and goods from one storey to another in multi-storey buildings such as offices, malls, residential buildings etc. Vertical transportation system works in two modes, one is the running mode when the lift/elevator is working and consuming energy and the other is standby mode. In standby mode, the system is not working but it is consuming energy as it requires a continuous power supply to make it run. There have been much technological advancement to make energy efficient vertical transportation systems but there is no such advancement to reduce or to avoid

standby mode energy consumption. This paper presents an energy-efficient way to neglect the standby mode energy consumption issues by designing a weight sensing mat called Memats (mechanical mats). The Memats is a mechanical mat which acts as a switch. When weight acts on it, it becomes short circuit and when no weight acts it acts as an open circuit. These mats are integrated with the vertical transportation system to save energy. On integrating the Memats in lift/elevators and escalators a huge amount of energy is saved which is being wasted in the standby mode.

Improvement in Switching Strategy for Grid Connected Pulse Width Modulated Voltage Source Inverter

Satyaranjan Jena, Sandeep Kumar Sahoo and Pradipta Kumar Sahu

Abstract: The paper provides a comparative analysis of the single band hysteresis current controller and double band hysteresis current controller for a single phase grid connected pulse width modulated VSI. Disadvantages of the HCC like incapability of using zero output state and bipolar nature of output voltage can be overcome by using double band hysteresis current controller. The output of double band controller (DBC) switches between +VDC and zero or -VDC and zero voltage levels resulting in unipolar nature output voltage which is better than the bipolar one in terms of the harmonic content and output current ripple. It also achieves the zero state output voltage and the switching frequency is also reduces in case of DBC. The studied system is modeled and MATLAB/Simulink environment.

Verifying Identical Twins Identity using Curves of Their Palatal Patterns

Kamta Nath Mishra

Abstract: The study and analysis of palatal patterns for identifying an individual is termed as palatoscopy or palatal rugoscopy. Since, fraternal twins (also called dizygotic twins) are generated from two different eggs at the time of fertilization. Therefore, the fraternal twins differ from each other in their face structure and gait signature etc. But, the identical twins are generated from the same egg. Hence they share the same DNA sequence and same face structure.

It is difficult to identify identical twins (monozygotic twins) on the basis of their face structure or DNA sequence or gait signature. But, they can be differentiated / identified on the basis of their palatal rugae patterns. This research paper presents a mathematical model for identifying identical twins on the basis of the structure of their palatal patterns. The palatal curves of identical twins are represented by unique symbols and curve tracing based approach is used for comparing the palatal patterns of two different pairs of identical twins in the proposed mathematical model. The author has used self generated data set of five pairs of identical twins palatal patterns for developing the proposed mathematical model where ten images of each person of identical twin pair were taken into considerations. The experiments and the corresponding results reveal that the proposed mathematical model of palatal curves based identification of identical twins is clearly able to identify the identical twins with high accuracy (above 90%).

A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier

Bethanne J. Janney, S. Emalda Roslin and Shelly Mary Jo

Abstract: Skin cancer cases have grown worldwide, and it is by far the most common of all cancers. It is caused by the extended exposure to harmful radiations from the sun. Skin cancer can be broadly

classified into two categories as melanocytic and non-melanocytic (benign). Most basic way to detect the threat of skin is by visual investigation performed by a specialist dermatologist employing a set of specific clinical tools. This paper describes novel image processing approaches for skin cancer detection using dermoscopy images. The motive of this work is to investigate and prefer an algorithm for skin cancer determination that can group the lesions as malignant or benign melanoma in terms of accuracy, sensitivity and specificity. Initially, the image samples showing melanoma are obtained by using dermoscope and segmented. It is then given for feature extraction and the results are classified using Support Vector Machine (SVM), Artificial Neural Network (ANN) and Naive Bayes Classifiers.

Performance Evaluation of various Temporal Derivatives for Stabilization of Videos with Large Moving Objects

Paresh Rawat and Jyoti Singhai

Abstract: The efficiency of the various video stabilization methods depends on the efficiency of the motion estimation stage. Various Temporal derivatives are designed to efficiently estimate the inter-frame motion or optical flow for video stabilization. The performance of the video stabilization methods degrades under the presence of large moving objects in the scene. Therefore, this paper compares the performance of video stabilization method by estimating the motion using the various temporal derivatives. The video stabilization method in this paper uses differential Taylor series expansion based motion estimation followed by IIR filter for smoothing the motion. A 2D-affine parametric model is used for motion estimation. For performance evaluation the MSE and temporal derivatives in X and Y directions using different derivative operators are compared. It is found that the four point temporal derivative gives the minimum inter-frame error under large object in scene.

Assessment of Pollution-Induced Flashover of 11kV Porcelain Disc Insulators in Artificial Fog Chamber

Ilyasali Ashakali and Prof. M.F.A.R. Satarkar

Abstract: The high voltage insulators are key components of electrical power transmission network. These insulators get contaminated by a number of pollutants in the atmosphere which leads to flashovers in moist condition. This paper represents the artificial pollution tests conducted on 11kV T&C type porcelain disc insulators in an Artificial Fog Chamber. The contaminants have been selected based on their solubility and availability at various geographical regions. Wet flashover voltages have been determined for each contaminant with different concentrations and the assessment of flashover characteristics has been done with respect to different parameters i.e. Solubility, Relative Humidity, pH, ESDD and Conductivity.

RAW IMAGE: A Transformation and QOII Analysis

Murugesh K and Mahesh P K

Abstract: RAW - Image processing is significant to ignore the duplication of data, to economize the space needed, ease image/ file operations and to have an uninterrupted capturing. RAW is digital negative contains the camera captured image data regarding the sensor pixels values and text information. The Image quality is the substantial parametric quantity which determines the visual of the captured RAW. The RAW is being highlighted as digital negative and varies with the formats, depends on hardware manufacturer. The proposed workflow is to extract the contents of RAW sensor information from the RAW files and processing and displaying the information in image format. The

most extreme resolution with no inbuilt compression (RAW) results in high image from any digital camera. The MATLAB R2016a has been used for executing the workflow and analysis purpose. The display quality is ensured by the performance parametric metric- Quality of Image Improvement (QOII) and also the file size reduction ratio was analyzed. The RAW test files were gathered from cameras by different manufactures. The proposed workflow yields good reduction ratio for all the test images. The Image quality improvement metrics yields 85% percentage of results.

Control of a PV integrated multilevel Inverter Fed with Matrix Converter

Gayatri Mohapatra and Asim Kumar Dey

Abstract: Multilevel inverter (MLI) used in VSI has acquired wide utilization in industries. They are used, in order to obtain higher output voltage with lower frequencies of switching. MLIs are known for less THD with increased number of level. The matrix converter is used for ac to ac converter for variable frequency drives, basically giving a good power factor improvement. This paper aims in developing simulation model of the matrix converter, established in Matlab Simulink with proper modulation technique. This also deals in controlling a PV integrated three phase CHB inverter, loaded with matrix converter using the PR (Proportional Resonant) controller for control.

Parametric Representations of Automatic Birdcall Recognition Systems using the Gaussian Mixture model

Mrs. Ricky Mohanty, Dr. Bandi Kumar Mallik and Dr. Sandeep Singh Solanki

Abstract: The major goal of this work is to analyze the sound waves produced by multiple species of birds using spectrogram features, which is present in an audio recording. This data helps in to give program examination and remote checking of the entire populace and species of birds. This can help the pertinent offices with data for natural preservation of these species. This includes survival plans and actions can be studied. The sounds produced by these birds have special acoustic features which could help us in detecting the type of birds. In this paper, we are going to study a technique which will help in finding the type of birds using the wavelet features which are extracted using the Mel Frequency Cepstral Coefficients (MFCC). The classification of the features is done using the Gaussian Mixture Model (GMM).

Effect of Transition Metal Doped ZnO Coated on Al Working Electrode for K⁺ Ion Sensor

Usharani panda, Arun K. Das, Farida A. Ali, Priyabrata Pattanaik, Sushant K. Kamilla and Dilip K. Mishra

Abstract: Ni doped ZnO has been widely studied as a diluted magnetic semiconductor (DMS), but in this work we have shown its use as a biosensor. Now-a-days, electrochemical biosensors provide an attractive and affordable path to analyze biological samples by converting biological events directly to an electrical output. Alkali metal ions play a vital role in biological events and study of which is necessary to know the healthy functioning of human body organs. Potassium ion (K⁺) is one of the alkali metal ion in blood which needs regular monitoring. This motivated us to go for synthesis of ZnO and Ni doped ZnO by sol-gel method and later working electrodes were fabricated by coating the synthesized materials on Al substrate by Chemically Wet and Dry (CWD) method indigenously developed in our lab. The fabrication process was followed by insitu annealing of the sample electrodes at 4500 C in presence of Nitrogen environment. The crystalline property of the synthesized

materials was confirmed by XRD study. The Hall Effect study shows higher mobility and conductivity values for Ni doped ZnO in comparison to pure ZnO. The performance and response to various concentrations of KOH solution and PH level were experimentally studied by both electrodes separately considering Ag as reference electrode. The sensitivity of Ni doped ZnO coated Al electrode was found to be stable and longer sustainable than that of ZnO coated Al electrode in terms of potassium sensing.

Perovskite Quantum dots Embedded in PMMA Matrix for Resistive Switching Device

Rajeev Ray and Suman Kalyan Pal

Abstract: In this work, we have fabricated $\text{CH}_3\text{NH}_3\text{PbBr}_3$ perovskite quantum dots embedded in PMMA matrix-based memory device. Resistive switching phenomenon was detected in this perovskite quantum dots and polymer composite. The ON/OFF current ratio was measured to be larger than 102 as well as good reproducibility and reliability. Our research paves a way to utilize organolead halide perovskite quantum dots for nonvolatile memory applications.

Tunable Defect Mode in A 1D Plasma Photonic Crystal

Ranjita Panda, Suneet Awasthi, R.C. Singh and C. K. Panigrahi

Abstract: By using the transfer matrix method, theoretical investigations have been carried out in the microwave region to study the defect mode properties of a magnetized cold plasma photonic crystal with a semiconductor defect. The proposed structure is investigated for finite number of periods (N). A semiconductor layer is sandwiched by a finite number of period of alternating layer of plasma and a μ negative material. The transmission properties are investigated thoroughly which revealed that the defect mode due to the introduction of semiconductor material is very sensitive to externally applied magnetic field and can be applicable for designing tunable magneto-optical devices, omnidirectional total reflectors and single channel filter with high intensity.

Reconfigurable Unequally Spaced Linear Arrays through Time-Modulation

S. Patra, S.K.Mandal, G.K.Mahanti and N.Pathak

Abstract: In this paper, a novel approach to synthesize sum and difference pattern through time-modulation in unequally spaced linear arrays with uniform amplitude excitation is presented. Both the patterns are obtained with same element position whereas the two patterns differ only in switch on-time sequence of the RF switches connected to the antenna elements. Differential Evolution (DE) is used to obtain the optimized element position, and on-time sequence of the antenna elements. The effectiveness of the proposed approach is presented with the numerical results of a 20 element linear array.

DCT-based Blind Watermarking Technique for ECG Signals

Fatma K Tabash and M. Izharuddin

Abstract: Nowadays, there is an increasing orientation toward treatment with telemedicine. Therefore, the hiding of the information of patients from the third side becomes mandatory. At this study, we

present a new robust watermarking technique that embeds the information of patients inside the ECG signals. Recently, the most of recent watermarking techniques on ECG signals consider ECG signals as multimedia signals. They did not consider either the distinct nature of ECG signals or the multiple signals processing attacks that it may impose like baseline wander filtering, powerline noise filtering and EMG noise filtering. The proposed technique consists mainly from three stages; first one is the encryption of the watermark stream using chaotic numbers to achieve more security. Second one is the process of selecting the powerful frequency ranges from the signal bandwidth where they can hold the watermark efficiently and maintain more robust under different types of signal processing attacks. Thirdly, the watermark is inserted into ECG signal using insertion process in Discrete Cosine Transform (DCT). The experimental results shows that the proposed algorithms achieve all the requirements of watermarking in addition to it maintains robust under different types of attack.

Estimation of Sea Surface Parameters using GNSS Reflected Signals

B.Deekshith and B.Leela kumara

Abstract: Sea surface parameters play important role in both in ship navigation and communications. To remote sense sea surface parameters such as roughness, wind speed it is proposed to use GNSS reflected signals. To achieve this aim, initially, the characteristics of GNSS, Ocean Surface, and the principle of operation of bistatic scattering system will be understood using the information available in open literature. Bistatic scattering system consists of Transmitter and Receiver and Ocean environment. Based on the new emerging techniques, an algorithm for estimation of the sea surface parameters will be developed and validated with experimental data. From the literature survey a new wave propagator that can be used to simulate the Global Navigation Satellite System reflected signals from the Ocean surface can be realized. The GNSS reflections are dependent on Ocean characteristics. Simulate the surface reflections will gives the spectra of the reflection waves and are compared with measured GPS surface reflections. The measurements will be performed using IRNSS receiver. Both simulated surface reflection signals and direct signals will in general reveal spectral structures of the reflected signals. By analyzing these signals the sea surface parameters will be extracted.

Probabilistic Study of Software Defects Underlying Relation between Pre-Release and Post-Release Defects

Dheeraj and Dr. Chhavi Rana

Abstract-Components that have defects after release, but not during testing, are very undesirable as they point to 'holes' in the testing process. In this work, the main objective is to provide a relation between pre-release & post-release defects. This work describes the initial effort of building analysis for defects in system testing carried out by an independent testing team. The motivation to have such correlation analysis in software defects is to serve as an early quality indicator of the software entering system testing and assist the testing team to manage and control test execution activities. Dataset is analysed with curve fitting methods & then sets are validated using correlation methods. After this, different performance parameters are calculated using probabilistic analysis tools.

Seawater Absorption and Mechanical Properties Evaluation of Polymer Matrix Hybrid Composite

Ramesh Kumar Nayak and Smaranika Nayak

Abstract: Fibrous reinforced polymer composites are used in automobiles, aerospace, railway, marines, construction, and mega structures like airport infrastructure and Olympics. Carbon fiber

reinforced polymer composites (CRPC) are stronger than glass fiber reinforced polymer composites (GRPC). However, the cost of carbon fiber is around four times than glass fiber. Therefore, there is a need to evaluate the mechanical properties of glass/carbon hybrid composites in both dry and wet conditions to meet the design requirements and reduce the cost. In this article, the effect of glass/carbon fiber ply sequence on mechanical properties was investigated experimentally. A hybrid composite ([G3C2]S) was fabricated and its mechanical properties were evaluated and compared with GRPC and CRPC in both dry and seawater aged conditions. The results revealed that tensile strength and tensile modulus of hybrid composite [G3C2]S were increased by 7.62% and 11.3% in dry condition and 7.45% and 27.1% after seawater aging treatment respectively as compared to pure glass fiber reinforced polymer composite. Flexural strength and the flexural modulus of hybrid composite [G3C2]S have increased by 18.8% and 29.35% in dry condition and 34.2% and 24.61% after seawater aging treatment respectively as compared to GRPC. The toughness of hybrid composite [G3C2]S is significantly higher by 120.52 % in dry and 175.2% after seawater aging treatment as compared to CRPC.

Wide Area Situational Awareness Enhancement using PMUs

Mahendra Meher, Cherukuri Murthy, Kunja Bihari Swain and D K Mohanta

Abstract: Currently, the Indian power system is expanding to a larger power network. In order to monitor such a huge network, wide area measurement system (WAMS) is essential. Phasor Measurement Units (PMUs) is the edifice of WAMS and they play a vital role in enhancing the situational awareness of the power system. However they cannot be placed at all the buses as it is not economical. In order to overcome this, an optimal technique using Bat algorithm has been proposed to make the power system completely observable. The technique has been validated on the IEEE 9 bus, IEEE 14 bus, IEEE 30 bus, IEEE 39 bus and IEEE 57 bus.

Cross Subsidy Reduction from Electricity Tariff while Making Distribution Company a Profit Gaining Entity

Varada J. Tambe and S. K. Joshi

Abstract: The Indian Industrial and Commercial consumers pay higher prices for electricity consumption in comparison to the actual Cost of Supply due to Cross Subsidy component incorporated in their tariff. This paper proposes an optimization model to reduce the cross subsidy component. It is achieved by filling the gap between expenditure & revenue collected by Distribution Company by imposing an additional charge called as Universal Charge for a certain time period on every consumer category under the constrained tariff environment. The model is designed to be consumer as well as Distribution Company oriented as along with reduction in cross subsidy, the Distribution Company gains considerable profit.

Adaptive Noise Cancellation from Color Images using a Novel T-S Fuzzy System for Noise Detection

Anita Sahoo

Abstract: In the paper, a novel first order Takegi-Sugeno fuzzy system is proposed for efficient impulse noise reduction from color images. Inputs to the fuzzy system are determined by employing morphological operations on the corrupted image. Output of the system is a noise flag that is computed for each pixel in the image.. The noise flag corresponding to a pixel shows how much noisy a pixel is.

Finally, an adaptive weighted linear filter is used for noise cancellation that uses these flags as weights. Experimental results indicate that the proposed scheme is capable of suppressing impulse noise effectively in color images. The fuzzy detection of noise and the adaptive nature of the weighted filter together optimize the restoration capability of the proposed filter.

Fault Analysis on Transmission Lines using Phasor Measurement Units: a Brief Review

Shakila Begum M. Nisar, Murthy Cherukuri, Kunja Bihari Swain and D K Mohanta

Abstract: Phasor Measurement Units (PMUs) are the measuring devices that can capture the voltage and current phasors on the power system. The phasors are time tagged by using global positioning system (GPS). Synchronized phasor measurements obtained from PMUs are used for the purpose of monitoring and control actions for wide area measurement system (WAMS). PMUs are the heart of WAMS. Several researchers have exploited the use of PMUs for many diverse applications. This paper specifically presents a brief review of PMUs used in detection, classification and localization of faults in transmission lines.

Hiding a Color Image in a Scrambled Image

Himani Sharma, R K Sharma and Naveen Kumar

Abstract: Steganography is the art of concealing the presence of data to prevent it from any scrutiny. In this paper, we have used an approach that first scrambles the cover image pixels to a specific number of iterations of Arnold transform. The proposed approach then applies steganography varyingly to RGB components of the cover image, to hide the compressed frequencydomain RGB image data obtained by applying Discrete Wavelet Transform (DWT). The image is then converted back into original pixel locations to travel through the insecure network. Thus even if data is extracted from the cover image, it appears as noise to the attacker. Further, DWT converts data into decomposed wavelet coefficients. These coefficients are then compressed and merged into dislocated cover image pixels, enhancing the security of important image information manifolds. Steganography analysis demonstrates its effect on different RGB components of a cover image. Experimental results and statistical analysis show high imperceptibility and embedding rate of the technique used.

An Advanced Procedure for the Analysis and Detection of Dermatitis Disease using Image Segmentation Methods

Prafulla N. Aerkewar and Dr. G. H. Agrawal

Abstract: The aim to publish this research paper to classify dermatitis disease using new an advanced technique of image segmentation called k-means clustering method. The process of clustering image segmentation method extract different features of input test image of dermatitis disease and compare with database images features values. This method suggest appropriate procedure such that the all dermatitis disease having skin lesion on body are classified in to four category using k-means image segmentation and nntool of Matlab. Using the image segmentation technique and nntool can be analyze and study the segmentation properties of skin lesions occurs in dermatitis disease. A skin lesion is a superficial growth or patch of the skin that does not resemble the area surrounding it. It have also been proposed that which are suitable for the processing of various images for different types of patches for various skin diseases. The skin lesion in different dermatitis diseases are different in appearance and have different properties though they looks similar in some circumstances. The main

objective to classify the lesions of different dermatitis diseases based on its twelve parameters like contrast, Energy, Homogeneity etc where it would be able to classify the similar patch in to different disease.

A Brief review on Structural, Electrical and Magnetic Characterization of Bismuth Ferrites

Soumya G Nair, Dhanya S R and Jyotirmayee Satapathy

Abstract: Bismuth Ferrites (BFO) nanomaterials are one of the promising materials to provide applications in the electrical world for its unique multiferroic properties. The evolution in its research from the pure form to doping and co-doping has shown the mankind the diversity of its properties and subsequent useful applications. The peculiarities of ferroelectric and ferromagnetic properties as observed in these multiferroics are the result of the structural perturbations which is due to doping and different synthesis mechanism. A consolidation of the noteworthy changes reported in the electrical and magnetic properties of BFO so far are reviewed here in brief.

Low Complexity FBMC Scheme based on Symbol Cyclic Shift Equalization

L Naga Venakata Durga Lakshman Rao and Smt.A.Rajani

Abstract: Inter-symbol interference can be reduced by using a cyclic prefix in time dispersive OFDM systems. The usage of cyclic prefix can reduce the bit error rate to get more system performance, when the bit error rate of the system is less. But the data capacity of the system depended on the cyclic prefix length. The data rate can be increased by reducing the length of the CP. If we reduce the cyclic prefix then there is more chance of BER. A novel structure consisting of filter banks using QAM/PSK system to increase the data rate as well as to reduce the bit error rate. By using FBMC we use multi-carriers so that the bit error rate can be improved. This data rate and bit error rate results can be compared with PAM OFDM system. The proposed method gives an efficient result than the traditional OFDM system and it increases the efficiency of the system.

Implementation of Low Power Carry Skip Adder using Reversible Logic Gates

Addanki Purna Ramesh

Abstract: Addition is a fundamental arithmetic operation and is the base of many other commonly used arithmetic operations such as subtraction, multiplication and division. Adder or summer is a digital circuit that performs addition of numbers. The 1-bit full adder is the building block of an arithmetic unit of a system. There are several adder designs implemented so far to reduce the power. However, each design suffers from specific disadvantage. Reversibility is the prominent technology in the recent era. In reversible logic the number output lines are equal to the number of input lines. In reversible logic the inputs are to be retrieved from the outputs. Reversible logic gates are user defined gates. Reversible logic owns its applications in various fields which include low power VLSI. In this paper Carry Skip Adder (CSKA) is implemented in two different designs i.e. design-I and design-II. Design-I is implemented using Peres reversible logic gates with irreversible (XOR, AND, OR) logic gates. Design-II is implemented using PERES, TOFFOLI, and FREDKIN reversible logic gates. These

designs are simulated and synthesized using Mentor Graphics tool. The result shows that design-II is more efficient in terms of transistor count and power consumption.

A Stock well Transform based Approach for the Detection and Classification of Hig Impedance Arc in Leaning-Tree and Sphere Gap

Himadri Lala and Subrata Karmakar

Abstract: This study presents an analysis of arc due to a leaning-tree on a medium voltage distribution line and the arc in between sphere-gaps. A Stockwell Transform (ST) or S-Transform based approach is used for the detection and classification of real-time arc signals of different arcing conditions. In addition to that, the conductance characteristics for both the arc event are also observed for different voltage levels and sphere-gap length. The results obtained by the application of ST technique on arc voltage signals successfully detects and classifies high impedance arc due to leaning-tree from sphere-gap arc fault on the basis of their harmonic signatures.

Comparison of Five-level and Seven-level Converter for Grid – Independent PV System

Akash ingle and Lumesh kumar sahu

Abstract—Demand of multilevel converter topology has been increasing since last few decades because it consists of lesser number of switches and DC sources. Research of multilevel inverter (MLI) has always been a noteworthy inspiration to increasing number of levels with decreasing total harmonic distortion (THD). In this paper, a comparison is based on existing five-level MLI and proposed asymmetric dc source based topology of seven-level inverter which consist of less switch count and reduced THD. Multicarrier pulse width modulation techniques are adopted for triggering the gate pulses. The simulation results are carried out by using MATLAB/Simulink software package.

Energy-Efficient Cluster Head Range System for MANETs

K. Yadaiah, B. L. Raju and D.N. Rao

Abstract: Clustering is one of the imperative technique for improve the system lifetime in mobile ad-hoc networks (MANETs). It includes collection of hubs into groups and choosing bunch sets out towards each bunch. Cluster heads can accumulate the information from every bunch's hubs and forward the collected information to fundamental hub. An important test in MANET is to choosing the primary fitting group heads. In this manuscript, a novel based leadership approach with fluffy numerous criteria is presented. It depends on progressive fluffy basis and various fuzzy parameter basis leadership which is known to improve the choice of group heads to build up a dispersed vitality effective bunching calculation. An important process of fluffy logical chain is a single parameter considered all the while as the principle factors that can impact the choice of group heads while each factor contains some sub-criteria. The problems with single criteria are more prominent in light for remaining vitality regardless of other data, similar to area of hubs, number of neighbor hubs and so on. So typical hubs expend more vitality to send their information to cluster heads (CHs). So, different parameter leadership approach is utilized to choose CHs utilizing criteria including leftover vitality, number of neighbors, separation from the primary hubs and area. This approach is more useful in

expanding the availability inside each bunch and furthermore confining high force activity inside a group.

Application of PD based Fuzzy PI Type FACTS Device and PSS Controller in Enhancing the Power System Stability

Bidyadhar Rout and B.B. Pati

Abstract: This paper presents the Proportional Derivative based fuzzy PI type Static Series Synchronous Compensator (SSSC) and PSS for improving transient stability in power systems in a wide range of operating points. The three phase disturbance at various locations and various constraints are considered for system performance analysis. The positive damping torques produced by this proposed controller improves the steady state error of electromagnetic oscillations very effectively as compared with leadlag (LL) type SSSC and PSS compensator. A three by three fuzzy logic control rule has been employed in the proposed controller for adjusting the controller parameters during unpredictable disturbances in power systems. The input to the controller is generator speed deviation. Modified Sine Cosine Algorithm (mSCA) is used for optimizing problem for controller parameters. The whole work is carried out under MATLAB environment platform.

Optimization of Software Controlled Remote Center of Motion Manipulator for Maximum Isotropy

Siddhesh Rane and Dr. P.V. Manivannan

Abstract: Minimally Invasive Surgery(MIS) is a type of surgery where surgical instrument e.g. laparoscope, endoscope etc. is inserted into a human body through a small incision. The instrument has to be manipulated about the insertion point also known as trocar point to avoid tearing of the skin. Robotic manipulators with Remote Center of Motion (RCM) mechanism are extensively used in this kind of surgery. Kinematic design is important phase in design of such manipulator to ensure safety, accuracy, ergonomics and dexterity. In this paper link lengths of the software controlled RCM manipulator are optimized to maximize global isotropy. Global Conditioning Index (GCI) over the defined workspace is used as metric of global isotropy. Index Terms—Minimally Invasive Surgery (MIS), Software Controlled RCM, Global Conditioning Index (GCI)

Analysis of Grid-Connected Single-Phase Quasi Z Source Inverter for Distributed Generation Systems

Beena V, Jayaraju M and Gourikrishna

Abstract: Distributed Generation (DG) have a major role in future smart grids. For the integration of DG such as solar to the utility network, power electronics interface is necessary. A Quasi Z-source inverter (qZSI) is developed from Z-source inverter (ZSI) and used as a power conditioning unit .In conventional voltage fed ZSI, the input current is discontinuous in the boost mode, and capacitors must sustain a high voltage. Conventional boost converter used for maximum power tracking of solar based power generation is replaced with quazi Z source network which consists of passive elements like inductors & capacitors. This paper address the performance of grid connected qZSI suitable for DG units like PV, fuel cell etc. is analyzed by controlling the shoot through duty cycle. By this the output power can be controlled. In this control technique a PI controller is used for controlling the modulation index for injecting the maximum power with unit power factor and low THD current. Simulation results show the effectiveness of the system.

Design and Implementation of an Internet of Things based Prototype for Smart Home Automation System

Kshirod Kumar Rout, Samuchita Mallick and Sivkumar Mishra

Abstract: The concept of automation coupled with advancement in technology and Android based smart phones have resulted in refined and smart lifestyles. When automation as a concept gets implemented via internet of things (IoT) which is concerned with accumulation /aggregation of connectivity, it gives rise to a smarter home network. In this paper, an IoT based prototype of a smart home automation is designed and implemented. The proposed prototype smart home system along with its Android App and ATmega16 as its main controller is successfully implemented and the results of the implementation are presented.

Novel Schemes for Minimizing the PAPR in LTE-OFDM System

Chanamala Vijay, Gottapu Sasibhushana Ra and, Vinodh kumar Minchula

Abstract: Orthogonal Frequency Division Multiplexing (OFDM) has gained an increasing attention due to its potential for supporting higher transmission rates in frequency selective fading environments which causes Inter Symbol Interference (ISI). Though, OFDM system has the drawback of large Peak to Average Power Ratio (PAPR) of the signals which are transmitted with a non-constant envelope. Power amplifiers with a large dynamic range are used to reduce PAPR in OFDM system applications. Due to which, the complexity and cost of the system increases. So to overcome this, different PAPR reduction schemes are used. The existing PAPR reduction schemes i.e. Selective Mapping (SLM), Clipping and Filtering (CF) Schemes are discussed and Novel Schemes are proposed in this paper. Based on BER analysis Novel schemes outperforms when compared to SLM and CF.

Wireless Optical based Backhaul communication for 5G Cellular Systems

Vinod Kumar Mogadala, Sasibhushana Rao Gottap and, Babji Prasad Chapa

Abstract: Fourth generation wireless cellular systems are currently being deployed uses radio frequencies (RF) of 2.1-2.6GHz electromagnetic spectrum, which is the maximum RF frequency range among all other cellular generations. However, its performance is limited by 1Gbps/100Mbps data rates for pedestrian/mobile users. As the number of mobile users and IoT devices are increasing day by day all over the world, the 5th generation cellular system should be able to support 1000 times more capacity and 25 times higher cell throughput than the existing systems. In 5G, proposed millimeter wave communications (MMW) communications have several disadvantages such as higher attenuation which limits the coverage area. In this paper, the possibility of using optical spectrum (1012- 1014Hz) is explored in place of RF spectrum for increasing the capacity of the base station to base station backhaul cellular communication.

Artificial Bee Colony Optimization for Improved Position Estimation of a GPS Receiver

Ashok Kumar.N and G.Sasibhushana Rao

Abstract: Metaheuristic based computational approaches provide high quality solutions for nonlinear system applications. In the metaheuristic optimizations, the methods applied for the estimation of

desired solution is based on the natural instinct of a particular biological species. In this paper, honey bees natural behavior and organization among the bees of its colony for the food search laid a path in the design of optimization technique called as Artificial Bee Colony (ABC) optimization. The ABC algorithm is implemented for the estimation of a GPS receiver position. The results show that the ABC optimization algorithm is better for GPS receiver 3D position estimation.

Analysis of Various Trust based Security Algorithm for the Vehicular Ad-HoC Network

Kuldeep Narayan Tripathi, Dr. S. C. Sharma and Ashish Mohan Yadav

Abstract: Due to the exponential growth in the automobile industry and road transport, there is need of intelligence transportation system (ITS). Vehicular ad-hoc is a part of intelligence transportation system (ITS), which provides security, traffic efficiency and ease to the user. In Vehicular network various nodes exchange the messages and data for the communication. For transmitting the data from source to destination node, we have to rely on intermediate nodes due to limited range of the vehicular nodes. To check the reliability of data delivery we have to find out that which node is trustable or which node is faulty. There are various algorithms presents by various authors to compute the trust of different-different nodes presents in the network. Trust based algorithms are easy to implement and requires very less calculation overhead. The authors have studied and analyzed various trust based security algorithms in terms of approach and tools used by different authors. The different attacks and the limitations of the various trust based security algorithms are briefly summarize in table-1. Further authors have compiled in table- 2 the attacks with targeted services and possible solutions. The various simulation tools used to simulate the vehicular ad-hoc network are summarized in table-3. The paper is useful for the bingers who wish to carry out further analysis on trust based security algorithms for vehicular ad-hoc network (VANET).

A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier

Bethanne Janney.J, S. Emalda Roslin and Shelcy Mary Jo

Abstract: Skin cancer cases have grown worldwide, and it is by far the most common of all cancers. It is caused by the extended exposure to harmful radiations from the sun. Skin cancer can be broadly classified into two categories as melanocytic and non-melanocytic (benign). Most basic way to detect the threat of skin is by visual investigation performed by a specialist dermatologist employing a set of specific clinical tools. This paper describes novel image processing approaches for skin cancer detection using dermoscopy images. The motive of this work is to investigate and prefer an algorithm for skin cancer determination that can group the lesions as malignant or benign melanoma in terms of accuracy, sensitivity and specificity. Initially, the image samples showing melanoma are obtained by using dermoscope and segmented. It is then given for feature extraction and the results are classified using Support Vector Machine (SVM), Artificial Neural Network (ANN) and Naive Bayes Classifiers.

Design and Analysis of WOA MPPT with Multilevel Interleaved Boost Inverter for Solar PV Panel

Bikram Kumar Pati and Laxmidhar Senapati

Abstract: This paper is to study and compare the two Maximum Power Point Tracking (MPPT) Algorithm .The Perturbation and Observation (P&O) and Whale Optimization Algorithm (WOA) models are designed in the MATLAB/SIMULINK. The outputs signals are generated from the MPPT

are used as control signal to the Interleaved Boost Converter (ILBC). Cascaded H-Bridge Multilevel Inverter (CHBMLI) is used to convert Direct Current (DC) into the Alternating Current (AC) with high Magnitude and Less Harmonic Distortion. The Total Harmonic Distortion (THD) are calculated at the output of CHBML Inverter for the two MPPT method. By comparing the results it can be observed that the WOA are produces less Distortion as compare to P&O method nand also WOA MPPT are track the maximum power as compared to P&O MPPT method.

Optimization of Software Controlled Remote Center of Motion Manipulator for Maximum Isotropy

Siddhesh Rane and Dr. P.V. Manivannan

Abstract: Minimally Invasive Surgery(MIS) is a type of surgery where surgical instrument e.g. laparoscope, endoscope etc. is inserted into a human body through a small incision. The instrument has to be manipulated about the insertion point also known as trocar point to avoid tearing of the skin. Robotic manipulators with Remote Center of Motion (RCM) mechanism are extensively used in this kind of surgery. Kinematic design is important phase in design of such manipulator to ensure safety, accuracy, ergonomics and dexterity. In this paper link lengths of the software controlled RCM manipulator are optimized to maximize global isotropy. Global Conditioning Index (GCI) over the defined workspace is used as metric of global isotropy.

Design and Development of IoT-Cloud-based Lightning/Storm Detection System with an SMS Alert on Android Mobile

Raghavendra Rao Kanchi, Divyavani Pale and Venkata Prasad Sreeramula

Abstract: Weather monitoring in general and lightning detection in particular is of paramount importance since it is life threatening to humans and animals, dangerous to electronic gadgets. It is important to monitor the lightning detection in real-time to avoid the deaths caused by lightning. In this paper we present the design and development of an IoT based Storm (Lightning) detection system with a provision to display message on an Android mobile using Cloud computing technology. The entire system is built around Franklin lightning detector chip AS3935 on a thunder click board with an on-board integrated coil antenna MA5532. This board is connected to the Texas Instruments' CC3200 LaunchPad and SIM900A GSM module to complete the design. The communication interface established between sensor and ThingSpeak cloud via CC3200 will help online data monitoring anywhere in the globe. Provision is made to store the history of lightning on a SIM card for further analysis such as estimation of rainfall. The experiment is performed at Sri Krishnadevaraya University, Anantapuramu. The identified location and the lightning values are displayed on Cloud (IoT-Cloud). The software is developed using Energia IDE.

Simulation and Analysis of Single Phase Full Bridge Diode Rectifier with Different Passive Power Factor Correction Techniques

G V Aparna, G Suresh Babu and T Murali Krishna

Abstract: It is needless to say that many industrial applications invariably demand DC power supply. As AC power is abundantly available it is economical to convert it into DC and to used for industrial loads. Converter circuitary being fabricated with solid state components, the supply gets distorted with the harmonics injected. This problem can be overcome by placing proper passive filters in the input

side which is evident from simulation analysis carried out in this paper by using different techniques the entire analysis is carried out in MATLAB/SIMULINK environment.

Design of Lane Detection Warning System using Matlab Simulink

Manoj K. Demde and Dr. Prashant S. Sharma

Abstract: This research work describes implementation of a lane detection system using Hough Transform and deliver a warning signal to the driver. In this system the input to the system is video streams recorded by the video camera mounted on the vehicle. The input is processed by using Image processing algorithm, Edge detection, Hough Line and Hough Transform to detect lane marks. Edge detection is one of the important part of image processing. Edge detection is the processes to detect the sharp changes in intensity value (pixel value) of the image. The detected lane marks and vehicle positions are used to determine whether the vehicle stays on its lane or stays out of lane. And if the vehicle move towards the Lane, warning signal deliver to the driver. In this research work make a natural video of Lane in different light, weather and road conditions using prescan software is processed by using Image processing algorithm, Edge detection, Hough Line and Hough Transform to detect lane marks. In this research we deal with MATLAB/SIMULINK model for Image processing algorithm, Caney's edge detection Hough Transform.

Decoding Brain Signals using DWT and MFCC

Sneha Varma, Aishwarya Jaiswal, Ayesha Mundu and Akriti Nigam

Abstract: This paper is based on a research on BrainComputer Interface (BCI) designed using electroencephalogram (EEG) signals generated from 9 subjects. The cue-based BCI paradigm includes two different motor imagery tasks, namely the imagination of movement of the left hand (class 1), right hand (class 2). Two sessions were conducted for each subject. Discrete Wavelet Transform (DWT) and Mel-frequency cepstral coefficient (MFCC) have been used for feature extraction process. Extracted EEG features are classified using KNearest Neighbor (KNN), Support Vector Machine (SVM) and using the labels generated we controlled media playback using VLC player.

Identification and Study of the Kinematic Parameters for an Autonomous Ground Vehicle

Praneeth Kumar Pedapati, Anantha Sai Hari Haran and Santanu Kumar Pradhan

Abstract: In this paper, an Autonomous Ground Vehicle's (AGV) kinematic model has been identified using Recursive Least Square Algorithm. Precise control of a dynamic system demands that a mathematical model as accurate as possible of the system is available. This requires that all the parameters of the system are known or can be calculated. In this paper, identification of such kinematic system is performed using the input-output simulation data using Recursive Least Squares method and the identified model of the system is validated by studying the simulated and experimental results of the presumed mobile robot. This is done with an emphasis on the need of system identification in designing any controller for the differential drive mobile robots.

Observatory Stations under Probe Odisha: Weather Database Management for Weather Predictions

Parimita Mohanty, Himansu Mohan Padhy, Pranati Mishra and Aradhana Misra

Abstract: Odisha is a vulnerable state of the country for natural calamities, being located at the coastal belt of Bay of Bengal. Therefore, it has been a need to do proper weather predictions for effective

management of the natural disaster management. More the number of observations, more accuracy shall be there in the predictions. Therefore, the Department of Science & Technology, Government of India, New Delhi had sponsored a noble programme namely the Participation of youth in Real time/field observations to Benefit Education (PROBE): Odisha programme, which was executed in the state of Odisha successfully. Where about more than 500 observatory stations were set up in different Government High Schools located in different parts of the state. Sophitorium Group of Institutions took a leading role in the implementation of this program. The database from each observatory was collected and was analyzed. The database developed has been utilized for the weather prediction modeling. Under the PROBE-Odisha programme the atmospheric data containing, Temperature (minimum and maximum, dry and wet), Wind (speed and direction) has been collected on daily basis. Statistical analyses were done for the weather predictions. The dew point temperature and relative humidity have been calculated with the help of dry and wet bulb temperatures and the numerical equations. In the present paper, different modeling developed is discussed. Further scope of work to make the system completely automated by supplementing a PDA device at each observatory, which could in return be connected to a server is also discussed. Therefore, all in final an automated decision support system for weather prediction is envisaged.

A Comprehensive Study on Disjoint Paths in Planar Graphs

Ehsan Jekar, Reza Fotohi and Behnam Seyedi

Abstract: Given a planar graph $G = (V, E)$, we have to decide whether or not G has k disjoint paths connecting given pairs of terminals. There is another version of the problem, called disjoint s - t paths problem, in which the given graph G has two specified vertices s and t and we have to find a set of disjoint paths from s to t of maximum size. We study this problem in planar graphs which occurs in many applications like road traffic. In this paper we focus on solving disjoint s - t paths problem using maximum flow problem, which is also a very well-known problem in network optimization.

Effect of Underlap with Fixed Gate Length: GaN Based Double Gate MOSFETs

Md. Rokib Hasan, Marwan Hossain, Kefayet Ullah, Sk. Abu Rohan, Nafis Farhan Rashid, Farah Rafia, Maisha Rashid Nidhi and Ahsan Intishar Tomal

Abstract: The effect of gate length 8 nm with underlap of double gate MOSFET has been designed for VLSI Technology. The evaluation process was followed by NEGF (non-equilibrium Green's function) formalism using SILVACO ATLAS followed to ITRS- 2013. The investigations on the threshold voltage, Sub threshold Slope, ION, IOFF, ION/IOFF, DIBL and switching characteristics of the electric field have been done with the simulation results. In the simulation, adopting symmetrical distances from source to gate and gate to drain (S-G and G-D) by fixing the gate length identical are cited as underlap. Here, the observation has been done for LUN= (0 to 4 nm) underlap length. GaN and HfO2 have chosen as channel material and dielectric material respectively. Proposed devices structure indicates that GaN-based DG-MOSFETs for LG=8 nm with various underlap lengths is a promising candidate for the aspect of modern VLSI applications.

Analysis of Various Routing Schemes of VANETs

Tejinder Pal Singh and Nitika Kapoor

Abstract: Vehicular ad hoc networks (VANETs) are developing very speedy which affords the communication between transferring motors on the road and the street aspect devices without the usage of any infrastructure. A VANET is a part of MANET that provides connection amongst vehicles

and street side infrastructure. This paper describes various characteristics, architecture of VANETs. This Paper also describes various challenges and transmission techniques used in VANET to distribute data among vehicles or other infrastructure units.

Multimedia Big Data Security

Preeti Chauhan, Arjun Choudhary and Atul Kumar Gupta

Abstract: The 21st century is all about data where the main producers are Social Networks, Smartphones, Personal Medical Reports etc. In earlier times data volume used to be in MegaBytes and GigaBytes but in the present scenario PettaBytes or ZettaBytes of data is coming with a very high speed with different varieties from the above sources. Data and Security in today's time are complimentary in nature that needs to be addressed simultaneously and to provide security to such huge amount and variety of data, different encryption/decryption models are used. Multimedia data and its use have reached to gigantic level and as it belongs to the millions of user's, the security of data is the primary concern. So, there should be the ways through which one can ensure the best possible practice to enhance the security of Data. This paper focuses on various techniques to secure the multimedia data which existed in various types like image, audio, chat, videos and text and also this paper provides an overview of available multiple encryption schemes to secure the different forms of multimedia data and critically analyse them.

An Efficient Approach for Defence Against Flooding Attacks in Ad hoc Networks using by Clustering Schema

Behnam Seyedi and Reza Fotohi

Abstract: MANETs (Mobile Ad-hoc Networks) are mobile networks, which are automatically outspread on a geographically limited region, without requiring any preexisting infrastructure. Mostly, nodes are both self-governed and self-organized without requiring a central monitoring. Because of their distributed characteristic, MANETs are vulnerable to a particular routing misbehaviour, called flooding attack. Therefore, Security challenges have become a key concern to provide secure communication between mobile nodes. Flooding attack is one of the security threat in which the intruder will overload the network with worthless packets to misuse the bandwidth and resources of the network. In this paper, a clustering behavior based reputation mechanism is proposed to identify the flooding malicious nodes MANETs. As in battlefield situation, mainly Group Mobility model is followed, so grouping of nodes in clusters have various advantages. Reputation (assessment of its behavior in the network) of a node is calculated at cluster heads. This strategy has double nature; hence it efficiently fixes the false detection of genuine nodes as malicious ones. The proposed protocol, called Immune-CDSR (Immune Cluster based DSR) employ cluster approach to defend against flooding attacks. ImmuneCDSR is evaluated through extensive simulations in the ns-2 environment. The results show that Immune-CDSR outperforms other existing solutions in terms of throughput, end-to-end delay, packets delivery ratio and packets drop ratio.

Email Spam Classification using Machine Learning and Computational Intelligence Techniques

Kriti Agarwal and Tarun Kumar

Abstract: With the advancement in technology, communications means are also improved. Human is shifted from earlier communication means (like short messages, hand written letters, telephone,

telegraph, radio etc.) to advanced internet based communication means (like Email, Social Networking apps, like video streaming etc.). Email is one of most preferable source of communication for the official and business aspects. With the increasing users, email has also become the source of marketing for any business. So, one can always check so many phishing, spoofing & spam emails in their mailbox along with useful emails. There is always need of some technique/classifier that can block or filter the spam emails from authentic emails. Researchers are continuously working to develop/improve autonomous email spam classification systems. In this paper, a comprehensive review on the email spam classification system using computational intelligence and machine learning concepts is presented. Available methods are explored with author & year of research article, email spam classification technique, experimentation dataset and key features of research article. Use of individual machine learning and computational intelligence techniques is presented along with the use of their integrated approach as well. This research paper also presents the basic email spam classification process and research challenges for the classification.

Automatic Cheque Number Recognition using Neural Network

Ms.K.Bramara Neelima and Dr.T.Saravanan

Abstract: this work is aimed to design an intelligent cheque number recognition with an artificial neural network for automatic Cheque processing. For automatic cheque number recognition, a back propagation artificial neural network with single input layer, one hidden layer and single output layer is implemented. The work aimed to analyze the performance of the system by varying the regularization parameter i.e learning rate. Performance of the system is also analyzed using the learning curves to determine whether it has high bias or high variance. From the result of learning curve the optimal training sets required for the accurate recognition is decided. The performance of the system is analyzed by using correct detection which is defined as the ratio of correctly recognized digits to the total number of digits in the test set. The computational complexity for the training of 2094 data set is achieved around 909 seconds.

Identification of Distance Relays Vulnerable to Power Swing in a Power System

Vidushi N, Sanjana K, Aniket P, Pavan G and Dr. S. A. Lavand

Abstract: Distance relays in a power system are prone to trip on power swing. A power swing blocking (PSB) function has to be provided with it to avoid the mal-operation. However, utility engineers are generally biased towards dependability. Therefore, zone 1 of a distance relay which provides primary protection. It is normally not supervised by such PSB function, but some times such tripping under severe power swing may trigger further cascade tripping in the system. Hence, utilities have to decide a policy for implementing the blocking function for various zones of the distance relay without compromising the dependability. The present paper offers an offline simulation based testing tool to identify distance relays vulnerable to power swing so that PSB function can be provided to only these relays selectively. The logic can be further extended to decide which zones to be prevented from tripping during power swing

Modern Agricultural Farming based on Robotics and Server-Synced Automation System

Md. Abu Bakar Siddik, Mou Deb, Priyanka Das Pinki, Mrinal Kanti dhar and Md Omor Faruk

Abstract: Traditional agricultural system suffers from various problems like cost, labor, productivity, time consumption etc. Introducing automation and robotic system in farming could be a solution of

these problems. In this paper, we introduce a server-synced robotic system which can monitor, control, and function intelligently under different circumstances. It performs two kinds of operation – functional and analytical. The functional part includes fruit picking, insecticide spraying and pumping. Analytical part performs detecting ripe fruit and making irrigation schedule. Combining these two parts, a robot is designed which can detect, pick and store ripe fruits. A drone is used for spraying insecticides. We introduce server-synced autonomous irrigation system where a dedicated server keeps agricultural and environmental data month-wise and facilitates a simulator designed by us to make a precise irrigation schedule. Image and video processing, database matching, vehicle navigation and different sensors have been used to increase system reliability.

Analytical Study on Fractal Dimension- A Review

Sumitra Kisan, Sarojananda Mishra, Gargi Bhattacharjee and Ronak Bansal

Abstract: Fractal theory can be viewed as one of the vital aspects of image processing. The roughness and pattern details for any naturally occurring element can be described through Fractal Dimension (FD). FD proves to be an effective tool for classifying different shapes in texture segmentation and performing graphical analysis in various fields of image processing. The literature has set forth quite a few approaches for calculating FD. One of the most elegant method for gray images is box counting. This paper offers an analysis of the existing approaches applied on gray images for calculating their FD. The prime issues associated with these approaches are reviewed and finally a relative study of their complexity is showcased. We have also experimentally compared our previously proposed approach (Relative Improved DBC) with the improved DBC method. In addition, we have also established the difference among the FDs calculated by the existing methods in literature.

IoT X NodeMCU12e X MAX30100: An Experimental Survey with Pulse Oximeter and Heart Rate Sensor

Antonio Carlos Bento and Norberto dos Santos

Abstract: This study presents the results of an experimental survey on the application of the internet of things in the use and development of pulse oximeter and Heart-rate sensor devices, presenting the coupling capacity as well as in the configuration for creating a feasible solution, contributing as a reference for the development of new solutions for the monitoring and improvement of people's quality of life. Due to the constant growth in the creation of solutes using IoT, this work has a focus on presenting solutions that can attend a part of large projects, which can be considered for future studies. The results obtained with this study made possible the understanding for the construction of a prototype, which allows to attend realistically and applied in a case of study.

IPV4 X IPV6, Results of a Study about Use of Internet Addresses

Antonio Carlos Bento, Gabriel Alexandre Vieira, Osvaldo Julio Santos Monteiro and Luiz Henrique Furquim Sanches

Abstract: This paper presents the results of a study on computer networks, using the exploratory research methodology, comparing scientific articles on computer networks; specifically on the scarcity of IPv4 (Internet Protocol Version 4) addresses. Based on the searches on the subject in articles published by nic.br, cert.br, registro.br, etc. In 1992, 24% of IP addresses were already allocated. In 2005, this number surpassed 2 Billion IP's, and in 2010 it was already allocated around 3 Billion. By

2014 there were only 110 million available IP's. Based on these studies, this project was developed to support and support the thesis that IPv4 will no longer be used as of 2019.

A Review on Techniques for Intelligent Traffic Management System

Gurpreet Kaur, Usha Mittal and Kamalpreet Kaur

Abstract: With the increase in number of vehicles day by day and advancement in technology, traffic congestion becomes a big issue in urban areas. Major causes of the congestion are increase in vehicle count and inadequate construction of roads. It leads to air, noise and soil pollution because vehicles emit large amount of carbon dioxide. Although, research is going on for the designing of adaptive intelligent systems, still in India conventional traffic control system is used, which uses predefined counters having fixed values. This system leads to high waiting time of vehicles. Moreover, this systems does not give priority to emergency vehicles like ambulance, fire brigades etc. To overcome these problems, various artificial neural network, fuzzy logic, image processing and wireless sensor based techniques have been introduced by researchers for managing the traffic. In this paper, a review of these techniques has been done together with their design constraints, merits and demerits. Also, we have implemented fuzzy based system and Adaptive neuro fuzzy inference system in MATLAB. Experimental results of these techniques are compared with fixed timer based system in terms of green signal timing duration and waiting time of vehicles at next lane. Simulation results show that these systems are more efficient as compared to traditional system as they reduce waiting time and increase flow rate.

A Comparative Analysis based on Security Parameters for Internet Integrated MANET: A REVIEW

Mayank Tyagi, Shoaib Abbasi, Shobhit Kumar and Pooja Verma

Abstract: Mobile Ad hoc networks are types of Ad Hoc network. It is a continuously self-configuring, infrastructureless network of mobile devices connected with a wireless communication channel. Routing, gateway discovery, security etc. Are some designing issue which are arises during the internet integration process. Security is a major issue because of some vulnerability such as no Secure Boundaries, scalability and security etc. Therefore, various attacks possible such as Monitoring, Eavesdropping, Gray hole, wormhole etc. The aim of this paper is to present basic security primitive, types of attack and analysis over these attacks and based on security parameters analysis over existing mechanism to provide security along their limitation.

Day Ahead Load Forecast using Linear Regression and Artificial Neural Network Technique for 22kV Urban and Industrial Feeder

Harsh M. Patel, Mahesh K. Mangunkiya, Pratik A. Desai, Tejal H. Patel and Mahesh H. Pandya

Abstract: An accurate load forecasting is most important for load management in residential area as well as in industry. Day a head forecast is one type of short term load forecast. In this paper two different industrial and Urban 22kV feeder data use for forecasting. For forecasting different technique

use. Now a day artificial intelligent technique uses because they give batter result compare to conventional technique. In this paper the Linear Regression (LR) and the Artificial Neural Network (ANN) are used to study the Short Term Load Forecasting (STLF). Using pattern recognition which obtains input sets belong to Multi layered feedforward Neural in which Levenberg- Marquardt Back Propagation (LMBP) learning algorithm used to train samples. Historical data used for trained network. The sensitivity of the weather data for the STLF is verified. Results compare according to the Mean Absolute Error (MAE) and the Mean Absolute Percentage Error (MAPE). ANN technique proved accuracy in STLF for the Urban and the industrial feeder.

Routing Protocol Enhancement in Mesh Networks for Indoor based Location Services Using Pollination based Algorithm

Meenakshi Nayyer and Vimal Kriti Sharma

Abstract: Indoor locating systems (I.L.S) allows us to trace the position of items and individuals inside buildings. GPS, however, is not reachable in indoor spaces, as there is no optical interaction with the G.P.S satellites. Moreover, with GPS, it is unmanageable to determine the floor level on which a device is placed. Thus, due to this downside, many other signals have been used for executing indoor based localization like Wi-Fi, Bluetooth, R.F.I.D, V.L.C (Visible Light Communication). In all of the stated methods, they use different nodes to track down the target by following a certain routing scheme. This work presents a protocol with an enhanced route-finding mechanism that eludes the jamming in the route.

Design and development of IoT based System for Retrieval of Agrometeorological Parameters

Aishwarya R. Jangam, Prof. Dr. K. V. Kale, Sandeep Gaikwad and Dr. Amol D. Vibhute

Abstract: The Internet of Things (IoT) has the ability to transform agriculture industry. Smart farming based on IoT technologies will help farmers to increase yields and better crop management. The objective of this research is to design and develop a near real-time web-based weather and soil monitoring system capable of increasing the crop yield with the help of study of different weather and soil parameter values. This implementation resulted in a monitoring system that can collect the current air temperature, humidity, dew point, heat index, air pressure, rain intensity, soil moisture and soil temperature. The system provides current updates of soil and weather parameters as well as historical values of those parameters. The result obtained in this research is used for computing heat index and monitoring environmental effect on crops. This study demonstrates the ability of data acquisition in the near real-time and remote location accurately and efficiently.

An Experimental and Applied Survey with Internet of Things and NodeMCU12e with Tft Nextion

Antonio Carlos Bento

Abstract: This study was developed on an Internet of Things application, in which experiments were created and applied in a prototype for tests, being this part of a project that includes the validation of data during the transmission by sensors, when performing a collection of information in patients. During the research, different types of experiments were performed considering some types of lcd monitors for use with Arduino, in this way the display tft Nextion was selected, because it presented

some interesting characteristics that were supported for the project. The results presented the possibility of developing solutions that could contribute to different types of studies, which involve the internet of things.

Detection of Oral Cancer in H&E Stained Images using Convolution Neural Networks

Rajashekhargouda C. Patil and Dr. Mahesh P. K

Abstract: Cancer is an abnormal growth of tissue. It can be defined as an uncontrolled cell division. Even on having hospitals dedicated to detect and cure cancer situated in many cities across India, the mortality is at alarming rate. If the cancer location is in the mouth, then it is termed as "Oral Cancer". In this paper we propose a procedure to detect and differentiate the benign photo micrographs of Hematoxylin and Eosin stained images from the malignant photo micrographs of Hematoxylin and Eosin stained images through the help of different features identified by the deep learning method.

Review over Mobile ad-hoc Network in Lightweight Cryptography Environment

Raghvendra Patel, Sonika Shrivastava and R.K.Pateriya

Abstract: The Mobile Ad-hoc Network is an newly emerging approach in the world of communication. The communication take place between devices having the ability of communication. the most popular techniques involved the mobile ad-hoc network. There are various types of attack can possible in the network. This technology has many advantages but have the loophole. This paper is a brief discussion on Mobile ad-hoc Network. This paper also throws some light on the various types of attacks like and its classification and other techniques used to enhance the performance of network.

Continuous Kannada Noisy Speech Recognition

Nadeem Pasha and Roopa.S

Abstract: ASR converts speech signal into corresponding text form. The performance of an ASR decreases under noisy environment. To overcome this problem a speech enhancement need to be performed on noisy speech before being fed to an ASR system. Speech enhancement techniques have been developed over past several decades, some of these techniques introduce musical noise. To achieve further improvement in recognition accuracy, a generalized distillation framework is used in which machines learnsmachines. In this paper, an ASR is implemented for noisy kannada language speech using generalized distillation framework. In this framework, a teacher machine is trained with clean speech and student machine with 4 different noise speech and teacher machine help student machine to learn by providing additional information needed. During test phase, a student machine is tested with 4 different noise speech other than used in training. A DNN acoustic model is build using a 39 dimension MFSC features and bi-gram language model is created using Kaldi Speech Recognition Toolkit. Experimental results shows that generalized distillation framework for kannada noisy speech achieved a reduction in WER compared to an HMM-GMM approach.

Design and Development of a Mobile Robotic Complex

Aigul Adamova, Tamara Zhukabayeva, Laula Zhumabayeva, Zhanna Mukanova and Khu Ven-Tsen

Abstract: Development of the mobile robot can be executed in two different ways. Firstly, this creation of the built-in system,secondly, the use of "ready to use" industrial components. With distribution of

the industrial mobile robots in the market there are more and more components which can be used for creation of all control system and sensors of the robot mobile platform. Use of the ready components doesn't demand the hardware development that accelerates time of development and reduces cost. The chassis of the Belarus-132 mini-tractor is used as a platform of robotic system in the research, "creation" of the program for traffic control is required. Results of the practical research on design and model development of a mobile robotic complex are given.

Shunt Active Harmonic Filter for Grid Connected Inverter

Miss. Supriya Sunil Kadam and Dr.Prof.Yuvraj Krishnarao Kanse

Abstract: This paper represents the application of Shunt Active harmonic filter for grid connected inverter. Active Harmonic Filter can be utilized with inverter in Grid connected or islanded mode. The paper firstly reviews comprehensive survey on the research of a specific topic in power electronics engineering, power system quality improvement of grid connected inverter using DFACTS (Distributed Flexible AC Transmission System). Next, the system simulation of Active Harmonic Filter with grid connected inverter is expressed (MATLAB SIMULINK Model). Finally the simulation results across the load, THD, Error in Grid voltage and Inverter Voltage is analyzed.

A Unified Approach for Controller Design in Delta Domain using BFO Algorithm

Prasanta sarkar, Arindam Mondal and Sujon Roy

Abstract: In this paper a unified framework for controller design in delta operator parameterized systems using Bacterial Foraging Optimization Algorithm(BFOA) is proposed. At fast sampling limit, dynamic systems modelling using delta operator provide a unified framework in reconciliation between discretetime models and its continuous counterpart. The BFOA has been used as an optimization tool to minimize the performance index (fitness function) that has been defined for controller (PID, Phase Lead) design in model matching framework which calls for a reference model. The reference model parameters are computed in the complex delta domain from the classical time, frequency and complex domain specifications. Several numerical examples with simulation are provided to illustrate the usefulness of the algorithm.

A Unified Approach for Model Order Reduction in Delta Domain using BFO Algorithm

Prasanta sarkar, Arindam Mondal and Sujon Roy

Abstract: This paper proposes a unified framework for reduced order modeling (ROM) in delta using Bacterial Foraging Optimization Algorithm(BFOA). Dynamic systems modelling using delta operator provides a unified framework in reconciliation between discrete-time models and its continuous counterpart at fast sampling limit. The BFOA has been used as an optimization tool to minimize the fitness function (performance index) that has been defined for reduced order and original higher order system in model reference control (MRC) framework. The reference model parameters are computed in the complex delta domain from the classical time, frequency and complex domain specifications. Several numerical examples with simulation are included to justify the effectiveness of the algorithm.

Prediction of cost and defects in software development using the Bayesian Algorithm

Madhuri Devanaboyina and Dr. K. Sita Kumari

Abstract: Software Development is the discipline of initiating, organizing, executing, controlling and completing the work of a group to accomplish target and meet progress. Machine learning algorithms are utilized in software development for better Performance. Machine learning algorithms have proven to be of great practical value in a variety of application domains. They are particularly useful for (a) poorly understood problem domains where little learning exists for the people to develop powerful algorithms; (b) domains where there are expansive databases containing valuable implicit regularities to be discovered; or (c) domains where programs must convert to changing conditions. Machine learning is a kind of Artificial Intelligence (AI) that enables programming applications to end up more exact in expectation results. The objective of the project is to predict the cost and defects of the project. The Bayesian algorithm is implemented on the data set and decision is made whether the project can be continued or not based on the output values.

A Novel Method in Software Cost Estimation using Fuzzy Logic Techniques

Shahzad Kalantar and Amid Khatibi Bardsiri

Abstract: Software Development Effort Estimation (SDEE), the process of forecasting the effort required to develop a software system not only can be considered as software development efforts, but also can include the effort required to maintain the software. Although the effort is only a large part of the software costs, it is the main factor in determining the cost of the software. The term "software cost estimation" in most paper works is equivalent to the estimate of software development effort. The exact estimation of the required effort in the early stages of software development plays a very important role in project management. Although in recent years, with the goal of raising accuracy, the use of machine learning methods in estimating software development efforts has been more widely considered, but none of the available models are appropriate in all circumstances and they offer different degrees of accuracy for different kinds of datasets. Therefore, there is a need to build an estimating model that is reliable and provides high precision. Due to the uncertainty in the estimation process as a result of the nature of the estimation, the use of fuzzy logic in software estimation paper is expanding. In this paper, the fuzzy logic use position is evaluated in software estimation and a new approach to software estimation is presented using fuzzy logic techniques.

Speed Control of D.C. Motor using GA tuned Fractional Complex PI_x+iyD Controller

Sachin Sharma, Omar Hanif and Gaurav Kumar

Abstract: DC motors have been employed in domestic and industrial works owing to their tendency of developing a constant torque over wide speed applications. A typical Dc motor has characterizing parameters like inertia of the rotor, friction/damping coefficient, winding resistances and inductances. The objective of a controller is to maintain the same speed with a step change in the excitation. Conventionally, Proportional Integral Derivative (PID) controller is widely used in controlling the speed of DC motor. With the use of fractional order calculus in synthesizing fractional order PID (FOPID) controller the quality of the controller and the output is increased. This paper synthesizes a

new form of FOPID controller namely complex fractional order PID (CFOPID) through Genetic Algorithm.

Automatic Garbage Collection and Dumping System – A Novel Design using Arduino and NI myRIO

Srilatha Madhunala, Hemalatha Rallapalli and Yashwanth Kumar T

Abstract: Garbage Collection and Dumping is the major part of waste management, which has become a crucial issue to be handled in order to ensure healthy environment. In traditional method, garbage bins are placed at public places to collect the garbage, which is usually collected by the garbage collection truck with the help of employed personnel and will be sent to the dumping yard to dump the collected garbage. These bins overflowed frequently before the routine maintenance takes place, which leads to bad order and unhygienic environment causing various life-costing diseases. As this problem is increasing day-by-day, an automated system for effective waste management system is desired which can collect garbage timely without human involvement is proposed and is implemented using NI myRIO, Arduino UNO and NI LabVIEW software. The proposed system consists of two main sub systems- Big Bin and small bin. Big bin moves in a regular predefined path marked as black line in regular time intervals to collect garbage from Small Bins placed in different locations. The proposed system is a novel approach and is capable to automate the entire garbage collection dumping process to ensure healthy environment.

Detecting Blackhole Attack on DSR-based Mobile Ad-Hoc Networks by Hybrid Approach

Sayed Reza Ebrahimi, Vahab Ashrafiyan and Hayman Salih Mohammed

Abstract: Characteristics of the mobile ad-hoc networks such as nodes high mobility and limited energy are regarded as the routing challenges in these networks. In a wireless mobile ad hoc network (MANET), there are no basic network devices, such as routers or access points; data transfer among nodes is realized by means of multiple hops, and rather than just serving as a single terminal, every mobile node acts as a router to establish a route. Such networks are vulnerable to routing misbehavior, due to black hole attacks. Black hole disrupts communication, or even makes it impossible in some cases. Black hole detection systems aim at removing this vulnerability. For this purpose, in this paper two phase method, discovering black hole attack using the proposed ant colony and hop count by table Reply Safe nodes to defense against black hole attack in a MANET with DSR routing protocol. In this paper the proposed algorithm is implemented in NS-2 environment (simulator) and is compared with other defense against attack algorithm. The results showed that the proposed method was effective than to previous works. Also Simulation result show that the proposed scheme outperform other ones in term of packet delivery rate, loss packets, and throughput.

New Switch Ladder Topology for Five Phase Multilevel Inverter Fed Five Phase Induction Motor

D. Raja and G. Ravi

Abstract: A five phase induction motor is modeled in the MATLAB simulink and a New Five Phase Multilevel Inverter is presented for the 5- ϕ IM to generate a maximum output voltage levels. In this topology symmetric and asymmetric source are considered and the output levels are analysed. An

asymmetric source gives higher output voltage with lesser inverter switches. Percentage Total Harmonic Distortion in the output voltage of five phase multilevel inverter fed 5- ϕ IM and the corresponding dynamic performance are investigated. The results of this topology are found better when compared to that of VSI fed induction motor. The Simulation results of multilevel inverter fed 5- ϕ IM shows the effectiveness of the proposed topology.

Variable Speed Direct Torque Control of Switched Reluctance Motor for EV Application

Parth Purohity, Prathamesh Bawkary and Pranav Murthy

Abstract: Switched Reluctance Motor (SRM) has a simple and rugged structure without permanent magnets hence low cost of production and maintenance. This makes the motor most suitable for traction applications in Electric Vehicles (EV) and Hybrid Electric Vehicles (HEV). However, these merits are a bit shadowed by its inherent high torque ripple, acoustic noise and difficulty to control. The proposed controller attempts to achieve a reduction in torque ripple so that SRM can be suited for electric vehicle application. Drive operates by using asymmetric half bridge converter for energizing each phase sequentially. This operation is performed typically by a current controller which causes ripples in torque. With the use of modern electronic switches, this problem can be tackled by proper control strategy such as the direct torque controller (DTC). The proposed controller and control strategy reduces torque ripple while providing control over speed of the motor and this makes SRM a better choice for EV and HEV applications.

Study of Fading at 2.4 GHz WLAN in Tree and Foliage Environment

Amit Mukhopadhyay and Jyoti Prasad Singha Thakur

Abstract: Fading characteristics and shadowing effects for outdoor propagation channel models for IEEE 802.11b/g WLAN using Wi-Fi operating at ISM Band frequency of 2.4 GHz is characterized in this study. This work is intended to characterize some special outdoor propagation environments to determine fading characteristics and shadowing effects on propagation by considering the effects of Tree and Foliage Attenuation Factor (TFAF) on the environment. Measurements conducted in commonly found scenarios, where the terrain is full of trees and foliage. Thus, the propagation environment becomes Quasi Line-of-Sight (QLOS). The study determines the statistical distribution to fit the propagation effects caused by trees derived from stationary measurements. The path-loss exponent for different QLOS environments is obtained, hence the empirical path-loss are found out and compared against the statically measured path-loss. Kolmogorov-Smirnov (KS) and Chi-square goodness-of-fit test are incorporated to identify the distribution followed in our work. This study will also help to deploy Wi-Fi in a QLOS environment, which is having considerable RF signal attenuation in a WLAN due to TFAF.

A Knowledge based Approach to Analyze the Sentiment of Online Reviews

Alok Ranjan Pal, Yogesh Kumar Mishra, Soumen Maji, Subhapriya Sen and Partha Pratim Manna

Abstract: In this paper, we are going to present a work which resolves the sentiment of the online reviews. In this work, first the online reviews about several entities are collected from the internet using a crawler program. Next, the sentiment of individual review is resolved using two algorithms.

First one is the Lexical Similarity based approach and second algorithm is based on Context Expansion strategy. Contexts of the reviews are expanded with the help of English WordNet. The algorithms are tested on online reviews of 15 entities from 5 different domains. The lexical similarity based algorithm produced 62% accuracy w.r.t. human judgment and context expansion based algorithm produced 82% accuracy w.r.t. human judgment. The challenges which are faced during the experiment are discussed in the pre-conclusion section.

A Lossless Secret Image Sharing Scheme based On Bit Sharing Visual Cryptography

Kanusu Srinivasa Rao and Mandapati Sridhar

Abstract: Visual Cryptography is a technique to share the secret information in the images for achieving data/information security. The technique uses encryption and decryption techniques for protecting the data. The secret image is encrypted into number of shares and distributed to the multiple participants. In decryption, the secret image can be reconstructed by combining the subset of the shares using simple computations. In the proposed secret image sharing technique, secret image is partitioned or divided into four shares based on the bit sharing approach. These shares are then covered with different cover images before distributing to the participants. All four shares are required to reconstruct the original secret image.

Harmonic Minimization in Cascade Multilevel Inverters using: Ga-Iwd, Comparative Study

Akash Tyagi and Asif Iqbal

Abstract: In this paper, a Swarm- based nature inspired optimization technique is proposed to compute the switching angles at fundamental frequency by solving the non-linear transcendental equations (also known as Selective Harmonic Elimination equations), thereby reducing certain lower order dominant harmonics and also control the magnitude of the output voltage and its comparison with the Genetic Optimization Technique. The above-proposed methods have been applied to 11-level Cascade inverter to eliminate the predominant lower order harmonics to reduce the Total Harmonic Distortion.

Selected Studies of Sediment Tracking in Mixed and Gravel Beaches using RFID Technology – A Review

Dr. M. Periyasamy, Dr. G. Mahendran, Dr. R. Dhanasekaran and Dr. M. Senthilkumar

Abstract: Coastal erosion is one of the key environment issues which affects living space for human beings as well as it had greater impact on the tourism industry. Several studies have been carried out to protect the sea shores and beaches from heavy storms and high energy waves. One of the possible ways to prevent coastal erosion is to have gravel beaches or cobble beaches which provides better stability and protection against high energy events. Even though they are providing good protection, best solution can be arrived by understanding morphodynamics of the beach. Sediment tracking is one of the possible methods to analyse the morphodynamics of the beach concerned. There are several methods exists for sediment tracking. Of them, most reliable and cost effective technique is, to track the sediment by using Radio Frequency Identification (RFID) technology. Natural or Artificial pebbles are tagged with RFID tags and they were released on the several regions of the beach under study. After certain period of time, pebbles were tracked with the help of RFID reader along with laptop or

palmtop. From the displacement of the pebbles in the study region, it is possible to understand the coastal dynamics of the shoreline concerned. This paper reviews the several scientific studies undertaken with regard to sediment tracking with the help of RFID technology.

Text Segmentation and Recognition Techniques in Image Email Detection: An Analysis

Mallikka Rajalingam and Dr. M. Balamurugan

Abstract: Spam mails act as a big threat to communication security as it leads to phishing or virus attacks that could harm the user accounts and the organizations by exposing confidential information. With these inferences, the present research attempted to accurately detect image spam e-mails which have always been a topic of great research in data security. Detection of image spam mails is divided into two separate components- character segmentation and character recognition. While the former segments individual characters, the latter overcomes the issue of blocked texts and not well surveyed. The final phase of the work is a complete image spam detection system with the two proposed works built to detect spam messages. A large number of techniques have been proposed to address this problem and the purpose of this paper is to review several algorithms, discuss benchmark data and performance evaluation and to point out promising directions for future work.

A Survey of Social Spider Optimization Algorithm: An Application Perspective

Saravanan R and Pothula Sujatha

Abstract: Over the last decade, Swarm intelligence (SI) becomes more popular and is commonly employed to solve several real time optimization problems. Numerous SI algorithms have been developed based on the collective nature of social insects or animals and Social Spider (SS) algorithm is the recently developed SI technique which uses the foraging nature of social spider. SS algorithm is used in several application areas like electrical engineering, clustering, images processing applications, etc. Though SS algorithm is utilized to solve various problems, none of the paper provides a detailed review about the application perspective of SS algorithm. This paper reviews diverse forms of SS algorithm in the view of application criteria. The existing techniques are reviewed based on the objective, methodology, application, merits and so on. A comparison of reviewed techniques is also made on the basis of domain type, problem handled, aim, algorithm used, compared algorithms and benchmarked functions.

Evaluation of Power System Stability using Voltage Proximity Index

Chaithra A and Mrs. Sangeeta Modi

Abstract: This paper discusses the concept of performance indices used for evaluating the power system stability. These indices are helpful in determining an early vulnerable condition of the bus due to various perturbations such as sudden increase in load, line tripping. Among various indices, it was found that Voltage Collapse Proximity Index (VCPI) is one of the simplest and fastest indices to predict the propinquity of the collapse. This index can be used for both offline studies as well as for online implementation. It requires only modest amount of calculations with few parameters of the power system such as voltage and admittance values and hence it requires less time for its

computation. In this paper an IEEE 14-bus system is considered and VCPI is calculated. From the results obtained it is seen that Voltage Collapse Proximity Index is an efficient tool in determining the steady state and dynamic state stability of the buses and thus ensuring the security of the system.

Voltage Stability Impact Analysis of Wind based Distributed Generation System

Namra Joshi and Dr. Pragya Nema

Abstract: In the recent years the power demand is incidentally increased. To meet this demand & with the concern with the depletion of conventional sources of energy, Many countries are looking towards renewable energy as an alternative source which is inexhaustible. Renewable sources like Solar, Wind, Tidal, and Geothermal etc. are sustainable; economically viable & nonpolluting. The cost of wind power generation is decreasing day by day so government of India has also taken initiatives to start new wind power projects & operate them in conjunction with the existing conventional fuels based plant. As wind is having random nature it affects the stability of the system especially Voltage Stability. An attempt is made to identify the impact of integration of wind power into grid on voltage stability.

CCN- based Congestion Control Mechanism in Dynamic Networks

K.Rangaswamy and Dr. C.Rajabhusanam

Abstract: The router's buffer accommodates transient packets to guarantee that the network's links do not become idle. However, buffer overflow causes packet loss, which is a signal of congestion. In content centric networking (CCN), the interest packet, which is used for requesting content, may be dropped due to such congestion. Each interest packet is assigned a specific lifetime, and when the lifetime expires without obtaining the requested content, the consumer needs to resend the Interest. However, waiting for the expiration of an Interest's lifetime for retransmission is only appropriate for best effort traffic rather than services that are delay sensitive. In order to provide delay sensitive application with better quality of service, we propose a congestion control mechanism for CCN, in which, we prevent congestion before it happens through monitoring buffer size. Upon reaching the buffer threshold, the node notifies its downstream node. On receiving the notification, the downstream node adjusts traffic rate by allocating new incoming Interests to other face(s). However, when the downstream node fails to reduce traffic rate, the same procedure continues until the consumer node reduces sending rate. The simulation results show that the proposed mechanism is capable of significant performance improvements, with higher throughput.

A study on Mutual Coupling Coefficient Reduction between Four Port MIMO Microstrip Antenna

Shiddanagouda.F.B, Dr.P.V.Hunagunad and Dr. Vani.R.M

Abstract: This paper compares the performance of four port Multiple Input Multiple Output (MIMO) microstrip antenna using Defected Ground Structures. The conventional four port MIMO microstrip antenna is resonating at 5.9 GHz and producing bandwidth and mutual coupling coefficient equal to 223.1MHz and -20.9dB. The proposed MIMO microstrip antenna is operated dual resonant frequencies 2.5GHz and 5.1GHz respectively. The proposed MIMO antenna first resonating frequency producing bandwidth and mutual coupling coefficient are equal to 75.9MHz and -29.7dB, and second resonating frequency producing bandwidth and mutual coupling coefficient are equal to 277MHz and -18.90dB. The proposed MIMO microstrip antenna is better than conventional MIMO antenna interns of

bandwidth, data rate and mutual coupling coefficient. The MIMO antenna are designed using ANSYS HFSS software. Details of the antenna design and results are presented and discussed.

Design and Implementation of AES using FPGA

Mohamed I.Shujaa and Zulfikar A. Hussein

Abstract: Due to the quick advancements in the personal communications systems and wireless communications, giving data security has turned into a more essential subject. This security idea turns into a more confounded subject when nextgeneration system requirements and constant calculation speed are considered in real-time. Advanced Encryption Standard (AES), a Federal Information Processing Standard (FIPS), is an approved cryptographic algorithm that can be used to protect electronic data. The AES can be implemented in software or hardware. However AES are implemented on hardware. Because hardware implementation satisfy speed, throughput and security requirements of the complex communication systems which are used in modern applications. The design of AES is configured on a Xilinx Spartan-3AN FPGA starter kit where the results have been displayed on the Liquid Crystal Display (LCD).

Modeling & Simulation of Transient Response of a Armature-Controlled Direct Current Motor using MATLAB/SIMULINK

Suresh H L, Narendra Chaulagain, Darshan H S and Yashaswi K

Abstract: In this paper the experimental implementation of a a separately excited DC motor are presented. The models of speed control of the DC motor are implemented in MATLAB/SIMULINK. Simulation can be very helpful for motor behaviour under different operating conditions which are helpful in designing more advanced protective devices precautionary equipments., For simulation of motor, some data is also required like torque constant which is obtained by experimental investigations. Output is varying corresponding to change in input variable. The input variables are armature current, filed resistance and armature voltage. By testing of actual motor simulating and modelling we will get our required output.

Motion Detection in Video using Content based Retrieval

Sudhakar Putheti and Mohan Krishna Kotha

Abstract: One of the challenges faced in video retrieval is to accurately detect the objects in motion. The features of the moving objects from the input query clip are extracted and compared with the features of the objects present in the videos stored in the database. If the similarity of the features is matched up to the threshold level, then it indicates the objects are similar. This paper proposes a technique to detect the moving objects in the videos and in order to detect the objects an abstract difference technique is used. This technique is followed by noise filtering.

Real Time FPGA based Ethernet Control Communication for Robotic Arm by using Raspberry Pi

Dr. P .C. Bhaskar and Anuja Jayram Waingankar

Abstract: In this paper, an approach for real time control communication using Ethernet is proposed. The strategy to support this at the network level .And include Field Programmable Gate Array (FPGA)

implementation on the Ethernet platform for robotic arm. An embedded Ethernet controller is designed to send data packet via Ethernet Local Area Network (LAN) to destination. The transferring data also includes various platforms as the medium of communication between FPGA board and the robotic arm. Many researcher's used Arduino as a controller and the results of time delay for Ethernet communication was considered to decide the better platform for communication. In this paper the RaspberryPi considered for the result of the average data packet delay between Raspberry-Pi and FPGA board is lower in comparison to Arduino board.

Home Automation Using Panoramic Image Using IoT

Dr.(Mrs.)Nupur Giri, Chetan Gupta, Mohit Choithwani, Prasanna Biswas and Piyush Gidwani

Abstract: In this era of modernization where the electronics devices are becoming cheaper, we felt that there is a need of combining IOT with the non-IT sectors (like in business or in common man's lifestyle). It will not only automate and ease the use of technology to common man but it will also make them aware about the usage of the appliances .Technology had to catch up to ideas and the phrase Smart Home finally came around in 1984 . Home Automation can be described as controlling the household appliances using smart technologies. The basic aim of this Home automation paper is to use smartphone to control different electrical appliances using panoramic image of your home or any place where you want to control different electrical appliances. Panoramic image implies the 360 view of your home, such that it cover almost every appliance of that place.

Detection and Extraction of Abnormality from BrainMRI Image Using Extended Fuzzy-C-Means Clustering Algorithm

Ranjita Chowdhury, Samarpan Dutta, Pinaki Saha and Diptak Banerjee

Abstract: Computerized automated detection of brain disorders is complex as it heavily depends upon the imaging technique, shape and size of the brain and resolution of the image. In this paper we are going to give an efficient algorithm to detect and extract abnormality from brain MRI using Extended-FCM and Densitybased clustering technique which perfectly separates out the abnormal lesion with lesser number of input parameters required. Our all new extended-FCM proves to be efficient here, as in 91% of the cases it gives clustered output having high Silhouette index in lesser number of iterations. This approach will facilitate automated detection of brain diseases in rural and remote areas.

Improved Variance K Means Algorithm using Multi Objective Genetic Algorithm for Validate Cluster Generation

Ankur Saxena, Nikhlesh Pathik and Rajeev Gupta

Abstract: In past decade, several methods have been introduced to identify the solutions of multiple clustering. Arrangement of these strategies is chiefly in view of the examination of genuine information space, space nature transformation, and sub-space projections. In this paper, an improved k-means Multi Objective Genetic Algorithm(MOGA) is proposed for detecting a generic optimal separation of the given heterogeneous numeral and categorical data within a clearly identified number of clusters. Proposed method integrates the genetic algorithm within the k-means algorithm with improved cost function to manage the numeral data. For the effective evaluation of the proposed algorithm three original datasets are used from UCI largest dataset repository center. Experimental result shows the

effectiveness of the proposed algorithm in regaining the unexpressed cluster designs from categorical dataset if such designs alive. Improved illustration for cluster center is used which can draw cluster behavior with effectiveness because it carries the distribution of all the unreserved values in Cluster. Comparative analysis showed the superiority of proposed algorithm over VK-means algorithm.

Virtual Walk-through of Stitched Image using Cylindrical Projection

Christi T. Pereira and Sujata P. Deshmukh

Abstract: Virtual tour can be created through video tour, walkthrough or flyover depending on application or things that users want to simulate in virtual world. A video tour provides full 360 degrees motion video of a site. But size of video, consumes more bandwidth to download it, long download time, need of specific software, resolution and compatibility issues, are limitation of video tour. So, the aim of this project is to create virtual walkthrough to simulate the experience of moving through space by avoiding the limitation of video tour. In this project, virtual walkthrough is created using collection of images that are played in sequence to give panoramic view like a moving video. It is intended to give cylindrical view, like 360-degree view of the presented site. This virtual walkthrough based on real-world taking pictures typically do not require the high-end equipment's. This system uses image stitching concepts in which set of images of presented site of view are integrated together to get outcome in a panoramic image. Further stitched panoramic image is used to create virtual walkthrough. So, this project is divided into two phases, in first phase image are stitched using Scale Invariant Feature Transform method proposed by David Lowe, 1999 and in the second phase the realistic walk through from stitched image is rendered by using single viewpoint central projection. The first phase scene images undergo through 3 stages. First stage is the image enhancement which is to enhance features of images. In second Stage, image registration using SIFT method is used to bring out specific features of images. Further, in third stage, selection of optimal feature and image blending techniques are used. And finally, in second phase virtual walk through of stitched image is rendered. Limitation of this approach, scene motion like object moving in and out while capturing can result in bad stitching. As compared with video tour, the virtual walkthrough tour through image, significantly reduce the size from MB to KBs still providing the same view as video. Thus, it is providing better quality realistic walk through with less memory utilization. So, this Virtual Walkthrough can address a fundamental need within online selling web sites of e-commerce domain or the property industry. It provides a tool to connect buyers and with online sites to view products or things really like by presenting 360 degrees view. Further it can be used to enhance buying experience by providing the walkthrough to the buyers on social media, mobile devices and over email.

An Advance Tree Adaptive Data Classification for the Diabetes Disease Prediction

Rukhsar Syed, Rajeev Kumar Gupta and Nikhlesh Pathik

Abstract: Data mining is one of the emerging area in the field of computer science it's enable to deal with large dataset with different characteristic. In the current scenario it is used in every field like Medical. Education, Agriculture etc., but in the past few decades use of data mining approaches is increasing exponentially because it required prediction based on data for quick decision. Sometimes it is very challenging to predict accurately on large study data. Classification and observing them is one of the proper solution which driven by algorithms. In this paper a proposed algorithm is given which take advantage of partitioning based on tree, further working with adaptive SVM approach for

classification. The proposed architecture used pre-processing under sampling SMORT which enable in pruning the data. The approach is experimented using the Weka tool on diabetic dataset and compared with traditional tree based RF, RT and J48 Approach. The observed outcome shows the efficiency of proposed algorithm over the traditional solution of processing diabetic data and finding efficient classification from it.

Using Source Side Channel Engineering on Junctionless Transistor for Improved Analog Performance

Avinash Kranti, Rahul Shandilya and Gaurav Saini

Abstract: This manuscript, investigate the performance of junctionless transistor by using source side channel engineering for improved analog performance. A source side ptype ($5 \times 10^{18} \text{ cm}^{-3}$) pocket in Buried Oxide Layer (BOX) is used to enhance the performance of the conventional JLT device. The use of the pocket in JLT device increases the transport of electron from source region to channel region due to a steep rise in electrostatic potential compared with conventional JLT. The proposed JLT device with high-k spacer shows notable improvement in the short channel effects compared with its conventional counter parts. The proposed JLT structure also shows splendid improvements in analog performance metrics such as trans-conductance (gm), gate capacitance (C_{gg}) and Gain of the device (A_v) compared with conventional JLT structure.

A Novel Grey Wolves Optimization Method for Mobile Robot Navigation

Mohd. Nayab Zafar and J. C. Mohanta

Abstract: This paper presents a novel knowledge based Grey Wolves Optimization (GWO) method for path planning and target tracking behavior for mobile robot in an obstacle prone environment. Grey Wolf Optimization is a population based meta-heuristic algorithm which mimics the leadership hierarchy and hunting mechanism of Grey Wolves. Mathematical modelling of the behavior of the wolves has led to the development of this algorithm. In the current work the Grey Wolf Optimization (GWO) technique is used as a tool to implement the target-seeking feature and later on integrated it with obstacle avoidance algorithm. The effectiveness of the developed algorithm was initially simulated in MATLAB and its effectiveness was verified in various environments. The path lengths and heading angles were calculated for each environment were presented and compared with the simulation results. The simulation results reveals that the developed GWO based path planning strategy/methodology is not only capable of reaching the target but also find an optimal or near-optimal robot path in complex obstacle present environments.

I-V Characteristics Analysis of Carbon Nanotube Field Effect Transistors and Graphene Nanoribbon Field Effect Transistor

Anjana Kumari, Suman Rani and Suman Rani

Abstract: The demand for high-speed processors has made scaling of the transistor a major stimulating factor, as the scaling of Silicon-based technology is moving towards its fundamental limit by 2018 according to International Technology Roadmap for Semiconductors (ITRS) roadmap. Carbon Nanotube Field Effect Transistors (CNTFET) and Graphene Nanoribbon Field Effect Transistor (GNRFET) are the most favorable Nano-scaled devices for fulfilling the extraordinary presentation, very compressed and little power circuits in now a day. In this paper, the current-voltage

features of CNTFET and GNRFET are deliberated by using NEGF (Non-Equilibrium Green's function formalism) approach through the self-consistent born estimate. The CNTFET and GNRFET simulations are carried out using Nano T-CAD ViDES. The simulation demonstrations the current-voltage features and transmission coefficient versus Z of CNT for both CNTFET and GNRFET. The ION/IOFF ratio is higher for CNTFET as in order of than GNRFET which is in order of These investigations are appropriate to simple and composite digital and analog circuit designs.

Packet Collision Minimization in Sensor Networks by using Cooperative Routing Algorithm and Power Assignment

Ms. K. Satya and A. Sai Suneel

Abstract: In this paper we study the impact of cooperative routing for maximizing the network life time in sensor network application. Cooperative routing in wireless network has gained much interest due to its ability to exploit the broadcast nature of the wireless medium in designing power efficient routing algorithm. Recently, merits of cooperative communication in physical layer have been explored. We develop a collision minimization algorithm in cooperative transmission, optimal power allocation, and route selection. Most of the existing cooperative routing algorithms are designed to reduce the energy consumption, and also reduce the computational complexity. The simulation results reveal that the presented algorithm can significantly reduce the collision probability compared with the existing scheme.

A Data Mining Framework with Machine Learning for HealthCare Analysis using WEKA

Prof. Sujeet More and Prof. Aslam Karjagi

Abstract: As the volume of data is increasing day by day, the big data term is becoming more popular in internet world. Due to the advancement in Electronics Health Records (EHR), generating more health data for advanced health analysis. However due to heterogeneous and unstructured data from EHR, data analysis is facing big challenge. In this paper we will review the various research efforts made in healthcare domain. We define a more advanced proposed system, to analyze the volume of data using different data mining techniques, and predict the accurate data, using machine learning and securely store it in cloud.

Implementation of Kogge-Stone Adder using FinFET Technology

Nikhil Matkar, Nikhil Matkar, Mandar Gadekar, Siddhesh Jagushte and Dr. Sangeeta Joshi

Abstract: Adders are most useful circuits for processor and microcontroller designs such as multipliers, shifters and other complex VLSI applications. Kogge-Stone adder (KSA) is a parallel prefix form of Carry Look-ahead Adder (CLA). It is widely considered as the fastest adder and also used for high performance arithmetic circuits. This paper illustrates implementation of Kogge-Stone adder (KSA) using 18nm FinFET technology. FinFET offers benefits in many dimensions such as significantly improved power and performance metrics and lesser short channel effects than in bulk CMOS below 22nm technology. Power dissipation and delay are major performance metrics of digital applications. In this paper comparative study of major performance metrics of 8bit KSA and 8bit Carry Look-ahead Adder (CLA) is performed in Cadence Virtuoso simulation tool using 18nm gate

length FinFET technology. It is observed that 8bit KSA results in enhanced major performance metrics using 18nm FinFET technology.

A Modified Indirect Current Control Algorithm for Power Quality Improvement using a New Hybrid PV-DSTATCOM

Soumya Mishra, Pravat Kumar Ray and Asini Kumar Baliarsingh

Abstract: A modified indirect control algorithm is presented in this paper to improve the operation of photovoltaic fed distributed static compensator. This new algorithm overcomes the limitations of direct current control algorithm under non-ideal supply voltage conditions such as switching notches in source current after compensation, distortions in the reference source current and poor harmonic elimination. The design and performance testing of the presented system has been carried out in MATLAB/Simulink software. Furthermore, the efficacy and robustness of the presented system are validated through experiment.

MQTT based Tracking System of Multiple Mobile Devices and Sensors

Beena M. Patel, Beena M. Patel and Rachana V. Modi

Abstract: Dreaming on the tremendous potential in developing smarter mobile devices has lead the world towards the golden era of Android Operating System and approximately over two billion users have been witness during the last decade. Throughout this duration, such mobile technology has played vital role to facilitate the internet and other respective benefits to reach each and every individual throughout the globe. As the result, the use of Internet and hence consumption of data has been increased drastically and demanding more and more day by day. No matter whatever we will develop in Mobile Broadband Internet, we will be always in short of supply. The future is demanding to initiate the precise as well concise solution of network traffic. Also as per current demand, tracking of devices and people are also a future requiremnt i.e if small kids studying in long distance schools in metro city then for parents it is require that their kids are away in school but within a safe circle and they (kids) are as per their device location. so if Message Queuing Telemetry Transport moreover known as MQTT would be the eventual solution in the same direction to handle conventionally used Hypertext Transfer Protocol based request/response using client-server computing model. This lightweight messaging protocol can be used to establish connectivity and data sharing between multiple clients as well as between client and server with low internet bandwidth.

Optimization of Multi Objective Load Frequency Control using Cuckoo Search Algorithm

P. Praveena, Basavareddy and Dr. Soumya Mishra

Abstract: The present work emphasis on multi-objective frequency controller to regulate operating frequency by controlling the governor settings. Goal of PID controller is to retain the frequency deviation within bounds in a short span of time period, since interconnected power system has many frequency dependant loads. However, the proposed controller design also aimed at minimum peak overshoot, shortest settling time and stability of system. A multi objective function was considered by confining these dynamic response specifications. Optimization of multi-objective function was carried with the aid of soft computing methodologies. Superiority of multi-objective function was tested by

generating different test cases using Cuckoo Search optimization (CS) algorithm. The proposed multiobjective function performs better and reasonably maintains good equilibrium between frequency changes and transient oscillations.

Solid State Smart Reactor for Fault Current Limiting

Vinita Kare

Abstract: This paper proposes a solid state smart reactor for restricting the fault current. It utilizes a couple of TRIACs and works in AC mode. Proposed topology utilizes TRIAC alongside the arrangement reactor. The reactor is skirted amid ordinary condition and changes to AC mode amid fault condition. Favourable position of proposed AC reactor write FCL over existing fault current limiter (FCL) is that the quantity of electronic switches is diminished in this model. It is a smart reactor which detects the fault naturally and acts accordingly. Additionally, the impedance given by the reactor amid ordinary condition is zero and that amid fault condition is expanded. MATLAB/Simulink programming is utilize to depict the execution of the proposed smart reactor.

Impacts of DG Optimal Location on Voltage Profile and Transmission Line Loading

Samikshya, Srinivasulu G and Balakrishna P

Due to increased load demand in presence of limited and incompetent generation capacity, the power system networks of several developing countries face consequences like congestion. Also, the presence of competitive market scenario propels this situation of congestion to further severity. It colossally affects the health of transmission lines and hence the stability of power industry. Researchers through their researches and works have proposed many techniques that aim at relieving congestion of transmission lines. This paper aims at analyzing the effects of DG installation on congestion relief in the transmission systems by considering two parameters, congestion factor, and transmission deviation. The proposed approach is tested on a 6-bus system and its simulations are carried out using Power World Simulator. The DG's performance is analyzed when working with different capacities and ultimately one bus is determined which serves as the best location for the placement of the DG.

Railway Automation Systems Diagnosis based on Bayesian Method

Waldemar Nowakowski, Piotr Bojarczak and Zbigniew Lukaszik

Abstract: The basic function of railway automation systems is allowing a safe and fluent railway traffic control. Along with the technical progress these systems are constantly being improved. The process of their development at the moment is influenced by the modern information technology, that is why the contemporary railway automation systems are computer systems. They allow a remote control of the railway traffic on many train service stations from one place, which is Operation Control Centre (OCC). This subject is also related to the centralization of the railway automation systems technical diagnosis in Maintenance and Diagnostics Centres (MDC). Despite the constant technical progress, there are no standards concerning the way and range of gathering diagnostic data and the method of its analysis. The authors of the article have noticed this important issue and have decided to make an attempt to formulate and develop a method of railway automation systems diagnosis. The

method proposed in the article can be counted as logic diagnosis and one of the Bayesian methods. A verification of the method has been performed on the example of a Level Crossing Protection System (LCPS). The obtained positive effects are an encouragement for further research and consideration of other types of railway automation systems.

Masked Neural Style Transfer using Convolutional Neural Networks

Arushi Handa, Prerna Garg and Dr. Vijay Khare

Abstract: In painting, humans can draw an interrelation between the style and the content of a given image in order to enhance visual experiences. Deep neural networks like convolutional neural networks are being used to draw a satisfying conclusion of this problem of neural style transfer due to their exceptional results in the key areas of visual perceptions such as object detection and face recognition. In this study, along with style transfer on whole image it is also outlined how transfer of style can be performed only on the specific parts of the content image which is accomplished by using masks. The style is transferred in a way that there is a least amount of loss to the content image i.e., semantics of the image is preserved.

IoT based Real-Time Remote Patient Monitoring System

Sagar S. Bachhav and Dr. Nilkanth B. Chopade

As increase in the development of technology, Internet of Things (IoT) refers to the interconnection of all objects and it has been recognized as the next technical revolution. IoT refers in many commercial fields. Some of these are smart parking, smart home, smart city, smart environment, industrial places, agriculture fields and also in medical domain. One of such application in health monitoring domain is to monitor the status of different patients. Internet of Things makes medical equipments more efficient by allowing real time monitoring of patients health. This includes sensors which capture all the data related to patient. The proposed system helps to reduce human error in health monitoring process. In Internet of Things, different health parameters of patient get transmitted from medical devices via a gateway, where it is stored and analyzed. The significant challenges in the implementation of Internet of Things for healthcare applications are monitoring data of all patients from various places at one destination. Internet of Things plays vital role for bringing out best solution to provide an effective patient monitoring at low cost and this will reduce the trade off between patient outcome and disease management for health monitoring in the medical field. In this system, we monitor heart pulse rate, temperature and accelerometer position on Raspberry Pi platform. From Raspberry Pi, we can send this acquired data to cloud where real time monitoring and analysis of this data can be done and can be received on any device at remote end.

Design and Simulation of CAD Tools for Early Detection of Glaucoma

Divya shree s and Subarna Chatterjee

Abstract: Glaucoma is a chronic eye disease caused due to damage of the optic nerve head that carries visual information to brain and is caused to pressure variations in eye and is the second most leading cause of permanent blindness globally among the other ocular diseases such as diabetic retinopathy, macular degeneration etc. Early detection of glaucoma is of utmost concern since by detecting glaucoma in early stage can be treated to slow down the progress of glaucoma but it cannot be cured.

Thus there is a great need to design and develop Computer Aided Diagnostic (CAD) tools that assist the physician in detecting the glaucoma at early stages. The proposed diagnosis technique consists of three parts. Firstly proposed a technique for segmenting the region of interest, secondly measure some shape parameter for statistical analysis and lastly classify the glaucoma using Support vector machine classifier. In this paper the proposed algorithm and also the graphical user interface (GUI) of CAD tools is simulated in MATLAB.

ECG Signal Measurement and Validation of Wearable Sensing Multi-Parameter Module

G H Soumya, Rajashekar Kunabeva, Vinutha L B and Balu Vasista

Abstract: ECG plays vital role in diagnosing the cardio vascular diseases (CVD). Proprietary APCOG Multi-Parameter Module (MPM) has been used for ECG signal acquisition. The board was tested and validated for accurate data acquisition for ECG circuit on the board. The validation was carried out by passing two sources of ECG signal through MPM module, the output signal features were extracted and compared with source properties. The board was tested for 5 normal ECG signals generated from ECG simulator and 1 ECG signal from normal subject acquired using MPM module. The accuracy of functional performance of ECG circuit was then tested with feature extraction (HR, Ramp and Std.deviation) and passing through different classifiers. It was observed that the features of all the output signals of MPM module matched with that of input signal. The highest accuracy was achieved by SVM classifier in testing phase for record 143 produced using ECG simulator with an accuracy of 91.33%.

Fingerprint Classification with Reduced Penetration Rate using Convolutional Neural Network and DeepLearning

Sheena S. and Sheena Mathew

Abstract: Biometric fingerprint feature extraction is a complex process, but it can be simplified by using many applications. When dealing with poor quality fingerprint images the performance of the traditional minutiae detection algorithm found to be deteriorated. Recognizing the fingerprint in a fast and flexible method is hot research topics in these days because of the matured fingerprint identification technology and the massive fingerprint database. This paper mostly focused on fingerprint classification using convolutional neural networks which excludes the need of specific feature extraction process. In such situation, this method proved to predict a class even with poor quality fingerprint image that are commonly rejected by most of the algorithm. This study also gone through to minimize the penetration rate in the database. Various plots of our work shows good accuracy rate and better penetration rate.

Increasing the Effectiveness of Time of Use pricing using Optimization Technique: A Case Study of HT Industry in Gujarat

Varada J. Tambe and S. K. Joshi

Abstract: Under the Time of Use Tariff mechanism, the High Tension Industrial consumers of Gujarat state are granted Night Rebate since more than a decade. The paper portrays the optimum condition for availing maximum night rebate under the constraint criterion of maintaining the Open Access drawal and limiting the maximum demand as per the contracted load and resulted reduction in

electricity billing rate. Paper also portrays commercial consumers as upcoming category for availing this benefit.

A Theoretical Approach for Privacy Preserving Location based K-Anonymity

Y.Lakshmi Prasanna and E.Madhusudhana Reddy

Abstract: In LBS, providing privacy to the user's location information is a major concern. Location Privacy is an emerging area where a lot of research is being carried out focusing on the anonymous location information. K-anonymization is a traditional and popular privacy preserving technique that generates Cloaked Region (CR) where the query issuer cannot be distinguished among the k-1 other users in the CR. Cloaking is a technique which blurs the user location into a Cloaked Region (CR) that satisfies the privacy parameter specified by the user at query time. This paper provides a method for generating best minimized cloaked region for transfer of the data between the users. By updating the trajectory and location information of the users, Location Privacy can be further improved.

Hilbert Huang Transform and Type-1 fuzzy based Recognition and Classification of Power Signal Disturbances

Rahul, Rajiv Kapoor and M M Tripathi

Abstract: this paper deals with hybrid recognition method and classification technique based on Hilbert-Huang transform (HHT) and support vector machine to enhance the accurate delivery and assure efficient recognition of power quality events in the electrical systems. An authentic and quick disturbance recognition method which is the base of power quality control is mandatory. To accomplish this power quality disturbance issue, a Hilbert-Huang transform based method is presented here. Hilbert-Huang transform is an advanced signal processing technique that can be used in the study of non-linear and nonstationary signals. In the proposed technique, the synthetically generated power quality events are breaking into Hilbert-Huang transform components, referred as empirical mode decomposition and intrinsic mode components. A decomposition action and features separation using Empirical Mode Decomposition (EMD) is conducted for non-stationary power quality disturbances into Intrinsic Mode Functions (IMFs). These components play important role in the calculation of the frequency and amplitude of power quality events. On the bases of these features, fuzzy rules are designed and classification of power quality disturbances performed. The performance evaluation based on simulations results shows that the proposed method has better accuracy and validity for power quality disturbance monitoring in electrical systems.

Stiff Frame Encryption using Compression

Ramesh Makala, Gowtham Mamidiseti and Hemantha Kumar Budithi

Abstract: This paper introduces a new encryption mechanism implemented over lossless data compression mechanisms. Our approach is applied to ASCII data and is implemented in two phases that are applied on independent frames of size nine bytes extracted from the input data. First phase implements compression, and second phase does compression as well as encryption. Each phase reduces one byte in frames, thereby resulting in two bytes reduction per each frame. Experimental results reveal that it achieves better compression ratios and also encrypts data with better key sizes. The proposed method is very economical and speedy method of doing compression and encryption at the same time of scanning input data.

Simulative Investigation of Ireless Sensor Network with the Deployment of Different Number of Nodes

Ravneet kaur, Dr Parveen Singla and Dr. Rinkesh Mittal

Abstract: Wireless networks consists of several nodes which require individual battery or power supply for the purpose of operation. These active nodes lose their respective energy during their respective operations such as to provide communication between various nodes. So, in modern communication system, recharge and replacement of such nodes or their batteries is a challenging task due to their deployment in the remote places. Thus, to get efficient routing criteria and to increase the efficiency of WSN is a major challenging task for researchers, therefore a large number of researches have worked on the concept to increase the lifespan and efficiency of WSNs with different routing protocols. However, there are still a number of issues that require further analysis and investigation. For the purpose of sending and sensing of data, LEACH protocol is one of the widely used protocols and algorithm. The proposed algorithm or technique use cluster forming technique which is based on formation of several clusters during different events, cluster head selection, aggregation of the efficient and sensed data within desired cluster and sending that particular data to base station in a manner to maintain both energy and efficiency of system. In this paper, we analyzed the complexity of entire networks in the terms of various packet send to BS, number of dead nodes created during the operation and sum of energy of several nodes of entire network. Several experimental results are carried out to show the complexity of packets, detection of dead nodes and energy of network with different number of nodes.

Performance and Load Testing: Tools and Challenges

Rakesh Kumar Lenka, Meenu Rani Dey, Pranali Bhanse and Rabindra Kumar Barik

Abstract: Performance testing can be done on various types of the software application like mobile application, web application, web service, cloud and grid application. When we are organizing performance testing some issues could have observed related to tools such as tool installation, the flexibility of the tool in the application, tool setup and response time generated by the tool, etc. In this paper, we are going to analyze the performance of the application by using two different tools named as ApacheJmeter and another one is SoapUI. Different tools give different responses, so according to the application; we should choose the testing tool. Apache-Jmeter is a web application based performance testing tool which is useful to examine the server performance under the heavy load. Whereas SoapUI Load Testing tool verifies the Quality of Service of a specific application under the variable load.

Reduction of Accumulated Dispersion in 1Tbps Sband Long Haul DWDM Systems using ITU-653, ITU-655 and Corning Leaf Fibers

Rajandeep Singh and Maninder Lal Singh

Abstract: In this paper a method to reduce accumulated dispersion in 1Tbps S-band long haul dense wavelength division multiplexing (DWDM) systems has been presented by cascading ITU-653, ITU-655 and corning leaf fibers. With the proposed method, effective dispersion accumulation as low as -1.185 (ps/nm/km) at 1450nm, +0.01 (ps/nm/km) at 1474nm and +0.77 (ps/nm/km) at 1490nm has

been obtained. The performance for S-band 1Tbps DWDM system with 100 channels operating at 10Gbps each is evaluated for varied fiber distance. It is found that the S-band 1Tbps DWDM system performed well up to 916 km without any further dispersion compensation.

Real Time Barcode based Student Attendance System using Internet of Things (IOT)

Champaka M.D and Dr.Shivputra A

Abstract: Most instructive establishments' chairmen are worried about understudy sporadic participation. Truancies can influence understudy general scholastic execution. The ordinary technique for taking participation by calling names or marking on paper is exceptionally tedious and uncertain, thus wasteful. Standardized identification based participation framework is one of the answers for address this issue. This framework can be utilized to take participation for understudy in school, school, and college. It additionally can be utilized to take participation for specialists in working spots. Its capacity to interestingly distinguish every individual in light of their Barcode information kind of ID card make the way toward taking the participation simpler, speedier and secure when contrasted with regular technique. Understudies or specialists just need to put their ID card on the per user and they need to demonstrate their frontal face then their participation will be taken quickly. With constant clock capacity of the framework, participation taken will be more exact since the ideal opportunity for the participation taken will be recorded. The framework can be associated with the PC through RS232 or Universal Serial Bus (USB) port and store the participation taken inside database. An elective method for survey the recorded participation is by utilizing HyperTerminal programming. A model of the framework has been effectively created.

Regional Pole Placement Technique to Stabilize Cart-Inverted Pendulum system

Harish Balaga and Marrapu Deepthi

The inverted pendulum has been considered as a benchmark control problem due to its nonlinearity and stabilization around the unstable equilibrium point. To achieve stabilization, it is well known that all the closed loop system poles should lie in the left half of s-plane. In the present work, different approaches have taken to shift the system poles to the left half of the plane. With the recent development of LMIs tool, regional pole placement is well suited to achieve the goal. Here, a regional pole placement controller is synthesized, where desired specifications are transformed into LMI regions. In the present case, a conical sector of the left half plane is taken so that stabilization with better transient performance can be achieved, which is observed through both simulations as well as experiment.

Applying Descriptive and Predictive Analytics on Academic Dataset

Aanchal Phutela and Harkiran Kaur

Abstract: Data analytics play an important role in any organization, based on relevant facts that will allows making a better decision. Progression of students greatly affects the organization's future. Analysis of the academic dataset could reveal important insights, which if properly used can help students for their progression. In this paper, the authors have applied Descriptive and Predictive Analytics on the Academic dataset of students. Mainly the authors have focused on the progression of

the student's by using cube technology and cluster analysis approach. For this work, the authors have done the cube designing and fabricate 3 clusters by using k-means algorithms. These clusters placed the similar attribute in one class, on which various models have been applied for making prediction. The deep learning model has given the highest accuracy that is 99.02% in comparison to all other models such as Naïve Bayes, Decision Tree and Linear Discriminant Analysis (LDA)

Multilevel Encryption Technique to Sanitize Sensitive Data before Migrating To Cloud

Hitesh Marwaha and Rajeshwar Singh

Abstract: Cloud computing is most enticing technology in the current era of Information Technology. Cloud is not only a technology it is a service based on technology. It is an internet-based technology where the user has to pay as per usage like other general utilities. However, cloud computing is having many technological benefits still security and privacy are the major challenges that impediment the wider acceptance of cloud. In this paper, various challenges faced by the cloud are reviewed and mathematical multilevel encryption data sanitization model is proposed to sanitize the data before migrating to cloud

Interactive Scene Analysis

Suprava Patnaik, Vinaya Wate, Suraj Gaurav, Noida Fernandes and Adish Bhatkar

Abstract: This paper addresses an interactive scene analysis API. The primary contribution of this work is integration of text and object extraction. An android application has been proposed which gets instruction from user to recognize objects and extract texts present in the scene. Output can be in form of probability of an object belonging to a set of predefined classes in textual or aural version of the text. The API has been tested for images with multiple objects, texts of varying font style and orientation. The motivation of the work is to develop a user-friendly API which would be interactive and configurable for applications suitable for tourism or as assistance for visually impaired people or as a surveillance system and so on.

Dimension Analysis in No-SQL Databases

Shweta Singh and Sanchita Paul

Abstract: Today, data is generated and consumed at an extensive scale. There are huge volume of data which is so large and is hard to process using current/traditional databases and software technologies. This has led to various approaches for scalable data management defined under the term "No-SQL" data-base to handle the everincreasing data volume and demand for storage. The goal of good storage management is to ensure the availability and minimum response time. This paper shows an attempt in facing the challenge of increasing volumes of data by dimension analysis in NoSQL database-Cassandra; types of scaling, demand of NoSQL database in fulfilling Industrial needs.

Spectral Subtractive Type Algorithms for Speech Enhancement and Objective Performance Evaluation

P.Sunitha and Dr.K.Satya Prasad

Abstract: The main objective of speech enhancement algorithms is to boost the quality and/or intelligibility of the noisy speech. Among offered ways, the spectral subtraction method is that the

traditionally one of the first algorithm proposed for removing additive back ground noise. This paper presents a review on spectral domain ways like spectral subtraction algorithm, along with various modified approaches of Spectral Subtraction algorithms such as Spectral Subtraction with over subtraction factor and Multi band Spectral Subtraction, which minimizes the shortcomings of the basic method for English speech patterns in presence of different types of non-stationary Noise. These algorithms are computationally simple to implement. The performance of these methods are compared in terms of performance measure parameters like Signal to Noise Ratio (SNR), Mean Square Error (MSE) and Logarithmic Spectral Distance (LSD).

Efficient Secure Sparse Data Compression Techniques to Store Cloud

SHEIK SAIDHBI and Dr. Komati Thirupathi Rao

Abstract: Now days Data Compression is the technique through which, we can reduce the quantity of data, used to represent data without excessively reducing the originality of the content. For faster communication and exchange of data is the main problem, so most of the information comes form of the electronic data. Most of the computer applications related to banking, medical is not secure and these applications exchange lot of confidential data having different files, text, audio, video, images formats. This types of confidential data need to be stored efficiently and securely transmitted. Data compression is a method of reducing the size of the file size. So that the file should takeless space for storage. This paper we proposed one algorithm Sparse Data Compression and Decompression reduces the redundancy and if a compressed file is encrypted it is having a better security and faster transfer rate across the network than encrypting and transferring compressed file. We observe the performance of some cryptographic algorithms (AES,DES,TripleDES, RSA,RC4). We proposes with a analysis matrix for different levels of security . Therefore this work also proposes a learning compression-encryption model for identifying the files that should be compressed before encrypting the files that should be effectively give speed of the process and reduced the attacks.

Construction of Gamma Energy Spectrum Response Function Matrix in NaI Detector

Qing-ju He, Liang-quan Ge, Fei Li, Kun Sun, Zi-qiang Wen and Jian-qiang Qin

Abstract: In energy spectrum analysis, establishing accurate spectral response function plays a key role in the application of this technology. General methods are hardly to get the response function, such as calculated by using experimentally measured data or theoretical calculation. Therefore, it is necessary to use simulation software. In this paper, 43 different energy gamma spectra are simulated, and the required data are extracted by function fitting, formula calculation, etc. The mathematical laws and physical principles between the data are analyzed. The incident ray energy is the main variable, and the peak value of the full energy, the count ratio of the full energy and peak, the coefficient of the peak width of the full energy, the Compton side energy and other parameters are used as the response variables to establish an accurate single-energy gamma spectrum response matrix. It has important guiding significance for future research on the energy spectrum of NaI detector.

Security and Privacy Aspects of Mobile Cloud Computing using Quantum Cryptography

Sudhanshu Maurya and Dr. Kuntal Mukherjee

Abstract: In the current scenario, mobile cloud computing is termed as rapidly growing technology. With the development of mobile phones and success of the internet, computational resources have

become cheaper, easily accessible, ubiquitous, distributed and powerful tool for all types of organizations. Mobile cloud computing is a computational model in which services are offered on mobile phones in an on-demand fashion. Most of the service provider are concerned with privacy and security issues of cloud computing. As per customer's viewpoint, privacy, security, and protection of data are the main concern for adaptation of Cloud Computing. In this endeavor, security and privacy aspects of mobile cloud computing are discussed and conclude the paper with a new cryptographic technique based on Quantum cryptography (QC). New technique allows the users to store and process the data by providing the tempered proof ability of cryptographic technique. QC is a method of securing the communication by applying the miracles of quantum physics and its security depends on the validity of quantum theory.

Secure Data and Image for Hybrid Steganography and Watermarking Technique for Different Image File Format

Bandana and Prof. Akhilesh Jain

Abstract: "Steganography" is a technique that thwarts unauthorized users to have access to the crucial data, to invisibility and payload capacity using the different technique like discrete cosine transform (DCT) and discrete wavelet transform (DWT). The available methods till date result in good robustness but they are not independent of file format. The aim of this research work is to develop a independent of file format and secure hiding data scheme. The independent of file format and secure hiding data scheme is increased by combining DWT and least significant bits (LSB) technique. Accordingly an efficient scheme is developed here that are having better MSE and PSNR against different characters.

Machine Learning based Prediction of Anatomical Therapeutic Chemical (ATC) Class of Drug Like Molecule

Pankaj Vaidya, Ankit Gupta and Varun Jaiswal

Abstract: Drug discovery is costly and complex process with low success rate. Machine learning based computational method has been applied in different fields including drug discovery. Prediction of Anatomical Therapeutic Chemical (ATC) class of drug like molecule can provide therapeutic area or organ or system on which drug can be used. Computational prediction of ATC class of molecules only from structure (2D or 3D) can expedite the drug discovery process because no lab resources are required and even it can be done before the synthesis of any target molecule. In present research, Machine learning based method was developed using information of all small approved drug molecules. High accuracy of prediction in case of all 14 ATC class in independent test sets was achieved which warrants high reliability and usage of developed method.

Fault Detection by Sweep Frequency Response Analysis of 50 MVA 132/33 kV, 50 MVA, 50 Hz Power Transformer

Mr. Mahesh Ankushrao Adode and Dr. Bhoopesh N. Chaudhari

Abstract: paper deals with how insulation damage/short circuit in the winding of transformer can be distinguished by SFRA(Sweep Frequency Response Analysis). The test technique utilized is clarified. The power transformer rating 132/33 kV, 50 Hz situated at the transmission substation Phulambri, Aurangabad. We have tested the transformer before and after the occurrence of fault by SFRA testing method. All the short circuit and open circuit tests on both HV and LV side R, Y, B phases and

Neutral are performed. The results of the faults issues are spoken and analyzed. The motive of this presented work is to extend guide on interpretation of SFRA response. The paper displays the exploratory outcomes and investigations of the frequency responses on the variation of the winding parameters, which represents the deterioration of winding insulation and short circuit.

An efficient approach to perform Multi-Fuzzy Keyword Search over encrypted data in Cloud Computing

Bathina Siva Datta and Dr. Suhasini Sodagudi

Abstract: As the popularity of cloud services grows, more and more users choose to store their data on cloud servers to facilitate them, along with a reduction in data management costs. However, data owners want to encrypt sensitive data before sending it to cloud servers, which makes it impossible to perform keywordbased search. To work around this, a search scheme is proposed that works with encrypted cloud data that uses keywords for indexing and searching for queries. The scheme constructs an index by analyzing the data uploaded by the data owner. This index is used for searching over a query and retrieves the relevant documents. The scheme also provides "Fuzzy Search" capabilities along with an exact word search. This scheme enables users to upload encrypted data to the cloud and also provide them with search capabilities without showing any of the data or the query.

Color Palette Selection in Thermal Imaging for Enhancing Situation Awareness During Detection-recognition Tasks

Divya Agrawal and Vinod Karar

Abstract: Human ability to see clearly in dark/poor visibility conditions is very limited. This is because human vision is restricted only to visible portion of electromagnetic (EM) spectrum. Although, humans can perceive a colourful scene when sufficient ambient lighting is present, difficulty to visualize arises when ambient lighting becomes very low. Thus, making it difficult to detect/recognize objects/camouflage in a scene during low lighting conditions. This leads to a lack in situation awareness (SA) of observers as his perception of elements on the screen is affected. Use of thermal imaging essentially which captures information from infrared (IR) region of EM spectrum may help in solving this problem. IR imagery output is presented in different color schemes based on false color mapping. In this experiment, thermal imaging data was recorded for different color palettes during evening (~20 Lux) and night (~00 Lux) conditions. This work compares results of three thermal color palettes: white-hot, ironbow & rainbow, and, predict appropriate color palette to help in enhancing SA via better detection-recognition (DR) during low lighting conditions. Results suggest that use of 'white-hot' color palette seems ideal for enhancement of SA when using IR imaging during low ambient lighting conditions.

Comparative Wavelength-Dependent Analysis of GaAs Buried-Gate OPFET for Visible Light Communication

Jaya V. Gaitonde, Sudhir Pal Singh Rawat and R. B. Lohani

Abstract: Visible-Light Communication (VLC) is an area of interest in the recent years. GaAs buried-gate Metal-Semiconductor Field Effect Transistor (MESFET)-based Opto-Electronic Integrated Circuit (OEIC) receivers can function as high performance receivers exhibiting tremendous sensitivity with large bandwidth and simultaneous amplification in the visible range. In this paper, we study the

wavelength-dependence of optically-controlled buried gate GaAs MESFET parameters. The results show that there is no considerable variation in the characteristics with the wavelength of visible light in the range 450 nm to 700 nm. We have analyzed the results based on the absorption phenomena, the photoconductive and the photovoltaic effects, and the scaling rules-induced effects. The device shows high potential for applications wherein the same light source is used for lighting as well as communication.

Design of Compact Triple Band Monopole Antenna using Open-Ended and U-Shaped Slot

Samineni Peddakrishna, Sounik Kiran Kumar Dash, Usharani Anam and Papisetty Saritha

Abstract: A compact triple band coplanar fed monopole antenna to cover L-band, C-band, and X- band applications are proposed. The designed antenna generates triple resonant modes on a rectangular radiating element by creating the quarter wavelength open-ended slot and half wavelength U- shaped slot. The open-ended slot and U-shaped slot element can generate additional two resonant modes independently. These additional frequency bands can be generated arbitrarily with simple slots and hence the proposed procedure can be generalized to control any required bands. The rectangular radiating element, which is fed by a microstrip line covers a frequency band (2.4 GHz to 3.9 GHz) at around 3.0 GHz resonance frequency and the openended slot and U-shaped slot element covers a frequency band (5.95 GHz to 6.25 GHz) at resonance frequency of 6.15 GHz and (8.25 GHz to 8.65 GHz) at resonance frequency of 8.45 GHz, respectively. Also, the proposed design occupies a total area of 20×14 mm², which is compact.

Wine Quality Detection through Machine Learning Algorithms

Akanksha Trivedi and Ruchi Sehrawat

Abstract: Machine learning is one of the emerging areas of research. Many algorithms of data mining have already been used on wine quality dataset to analyze the wine attributes such as quality or class. The quality of wine is not only based on the quantity of alcohol but it also depends on various attributes, these attributes changes with time and so the quality of wine also refines. In this report, machine learning techniques are utilized to analyze those attributes. Firstly data pre-processing takes place i.e. making data appropriate for the models that are built for prediction. Defining independent and dependent variables, missing data handling, feature scaling and data splitting is done to improve the data standard. Then, Logistic regression and Random forest classifier are performed individually on data to predict the test data values. Random forest (RF) classifier outperforms logistic regression (LR) with accuracy 84% while LR has 76% accuracy rate.

Design and Development of FPGA based VLSI Architecture for Memory Efficient Motion Detection

Dr. Pradip Bhaskar and Aditi Kumbhar

Abstract: Video surveillance systems are highly desirable in this current technological world in order to detect movements in restricted and non-restricted areas for security purpose. Video surveillance is a computer vision-based technology used to monitor surrounding environment for public protection. Indeed, video surveillance system whether for indoor and outdoor surveying is essential for detection of running objects in video. The vital object monitoring and analysis has major issue to taken into

consideration. Extracting the frames from video sequences for image processing is important task in motion detection. Background subtraction is common method in motion detection. This article is related to the broad subject of motion detection and analysis in video surveillance image sequences. In this research, modified version of frame differencing with feature extraction is implemented. This article is related to implementation of frame differencing algorithm using Field Programmable Gate Array (FPGA) based Very-Large-Scale Integration (VLSI) architecture on video processing with 30 frames per sec of 256×256 -pixel resolution for motion detection. The main advantage of FPGA based system is its high performance when processing large amount of data flow, as video streams. This project has implemented using VLSI platform for video surveillance system on ARTIX-7.

Modelling and Simulation of Maximum Power Point Tracking Algorithm Based PV Array and Utility Grid Interconnected System

Sohel Aziz Syed and Dr. Alice N. Cheeran

Abstract: Depletion of non-renewable energy sources with the increasing demand in electricity and also to avoid islanding condition an efficient and sustained source of energy becoming mandatory. This paper focuses on mathematical modeling and simulation of PV module with boost converter interconnected with utility grid. MPPT algorithm named Incremental conductance (Inc. Cond.) technique is implemented in boost converter to extract maximum possible power from PV module which in turn depends on solar irradiance and temperature. The output from converter is fed to real time utility grid. This work lead to utilize the renewable solar energy at a large scale by interconnecting PV module and utility grid while extracting constant maximum power from module. This paper will review existing approaches on MPPT algorithms. PV module of 100kw is converted into AC and fed to utility grid. PV and IV characteristics are obtained by modeling mathematically for data sheet SunPower SPR-305E-WHT-D in MATLAB code. The output waveforms for power output from PV module before and after implementation of MPPT algorithm are analyzed through MATLAB Simulation.

Misuse and Anomaly Intrusion Detection System using Ensemble Learning Model

Anuradha S. Varal and Dr. S. K. Wagh

Abstract: System security is of essential part now days for huge organizations. The Intrusion Detection System (IDS) are getting to be irreplaceable for successful assurance against intrusions that are continually changing in size and intricacy. With information honesty, privacy and accessibility, they must be solid, simple to oversee and with low upkeep cost. Different adjustments are being connected to IDS consistently to recognize new intrusions and handle them. This paper proposes a semisupervised model based on combination of ensemble classification for network traffic anomaly detection. Ids is try to perform in real time, but they cannot improved due to the network connections. This research paper is trying to implement intrusion detection system (IDS) using ensemble method for misuse as well anomaly detection for HIDS and NIDS based also. This system used various individual classification methods and its ensemble model on KDD99 and NSL-KDD data set to check the performance of model. This system used training rule set as a background knowledge which are generated by genetic algorithm. Ensemble approach contains three algorithms as Naive Bayes, Artificial Neural Network and J48. Ensemble classifiers apply on network packets mapping with GA

rule set and generate the result. Finally our proposed model produces highest detection rate and lower false negative ratio compare to others.

Virtual Mouse Implementation Using Hand Gestures

Shridevi Soma, Rishav Kumar, Sandeep S S and Shrinidhi Gour

Abstract: The future of artificial intelligence will change everything about life, one way or another. The need for newer algorithms to advance the science of Machine Learning techniques. There is a huge amount of work that needs to be carried out to enhance the performance in Human Computer Interaction. The mouse which is a standard piece of computer equipment is either connected or uses Bluetooth to get connected to the system, both of which are short ranged. The proposed work in this paper help to the people with disabilities, who are unable to use the mouse. It helps people get through the negative impacts of using the standard mouse. Using this involves small and repetitive movements of the same muscles over and over for long periods of time. These factors can lead to discomfort, pain, and Workplace Musculoskeletal Disorders (WMSDs). To overcome these limitations, this paper tends to develop a “Virtual Mouse Implementation Using Hand Gestures”. Algorithm in this work are implemented using Python. Hand Gestures are taken as inputs in a Realtime video through a built-in webcam and the captured video is flipped to get the original video, as webcam captures a mirror image. Then it is converted from RGB to Grayscale format and Gaussian filter is used to remove the noise from the video. The video is then Binary Inverted using Simple thresholding and Otsu’s Binarization. Contours of the binary images can be found with its convex hull which can be used to get the convexity defects. Based on this number of defects the proposed work maps to the mouse operations in real time. Using which, one can easily move the cursor, do left and right clicks with simple hand gestures. Experimental results show that under the testing environment, the proposed simulated mouse can achieve the accuracy rate by 93%, and 7% of inaccuracy is due to the background distractions.

A Study of Printed Dipole Antenna and Conformal Structures for 5G based Vehicular Communications

Y.Usha Devi and M S S Rukmini

Abstract: An offset fed staircase structured, compact printed dipole antenna with integrated balun and defected ground structure (DGS) is presented in this work for 5G based vehicular communications and IoT applications. The designed model consists of a printed dipole and an etched rectangular slot in the ground plane to improve the impedance matching The proposed antenna is of compact size 10 x 13 x 0.254 mm³. The proposed antenna achieved -10 dB impedance bandwidth of 17.65 GHz and 2.24 GHz over the frequency ranges of 24.3-41.95 GHz and 49.91- 52.15 GHz. The proposed antenna attained a peak gain of 6.81 dB with 98.8% maximum radiation efficiency. The conformal models of the proposed antenna are developed to embed the antenna in different curved surfaces on vehicular body. The results obtained are in good agreement with it to support 5G frequencies for vehicular communications.

Software Reliability in Pakistani Software Industry

Faheem Yaqoob

Software reliability is the important factor to estimate the software quality and cost. It is the probability that software will work without failure for a specified period of time and environment.

Reliability of software is measured in terms of Mean Time Between Failure (MTBF). For instance if MTBF = 10000 hours for an average software, then it should not fail for 10000 hours of continuous operation. In this paper we specifically identify what are the current metrics for software reliability adopted by Pakistani software industry to ensure the software quality as well as software cost. Initially we conducted a reliability testing in lab setting; with the help of some reliability metrics e.g (MTBF). In order to further validate our findings we prepared a questionnaire and got it filled from different software development companies. Survey results highlighted that software development companies are not regularly used reliability metrics to ensure the quality of software in Pakistan. . The findings of our study help e-government practitioners and policy makers to ensure these reliability metrics for the software development companies to improve the software quality.

Towards the Greener Solar Technology

Rohan S. Kulkarni, Mr. Vishal R. Bhoi and Mr. Vijay Marathe

Abstract: The manufacturing of silicon solar from quartz requires many steps that are energy intensive and use large amounts of water and toxic chemicals like Silane (SiHCl₃). Third generation solar cell technology shows better results silicon cell in terms energy requirement and environmentally friendly production process. Organic solar cells (OSCs) have attracted strong attention in recent years, due to the advantages of flexibility, thinness, and simple manufacturing process. Organic solar cells degrade during illumination and in the dark. This is in contrast to photovoltaics based on inorganic semiconductors such as silicon. Long operational lifetimes of solar cell devices are required in a real-life application, proper encapsulation may result in lifetime increment of OSC. This paper includes the brief introduction of organic semiconductors and working principle of OSC. The comparison of OSC and Silicon cells are presented. The problem of degradation in OSC and one possible solution for that also included in the paper

Fault Diagnosis and Fault-Tolerant Techniques for Switching Power Converters: A Review

Satyawan R. Jagtap and Dr. D. S. More

Abstract: The widespread use of power electronic converters in different applications such as medical, electric vehicles, renewable energy systems and telecommunications has increased the need to provide uninterrupted service. According to a recent survey, the component faults such as switch faults, capacitor faults and gate circuit faults in the converters are responsible for main part of the converter failures. In this paper, fault diagnosis and fault-tolerant control schemes of the different power converters are reviewed from signal-and model-based prospective. The effect of switch open circuit fault and short circuit fault upon converter operation is presented. The review in terms of types of faults detected, methodologies incorporated, time for fault detection, switching frequency and fault-tolerant control schemes is also summarized.

Recognition of Handwritten Digits Using Computer Vision Preprocessor based Combined Architecture of Self-organizing Map and Backpropagation on MNIST Dataset

Samarth Srivastava, Suryabhan Yadav, Kalpaj Agrawalla, Tanisha Malhotra and Dr N. V. Subba Reddy

Abstract: In this paper, we propose a neural network system of combined architecture, using a self-organizing map (SOM) along with the concept of back propagation to recognize handwritten digits

from the MNIST dataset. The handwritten digits of the MNIST dataset were processed through a computer vision pre-processor. The general problem with the backpropagation method, which is its big learning time for large datasets, is attempted to be removed when used with an unsupervised mode of classification such as SOM when the data being used for backpropagation is already made to go through the SOM algorithm.

Real Time Diagnosis of Patients Health by Monitoring Various Body Parameters using Compact RIO Platform

Kanchan V. Patil, Dr. R. M. Autee and Vitthal K. Bhosale

Abstract: In India, there is poor patient to doctor ratio because of this the treatment and healthcare of patients becomes difficult. This poor condition increases the death ratio of humans especially in rural areas. The aim of this system is to monitoring and controlling patient's health without the presence of doctor near the patient. Doctor can monitor the patient from anywhere. The system has the sensors to examine the temperature, heartbeat rate and ECG of the patient's body. The patient's condition will be available to doctor on web server. This system allows the doctor to share his suggestions and prescriptions to the patients through sms using GSM. Sensor's output is shown on front panel of LabVIEW. All sensors are integrated to LabVIEW through compactRIO. This system can also be implemented using arduino.

Effect of Mobility and Different Frequency on a MEMRISTOR and Simulation on SPICE

Akhilesh Kumar Chaudhary and R.K. Sharma

Abstract: This paper consists of the basic definition of a memristor. How it is different with other fundamental circuit elements like capacitors, inductors, and resistors. This also includes numerous memristor models and a brief discussion on linear drift model I-V characteristics of this model and the effect of various ion mobility with the combination of different frequency. It's simulation on spsice showing hysteresis loop on I-V curve

Comparative Analysis of BER and PAPR of UFMC Waveform in 5G Wireless Communication

Prashant Sharma, Dr. Surender Soni and Manish Maharshi

Abstract: Fifth Generation of mobile wireless communication is going to be implemented in 2020 by mobile operators. There are several OFDM derived waveform contenders available for 5G in development phase. According to 3GPP standard's Release 15 Document UFMC, FBMC and GFDM are main waveform techniques for future mobile wireless communication system. OFDM implemented in 4G of mobile communication, which have several limitations like high PAPR and Out of band emission. To overcome the limitation of OFDM, UFMC is better waveform technique which has become most area of research in recent time. This paper elucidates the aspects of Universal Filtered MultiCarrier (UFMC) system and draw attention to the merits of UFMC for promising fifth generation (5G) Wireless Communication Systems. We have implemented different windowing technique i.e. Kaiser, tukey, Hann and dolph Chebyshev with different configuration and measured BER and PAPR correspondingly of UFMC waveform. After which we generated UFMC waveform with different mapping techniques 4QAM, 16QAM, 64QAM and 256QAM with recommended dolph Chebyshev windowing process and measured PAPR and BER with generation of PSD of waveform.

Performance Analysis of Adaptive Modulation by Optimized Viterbi Decoding

S Nandi, Ab Chaudhuri and J Bhar

Abstract: This paper exhibits the performance of both the hard and soft decision method of decoding for analysis of different existing adaptive modulation techniques by using Viterbi decoder. In hard decision Viterbi decoding, the received code word is compared with all the possible code words and the code word which gives the minimum Hamming distance is selected. While in soft decision decoding all the possible code words with the minimum Euclidean distance is selected in presence of Additive White Gaussian Noise (AWGN) Channel. The MATLAB codes are executed for signal to noise ratio per bit (E_b/N_0) with respect to bit error rate (BER) using convolution encoder and Optimized Viterbi decoding (HDVD) algorithm. Also the performance is compared for both the hard and soft decision decoding.

Demonetization (500&1000): Analysis of Sentiments using NLTK with Twitter for Text and Image

Sugandha Bhatnagar and Tarun Kumar

Abstract: The main objective of our research is to analyse sentiments on the activity that happened in 2016, named as demonetization. In our research we have collected data by using twitter API. Twitter Application provides four unique tokens i.e. consumer key, consumer Secret, access token, access secret. These keys are unique to every user and comes with certain constraints. After collecting tweets from twitter, preprocessing is performed i.e. removal of stop words like removing punctuations, hash tags etc. After that, by using NLTK we classified the tweets into positive, negative and neutral. In the end tweets are classified by using Kmeans clustering also. In the end, we finally came to a result which is also illustrated in fig 7. 44.1% public has shown positive sentiments, 26.5% has shown negative and 29.5% has shown neutral reaction.

Design High Speed FIR Filter based on Complex Vedic Multiplier using CBL Adder

Anjali Singh Thakur

Abstract: The main objective of this research paper is to design architecture for finite impulse response (FIR) filter based on complex Vedic multiplier by rectifying the problems in the existing method and to improve the speed by using the common Boolean logic (CBL). The Vedic multiplier algorithm is normally used for higher bit length applications and ordinary multiplier is good for lower order bits. These two methods are combined to produce the high speed multiplier for higher bit length applications. The problem of existing architecture is reduced by removing bits from the remainders. The proposed algorithm is implementation Xilinx software with Vertex-7 device family.

Analytical Approach towards Progression of Renewable Energy in Uttar Pradesh: Current Scenario, Obstacles and Future Problems

Faraz Yusuf Khan, Swapnil Shukla, Shrish Bajpai and Naimur Rahman Kidwai

Abstract: The Present manuscript deals with the barriers faced in the adoption of renewable energy technology by the citizens of India's most populated state, Uttar Pradesh. 250 Respondents have been

surveyed from all regions of Uttar Pradesh to scrutinize the reason behind sluggish adoption of renewable energy technology. Respondents' views and awareness regarding Government Subsidies for renewable energy, usage of electricity, educational background and Environmental awareness are some of the parameters which have been covered in this paper. Role of Private and Public sectors to help spread awareness regarding renewable energy technology in order to accelerate its adoption among rural and urban population of Uttar Pradesh have been mentioned.

Smart Digital Monitoring for Attendance System

Mohana H S and Mahanthesha U

Abstract: In the perception of attendance monitoring system, it takes the attendance automatically using Facial Recognition process. The construction is dependence on face recognition and applies the system to any classroom or laboratory while teaching. This concept is based on the algorithm called SURF (Speed Up Robust Feature). The method consist of capturing the individual student or group students Image in the class and compares with the pre stored individual identified images of the students with the individual or group image, if the student face is found in the group then the attendance will update. The entire code is written in software called MATLAB. Attendance database Storage is done in MS-Excel file. MATLAB is very high configuration software for simulation.

Embedding of Advanced Encryption Standards Encoded Data in Video using Least Significant Bit Algorithm

Anushree Patil

Abstract: Increase in the usage of multimedia applications has increased web security issues owing to attacks by hackers, crackers, trojans, etc. Cryptography provides confidentiality to the secret data by scrambling it and steganography hides the existence of the message from third party. The implemented system provides high security to the secret data being transmitted as it uses a combination of AES and LSB techniques where AES encryption is performed on text and then encrypted text is embedded in each segmented frame of cover video by LSB technique. Finally various experimental parameters such as Hamming Distance, MSE and PSNR have been documented which shows stego video is visually indistinguishable from the original cover video.

FinFET Source-Drain Stressor Design Beyond 7nm Technology Nodes

Tara Prasanna Dash, Suprava Dey, Sanghamitra Das and Chinmay Kumar Maiti

Abstract: The embedded-SiGe (e-SiGe) stressor has been an indispensable performance booster for p-channel FinFETs. In this work, based on extensive 3D process and device simulations, performance assessment of nanoscale tri-gate FinFETs with diamond-shaped e-SiGe stressor is presented. A comprehensive study is carried out to investigate the optimized shape and size of the stressor and their design on the device performance. The impact of process induced stress on carrier mobility enhancement in 7nm technology node is the major focus of this study. The stress transfer efficiency is shown for different stressor with various Ge contents. Technology CAD simulations show that strained source/drain stress transfer is large for higher Ge contents in the SiGe layer on relaxed buffer layer for p-channel FinFETs. The use of a diamond-shaped source/drain stressor to obtain higher performance benefits is demonstrated.

High-frequency Link Inverter based on Multiple-Carrier PWM

Sushil Ragde and S Kamble

Abstract: With the development of distributed generation, high frequency link inverter has attracted more and more attention which is suitable for future application because of its good performances such as small volume, low cost and isolated power conversion. High-frequency (HF) ac link inverter topologies, with or without soft switching, have important practical advantages compared to more conventional dc link inverters in terms of isolation, size of magnetics, and other properties. It is possible to obtain the basic advantages directly in a PWM inverter, but only if the transformer can handle the low modulating frequency. HF link topologies have not been common for medium power (1 to 20 kW), largely because of the number of power stages and control complexity. During a search for low-cost medium-power inverter topologies, our group recognized that HF links could reduce the parts count and the number of power processing stage.

A Survey on Spectrum Sensing Techniques And Energy Harvesting

Anitha Bujunuru and Dr. T.Srinivasulu

Abstract: The rapid development in wireless communication shows that the requirement of much more efficient spectrum management schemes. Several works have exhibits that majority of allocated spectrum is underutilized. Cognitive radio (CR) is a technology that aims to increase the utilization of licensed frequency spectrum by providing opportunistic access to secondary user (SU) by dynamic spectrum access without providing intervention to primary user. The most fundamental problem in CR is spectrum sensing that can detects the appearance of primary user (PU) in licensed band. Whenever the PU is under gone into fading or shadowing, spectrum sensing has lower probability of detection. The basic problems of sensing are avoided by considering cooperative spectrum sensing that requires the part of SU's energy for cooperation and this reduces the energy of the SU. In Energy harvesting, SU can harvest the RF energy from the received PU signal. This harvested energy is transformed to electric power to compensate the power required for cooperative spectrum sensing (CSS) there by improve the transmission efficiency of SU. This paper gives a analysis on spectrum sensing techniques, cooperative spectrum sensing and energy harvesting techniques.

Backup Protection to the Transmission Line using Optimal Number of PMUs

Suved Pakade and Anil Vaidya

Abstract: This paper proposed the backup protection to the transmission line based on current differential protection with optimal number of phasor measurement units (PMUs). To implement the proposed scheme, Mixed Integer Linear Programming (MILP)-optimization algorithm is taken for finding the minimum number of PMUs. Next, to provide backup protection scheme to transmission line, PMU is placed at the optimal locations and the voltage as well as branch currents of the indirectly observable buses are estimated. Proposed scheme uses positive sequence synchrophasor data obtained from PMUs. Proposed scheme developed considering phase comparison using positive sequence components after compensation of line charging current. Phase difference of the two ends currents is compared to detect the fault condition. The backup protection is provided to WSCC 9 bus system and the accuracy of the proposed scheme is analyzed using MATLAB Simulink and results are verified on OPAL-RT simulator.

Satellite Image Enhancement using Integrated Approach of Ant Colony Optimization and DCT-SVD

Mehreena Hasan and Tarun Kumar

Abstract: In this digital era of computing, digital image processing possess an essential part in various research applications from regular life work to medical, industry and other research fields. This processing of images digitally involves the procedure to change the structural characteristics of image. Digital image processing involves the steps of image segmentation, image registration, image classification, image compression, and image enhancement. In this research work, image enhancement method is implemented to improve the contrast of satellite images. Satellite images are the remotely sensed images captured from the satellite. Image enhancement is the concept to improve the visual features of image. These satellite images are extensively utilized for the pattern recognition applications like terrain feature, vegetation index, recognition of crop pattern etc. The common problem faced during satellite capturing is the long distance, availability of clouds and light variations. So, these captured images are of no direct use for any application. The foremost cause for blurred or dark image is the difference of luminance between two surfaces. Some precautions can be adapted to avoid dark and blurred images but nothing can control the fluctuation in weather or light variations around the earth surface. The one approach which can be considered to make these images usable is image enhancement. In this research work, we are using integrated approach of Ant Colony Optimization (ACO) and DCT-SVD for the enhancement of low contrast images. Here, SVD (Singular Value Decomposition) is considered to reduce illumination of image. DCT (Discrete Cosine Transform) is considered to extract the texture feature of image. Here, ACO (Ant Colony Optimization) is considered to optimize parameters of cosine transform function which further results in contrast and texture feature enhancement of satellite images. Experimentation is performed on the satellite images available in NASA's earth observatory Images. Results are evaluated in terms of Mean, Variance, MSE (Mean Square Error) and PSNR (Peak Signal to Noise Ratio).

Performance Analysis of Fuzzy Logic based UPQC for Improvement of Power Quality in Distribution System

Sandhya Rani Jyothi and Rashmi Kapoor

Abstract: Flexible AC Transmission System (FACTS) is the trending technology for improving the power quality in distribution system. The distribution system undergoing significant changes due to the large usage of power electronic converters which create the harmonics problem, a severe power quality issue. Most of the loads in distribution system are inductive loads i.e, induction motor which is cause for voltage sags, is an another form of power quality problem and voltage swell because of sudden tripping of loads further extending this issue. As we know, distribution system is subjected to faults, which causes the unbalance in the system is also another source of the power quality problem. To mitigate this problem fuzzy logic control based Unified Power Quality Conditioner (UPQC), a FCATS family device is proposed in this paper. A modified form instantaneous p-q theory is used to control the series and shunt converters of UPQC. The UPQC is connected at point of common coupling (PCC). The accuracy of fuzzy logic controller is tested. The performance analysis of fuzzy logic control based UPQC and all the simulations are carried out in MATLAB/Simulink environment.

Interactive Scene Analysis

Suprava Patnaik, Vinaya Wate, Suraj Gaurav, Noida Fernandes and Adish Bhatkar

Abstract: This paper addresses an interactive scene analysis API. The primary contribution of this work is integration of text and object extraction. An android application has been proposed which gets

instruction from user to recognize objects and extract texts present in the scene. Output can be in form of probability of an object belonging to a set of predefined classes in textual or aural version of the text. The API has been tested for images with multiple objects, texts of varying font style and orientation. The motivation of the work is to develop a user-friendly API which would be interactive and configurable for applications suitable for tourism or as assistance for visually impaired people or as a surveillance system and so on.

Interface for Physically Disabled

Mamta D'Britto, Abhijit Joshi and Narendra Shekokar

Abstract: The current computer interface set up of a mouse and keyboard requires the user to have full use of his or her hands. Unfortunately, many people are not in a position to use their hands due to injury or illness and are thus unable to use a computer using traditional hardware setup. There have been many alternative assisting technologies that assist such disabled people. But they still lack in some functionalities. This paper presents an approach and shows how speech recognition can help such people to accomplish their tasks with PCs.

An Efficient Congestion Control by Loss based Active Queue Management Technique

Devpriya Panda, Sukant K Biosy and Chhabi Rani Panigrahi

Abstract: In this work, an active queue management (AQM) technique named LPI has been proposed as network algorithm supporting TCP flows to control congestion in the network. It helps in predicting the future value of the packet drop probability by considering the past history of error in queue length and measured packet loss ratio. Performance of proposed technique is analyzed with well known existing techniques such as proportional integral (PI), random early detection (RED) and random exponential marking (REM). The result shows that proposed technique successfully stabilizes the queue length around desired target with small oscillation and lower delay as compared to others. It is more stable and outperforms existing techniques.

Decentralized Predictive Control of Distributed Generator and Energy Storage System in an Islanded Microgrids

Jayachandran M and G Ravi

Abstract: This paper presents a decentralized power flow control scheme for an islanded microgrid which comprises multiple PV/Battery hybrid sources. Conventional droop control with MPC employed to track maximum power of photovoltaic (PV) module, regulate voltage at DC bus and manage the power among hybrid sources. Moreover, by applying optimum switching sequence to battery converter can control the state-of-charge (SoC) of batteries. In the proposed control method higher SoC of battery delivers more power than that with lower SoC. Finally, Load power sharing between distributed generator with energy storage hybrid systems is presented in order to validate the proposed control strategy.

An Application-specific Architecture for Routing Protocol in Wireless Micro-sensor Network

Poonam Saini and Deepak Bhatia

Abstract: Frameworks organization together hundreds or thousands of terrible microsensor center points empowers customers to accurately screen a remote circumstance by keenly combining the data

from the individual center points. These frameworks require intense remote correspondence traditions that are imperativeness beneficial and give low inactivity. In the execution of this paper, we analyze low-imperativeness flexible federation stages of management, a tradition designing for microsensor frameworks that combines the considerations of essentialness powerful cluster-based coordinating additionally, media get to together with application-specific data mixture to achieve incredible implementation in regards to assembly lifetime, inertness, similarly, application-saw excellence. Deplete consolidates another, appropriated pack improvement methodology that engages self-relationship of colossal amounts of center points, computations for modifying clusters likewise, turning bunch scramble toward similarly pass on the essentialness stack among each one of the center points, and techniques to enable scattered banner taking care of to save correspondence resources. Our results exhibit that LEACH can improve structure lifetime by a demand of degree differentiated and all around valuable multi-bounce approaches.

IMC Tuned Modified Smith Predictor for Delay Dominated Integrating Processes

Somak Karan and Chanchal Dey

Abstract: Internal model based controller (IMC) tuning is well accepted in process industry for their simple designing and effective performance. Smith predictor based control technique is well-known strategy for controlling processes with large dead time. But, Smith predictor technique fails to perform satisfactorily during transient as well as steady state operating phases for delay dominated integrating processes. Among the chemical plants, distillation column and chemical reactors are well-known integrating processes with significant amount of time delay. Here, we propose an IMC tuning scheme for modified Smith predictor reported by Kaya and Atherton [8] towards achieving improved response during set point tracking and load rejection phases. Performance of the proposed scheme is verified through simulation study with the well-known delay dominated integrating process models representing the behavior of chemical reactors and distillation column. Improved close-loop responses have been observed with enhanced performance indices in comparison with conventional and modified Smith predictor methodologies.

Methods and Means of Incoming Quality Inspection of Printed Circuit Boards

Dmitry Korzh, Dmitry Vorunichev and Mihail Kostin

Abstract: The paper presents the main results of scientific and practical research on the incoming inspection of PCB products. The application of various methods of defective constructions and topology of multilayer PCBs is considered: visual, ultrasonic, radiographic, in-circuit and peripheral scanning. The main technical characteristics of equipment and software for each of the methods are presented and recommendations are offered for their optimal application for different types of production.

Computational Linguistic Approach for Sentiment Analysis

Prakash Kumar Singh and Sanchita Paul

Abstract: In the past decade, technological advancement and the rise of social media such as twitter, Facebook, blogs and other review sites and easy accessibility of these sites through Apps has enabled

the people share their opinion about the incidents happening around in any corner of the world by writing their review leading to the generation of Million Terabytes of unstructured and structured data per day. This sheer volume of data on social media is also very much used by the companies to make their brand value and by the political parties who wants to influence the people through their campaign on social media. In this paper we captured these online movie review text data from IMDB and applied various natural language processing and machine learning techniques along with the linguistic model to make the system understand the hidden semantics of the users text reviews. Applied various document representation techniques in terms of vectors/metrics so that these vectors can be consumed by machine learning techniques in order to learn the user sentiments in the text data. Experiments are carried out in python language and results of various models are evaluated to analyze their performance.

Standalone PV System with Fuzzy MPPT controller

Ramu Edukulla and Sobhana O

Abstract: To provide the reliable and regulated power supply to the consumers of constant residential loads and voltage regulation with the help of a fuzzy logic controller MPPT. The MPPT logic control perform the effective voltage across the dc link with the help of Zeta converter and the battery storage system is effectively utilized with the help of using a Bidirectional converter. To simulate the system, Sun power Technologies SPR-245-NE-WHT-U-240 ACPV Matlab module for a residential capacity of 5Kw.

A New Wireless Sensor Network based Model for Healthcare Data Collection from Rural Areas

Hirav Shah, Amit Sengupta, Sudipta Roy, Hemant Singh Rao and Akash Bhardwaj

Abstract: Many healthcare solutions and platforms are proposed for rural people but in the developing country, it is not possible to use such technologies as the availability of mobile network is very poor in rural areas. The main objective of the study is to make a network consisting of nodes and intermediate nodes using which the data is collected from no-network areas which is rural areas in our case to internet accessed areas or network areas. The network efficiency is tested and made efficient using Log-Linear Regression model by taking two parameters as attributes which are latency and packet counts. We have proposed the solution to rural healthcare problem specifically which has an implementation in no network areas.

Channel Estimation and Data Detection using Optimized Cyclic Prefix in MIMO OFDM Systems

S Nandi and Nn Pathak

Abstract: A new semi-blind channel estimation with optimized Cyclic Prefix (CP) assisted Space Time Block Coded Multi-Input Multi-Output Orthogonal Frequency Division Multiplexing (STBC-MIMO OFDM) system is proposed. The main hurdle of high complexity and low convergence in earlier systems are avoided by our proposed scheme in flat fading environment. In our work, the hyper parameters are optimized with Lévy Krill-herd (LKH) algorithm and it is clear that the channel estimation performance is varied with this parameter values and by this global optimization technique the incorrect selection of hyper parameters (local optima) are eliminated. The selection process of this

algorithm can be simplified with the number of bounds used. Also the improvement performance is shown by using BER vs SNR plot of Forward-backward (FB) Kalman helical approach and different pilot carrier insertions. Also a comparative plot is simulated among FB Kalman, Krill-herd (KH) and finally LKH approach by using Matlab software.

Design and Performance Analysis of Transmission Gate Based 8T SRAM Cell using Heterojunction Tunnel Transistors (HETTs)

B V V Satyanarayana and M Durga Prakash

Abstract: Static Random Access Memory is a type of semiconductor memory that uses bi-stable latching circuitry (flip-flops) to store each bit. SRAM exhibits data remembrance but it is still volatile in the conventional sense that data is eventually lost when the memory is not powered. The power consumption of SRAM varies widely depending on how frequently it is accessed. Several techniques have been proposed to manage power consumption of SRAM-based memory structures. A typical SRAM cell is made up of six MOSFETs. SRAM plays a substantial role in the world of microprocessors. As the world is craving for devices that are compact and portable, there is a need to reduce the size of SRAM that comprises about 70% of the SOC (System on Chip). Scaling is the one of the best techniques used in CMOS IC technology. While scaling down of the CMOS circuits, there arises a problem of high leakage losses. For solving this problem in SRAM cells, a transmission gate based 8T SRAM cell is used. The 8T SRAM cell is analogous to the 6T SRAM cell, the only exception being the 8T SRAM cell possesses full transmission gates which replace access pass transistors. In this work, the transmission gate based 8T SRAM cell to minimize the power consumption and losses is designed and implemented by using Heterojunction Tunnel Transistors (HETT) and the performance analysis is done with reference to conventional transmission gate based 8T SRAM Cell.

Implementation of a Fuzzy Controller on Low-Cost Embedded Systems for Learning Process Control

Jorge Buele, John Espinoza, Victoria López, Pablo Zambrano, Angel Soria, Daniel Fiallos, Franklin Salazar and Homero Velasteguí

Abstract: In this paper we propose the low-cost solutions granted to university students to contribute to their professional development. Two control systems were simulated applying embedded devices, such as the BeagleBone Black and Udo Neo Full boards applied on a didactic flow station. With these prototypes, the aim is to develop critical thinking in the user as well as putting into practice, the learned concepts about advanced controllers. To visualize the events produced, an interface can be made in the software LabVIEW and the option of saving this data in an .xlsx file is added for the later analysis of this information. The validation of the project is carried out by evaluating the acceptance of these characteristics by the students and the experimental results of the controller to changes in the set-point value.

Analysis of Segmented SAR-ADC in 90nm CMOS Technology

Anil Khatak, Manoj Kumar and Sanjeev Dhull

Abstract: Prerequisites for any signal conditioning & processing of analogous signals are digital data converter circuits. Design that mostly utilised for this purpose is SAR-ADC as of its optimum performance for speed, resolution & power consumption. An analysis of segmented SAR-ADC in 90 nanometre CMOS technology at a supply voltage of 0.7 V is presented in this manuscript. The design

is simulated for different output bits and their respective power consumption is recorded. Segmented SAR-ADC consume maximum power of 475.57 μ W which varies marginally for different output bits. Integral & differential nonlinearity are also calculated which comes out to be less than one LSB. Two more SAR-ADC are also simulated in same parametric environment for comparison which shows better performance for SAR-ADC. Simulations are executed by employing SPICE based on 90 nm CMOS technology.

Peak Insertion and Active Constellation Extension with Subcarrier Grouping PAPR Reduction Techniques for OFDM System

Pranav Kashyap and Khushal Thakur

Abstract: Orthogonal Frequency Division Multiplexing (OFDM) is a spectrally efficient multicarrier modulation technique for high speed data transmission over multipath fading channels. Along with number of advantages of using OFDM there are some issue such as the transmitted signals get suffered from high Peak-to-Average Power Ratio (PAPR). Different researchers have proposed various techniques to handle the above mention problem but that leads to the increment in the complexity of the system, higher Bit error rate (BER) and transmitted signal power, etc. In order to get rid of the above defined issues an Active Constellation Extension (ACE) method with subcarrier grouping has been discussed that gives better results in terms of various performance parameters like PAPR and BER but there was a issue of disturbance in adjacent channel due to use of clipping technique for power reduction in initial stage. So, in this study we have proposed an idea of Peak Insertion (PI) technique which can be used in place of clipping technique in the discussed ACE scheme with subcarrier grouping to deal with PAPR problem. As, it has been concluded from survey that among different PAPR reduction techniques, PI found to be an effective technique which can reduce PAPR to an extent by inserting a relatively high impulse. The Matlab is used for analyzing the scheme of ACE with subcarrier grouping which gives better results in terms of both PAPR and BER.

Prediction-based Routing Protocol for V2V Communications in Urban Environment

Tran Hung

Abstract: In VANET, the routing is a difficult problem due to unpredictable nodes as vehicles movement and frequent network topology change. Therefore, the most important issue is to predict correctly the future movements of vehicles when selecting intermediate nodes. This paper proposes a Geography Move-ment Prediction Routing protocol (GMPR) for V2V communication in urban environment that combines vehicle's geography information and movement prediction. Theory analysis and experiments show that the proposed algorithm outperformed the conventional algorithms on the comparisons of packets delivery rate, average end-to-end delay and average number of hops.

Weather Parameters Analysis for Hourly Forecast of Electricity Generation by Photovoltaic Power Station on the Day Ahead

Petro Lezhnyuk, Vyacheslav Komar, Serhii Kravchuk and Natalia Sobchuk

Abstract: The paper presents an analysis of the mechanisms of functioning of the new model of the wholesale electricity market. According to this, the work of stations based on the using renewable energy sources (RSE), in particular photovoltaic power stations (PPS), should take place on the basis

of the announced hourly generating graph by the owner of the station one day ahead. In order to ensure the accuracy of the predicted graph, a study was carried out on the determination of meteorological parameters that most affected the generation of electricity at photovoltaic power plants. Results of cluster and regression analysis were conducted on the basis of meteorological data, measured at the station located in the Vinnitsa region.

Solar Tracking Module using Arduino

Deepak Rasaily, Anmol Pradhan, Dhan Rupa Chettri and Tika Maya Sharma

Abstract: One of the most promising renewable energy sources characterized by a huge potential of conversion into electrical power is the solar energy. The conversion of solar radiation into electrical energy by Photo-Voltaic (PV) effect is a very promising technology, being clean, silent and reliable, with very small maintenance costs and small ecological impact. The continuous modification of the sun-earth relative position determines a continuously changing of incident radiation on a fixed PV panel. The point of maximum received energy is reached when the direction of solar radiation is perpendicular on the panel surface. Thus an increase of the output energy of a given PV panel can be obtained by mounting the panel on a solar tracking device that follows the sun trajectory. Unlike the classical fixed PV panels, the mobile ones driven by solar trackers are kept under optimum insulation for all positions of the Sun, boosting thus the PV conversion efficiency of the system. The output energy of PV panels equipped with solar trackers may increase with 10%, especially during the summer when the energy harnessed from the sun is more.

Implementation and Analysis of Wavelet Transform Methods for Satellite Image Resolution Enhancement

Vijayalaxmi Patil and Santhosh B

Abstract: Satellite images are used in the field of research and video processing applications. The main issue of satellite image interpretation is its low resolution. Resolution can be defined as the smallest number of discriminable detail in an image. To resolve the drawback of satellite images Image Resolution Enhancement Methods are used. The major application in image processing is Resolution Enhancement. This application is used to modify the satellite images so that modified images are of better quality with enhanced the edges. Their resolution is modified due to instruments used and the height of the satellites orbits. In order to increase the resolution of any image, interpolation techniques are adopted. When the images are interpolated, the high frequency components in the low resolution (LR) image are lost. To overcome this problem a new satellite image resolution enhancement algorithm based on Wavelet Transform Methods like DWT, SWT, DWT with SWT and Proposed Method(Enhancement Method) is used. Transform domain methods have been used to improve the resolution of images. The implementation of different wavelet methods are carried out and the resultant images are tested with the different wavelet transform methods also compared in terms of PSNR, MSE, RMSE, MAE, UQI, PCC and time

A Survey on Routing Algorithms for Wireless Sensor Network

Harsh Sharma and Kanika Sharma

Abstract: Increasing the life of the sensor nodes in Wireless Sensor Network (WSN) is essential to make any network functional. Since the energy of the nodes are limited and cannot be replenished, so saving the nodes energy is the only solution. Routing algorithms in the WSN play a very vital role in

saving the energy of the sensor nodes. The routing algorithms are generally helpful in selecting the optimal path between the nodes (source and sink) in the network to save the energy of the nodes in the network. The main aim of this paper is to present various techniques for saving the energy of the sensor nodes which helps the future researchers to develop advanced energy-efficient algorithms in WSN

Optimization of Energy Consumption in Routing of Wireless Sensor Nodes in Disaster Environments

Zeynab Nomiri and Esmail Zeynali Khosraghi

Abstract: Wireless sensor network, consists of spatially distributed autonomous sensors to monitor physical and environmental conditions. Wireless sensor networks are composed of a large number of disposable wireless sensors that collect information about their surrounding environment and transmit them to the end user. Group of small sensor nodes that are able of sensing, processing and transmitting data correlated to some occurrence in the network area are termed as WSNs. The sensor nodes have rigorous shortcomings, such as: bandwidth, short broadcasting range, limited CPU processing facility, memory and energy. Because of limited power battery of sensor nodes, sending data from sensors to sink is a challengeable issue in these networks. Increasing energy optimization is important and various methods have been proposed to increase the lifetime of the sensor nodes in a network. Energy efficient routing algorithms have been mentioned in various articles in order to enhance network lifetime. In this paper, we proposed approach energy optimization in routing of wireless sensor nodes in disaster environments which is known as HP-method. The proposed sensor network nodes need to be appropriate to be established in an environment with a particular atmosphere (e. g. high humidity like the sea, high temperature like fire, etc.) as well as severe effects (such as explosions). The proposed network nodes have been considered with different. Such as: (earthquake, pre-earthquake, post-earthquake, identifying victims under falling rocks). HP-method is evaluated through extensive simulations in the NS-2 environment. The results show that HP-method outperforms other existing solutions in terms of delay, throughput, residual energy and life time.

Pole Placement Technique for Control of an Inverted Pendulum on a Cart System

Afreen Islam and Dr. Satyajit Bhuyan

Abstract: In this paper, an inverted pendulum on a cart system is considered, which is an under-actuated system. In addition, the system dynamics are highly nonlinear. The inverted pendulum is required to be stabilized in the vertically upright position. The nonlinear mathematical model of the system derived is converted to a linear model, by considering small angular deviations. Thereafter, state feedback control using pole placement technique is applied to stabilize the pendulum in the vertically upright position. Simulation results indicate that in a very few seconds (2-3 seconds), the pendulum is stabilized in the vertically upright position demonstrating that pole placement technique is a suitable technique for stabilizing under-actuated systems like an inverted pendulum on a cart system.

Performance Analysis of Voice over Internet Protocol (VoIP) over LTE Networks

Smita Lonkar and K T V Reddy

Abstract: With increasing number of voice call applications and increasing features of the internet, Voice over Internet Protocol (VoIP) has become available to customers. The high data rate is the demand of increased mobile users. Long Term Evolution (LTE) is the 3GPP wireless standard which is fully IP based provides the solution to this demand due to its higher capacity, data rates, and reduced latency. As LTE only supports packet switching across an all IP network, voice call solution for circuit switching is not available. VoIP is introduced to enable voice calls over LTE network. The Quality of Service (QoS) of VoIP over LTE network is analysed in this paper. Multiple scenarios are simulated to measure and analyse performance by measurement of delay, jitter, packet loss and throughput.

A Novel Single Carrier Frequency Domain Channel Equalizer without Cyclic Prefix

Ugur Elmagoz, Yasin Kus, Mukremin Kavlak and Ali Ozen

Abstract: In this paper, a novel single carrier frequency domain channel equalizer (UW SC-FDE) with cascaded Reed Solomon and convolutional coding is recommended, which uses different unique word (UW) sequences instead of the cyclic prefix (CP). The effects of different unique words (UWs), such as 64-bit CAZAC, 64-bit Zadoff-Chu, 63-bit PN, 0-word, consisting of all zero values of 64 bits, 1-word, consisting of all 1 values of 64 bits and -1-word, consisting of all -1 values of 64 bits, sequences, on the performance of the recommended method are investigated. In order to evaluate the performance of the recommended method, computer simulation studies have been done on frequency selective Rayleigh fading channels. The obtained simulation results illustrate that the recommended UW SC-FDE technique has better uncoded and coded bit error rate (BER) performances than the classical SC-FDE, classical OFDM-FDE and UW SC-FDE methods.

Small Scale Grid Penetration Strategies

Debashis Jana, Arpan Sinha, Barun Mandal, Debapriya Palai and Aruni Maji

Abstract: The development of energy management tools for consumers and next-generation smart PV installations, including storage units, provides flexibility to distribution systems. The Smart Grid is regarded as the next generation power grid, uses the two-way flow of electricity and information to create a widely distributed & automated energy delivery network. In this paper, a MATLAB based Simulink model of the smart area has been designed and studied under various load condition in a span of 24 hours. The proposed distribution network is modelled with distributed generations by using suitable load flow calculations. The “smart power management” by the aspect of a smart city is studied through simulation results. Under some predefined condition the proposed model at a micro-grid level showing the effectiveness of the DG penetration in grid technology.

Analysis of Various Trust based Security Algorithm for the Vehicular Ad-Hoc Network

Kuldeep Narayan Tripathi, Dr. S. C. Sharma, Ashish Mohan Yadav

Abstract: Due to the exponential growth in the automobile industry and road transport, there is need of intelligence transportation system (ITS). Vehicular ad-hoc is a part of intelligence transportation

system (ITS), which provides security, traffic efficiency and ease to the user. In Vehicular network various nodes exchange the messages and data for the communication. For transmitting the data from source to destination node, we have to rely on intermediate nodes due to limited range of the vehicular nodes. To check the reliability of data delivery we have to find out that which node is trustable or which node is faulty. There are various algorithms presents by various authors to compute the trust of different-different nodes presents in the network. Trust based algorithms are easy to implement and requires very less calculation overhead. The authors have studied and analyzed various trust based security algorithms in terms of approach and tools used by different authors. The different attacks and the limitations of the various trust based security algorithms are briefly summarize in table-1. Further authors have compiled in table-2 the attacks with targeted services and possible solutions. The various simulation tools used to simulate the vehicular ad-hoc network are summarized in table-3. The paper is useful for the bingers who wish to carry out further analysis on trust based security algorithms for vehicular ad-hoc network (VANET).

Reconstructing the Evolutionary Trajectories of the Progesterone Receptor gene and Spi-1 Proto-oncogene based on Information-Theoretic Differences between Modern Human and Neanderthal

Sunil Dehipawala, Regina Sullivan, Eric Cheung, George Tremberger Jr, David Lieberman and Tak Cheung

Abstract: The information-theoretic analysis based on Shannon entropy has been applied to the study of the differences between modern Human and Neanderthal genes in terms of the Progesterone receptor gene PGR and Spi-1 proto-oncogene SPI1. Shannon entropy values were computed using the gene and mRNA sequences. A Shannon entropy scatter plot for a studied gene would show a trend in terms of evolutionary adaptation. The reconstruction of an evolutionary trajectory across the studied species, namely, Rhesus monkey, Gorilla, Chimp, Neanderthal and Human, could show an outlier using the R-sq value as a discriminator. The results showed that the SPI1 gene sequence versus the mRNA sequence in the Shannon entropy plot would give $R\text{-sq} = 0.94$ (Rhesus monkey, Chimp, Gorilla, and Neanderthal $N = 4$) in contrast to $R\text{-sq} = 0.14$ ($N = 5$) when human sequences were added. The adaptation requirement for the Human SPI1 sequences would have been much higher than that of the Human PGR sequences. Application to the analysis of the regulatory effect of PURA (purine rich element binding protein A) sequences on PGR sequences in terms of drift and diffusion coefficients as defined in the Fokker-Planck equation used in engineering science is discussed. The correlation constraints suggested by a trend in the Shannon entropy graph could be related to biologically-based metabolism, while an outlier could indicate the presence of constraints related to epigenetically-enabled behaviors.

Fractal analysis of Image Contour Features in Killer T-cell and Solar Dynamics Observatory Video Data

Sunil Dehipawala, Regina Sullivan, Eric Cheung, George Tremberger Jr, David Lieberman and Tak Cheung

Abstract: The box-counting fractal analysis method was used to study the Killer T-cell motion captured in video data. The contour dynamic feature at the interface boundary between a Killer T-cell and a cancer cell was parametrized as fractal dimension changes in time. A similar fractal method was also applied to the study of the contour features in video data captured by the Solar Dynamics Observatory. The T-cell analysis results showed that the complexity of the cell boundary reached a minimum, which is consistent with an interpretation that the Killer T-cell and cancer cell communication may have reached a key level. The modeling of the contour feature in the Killer T-cell image data using the Higuchi fractal method of a single variable function was also applied, and

consistent results were obtained. The fractal analysis of the solar images showed that the gradual development of magnetic complexity, as indicated by the Fe ion 9.4 nm differential signal, may be responsible for a partial eruption in the studied video. Applications of fractal analysis with respect to the complexity within contour features in cancer immunology (including oral health) and space weather studies are discussed.

Brain Stroke Detection using Integrated K means and FCM in Brain Images

Maya B S and Asha T

Abstract: Image segmentation refers to the process of partitioning an image mutually exclusive regions. Despite intensive research, segmentation remain a challenging problem due to the diverse image content, cluttered object, occlusion, image noise, non-uniform object texture, and other factors. There are many algorithms and techniques available for image segmentation but still there needs to development an efficient, fast technique of medical image segmentation. This paper presents an efficient image segmentation approach using K-means clustering technique integrated with Fuzzy C means algorithm. It is followed by thresholding and level set segmentation stages to provide an accurate brain stroke detection. The proposed technique can get benefits of the K-means clustering for image segmentation and it takes 0.12s computation time. In addition, it can get advantages of the Fuzzy c-means in the aspects of accuracy, it yields 98%. The performance of the proposed image segmentation approach was evaluated by comparing it with some state of the art segmentation algorithm in case of accuracy ,processing time and performance.

Increasing the Efficiency of Outcome in Chatbot by Applying Embedded Search Engine

Parimi Shiva Kalyan, Ch Vijaya Bhaskar and V Kakulapati

Abstract: Chatbots are applications which are written in order to accomplish tasks which do not require much of human interaction, such as troubleshooting, the solution to the problem through Artificial Intelligence etc. In the experimental analysis of the Chabot, we used JavaScript, which provides both static and dynamic replies according to the user query. The static replies are coding by the programmer whereas the dynamic replies are sending to the user via computing the keywords from the user's text into the embedded search engine to retrieve relevant results to the user according to their wish.

Adaptive Neuro-fuzzy inference system for Binaural Source Localization

Jeremy Scerri, Kris Scicluna, Clive Seguna and Joseph Zammit

Abstract: The effectiveness of a black box model to estimate the azimuth angle of a sound source using two microphones is presented. Two electret microphones are placed at the ear positions of a polystyrene dummy head with human-like ear-to-ear separation. The interaural time difference (ITD) and interaural level difference (ILD) are two cues that are used extensively for binaural source localisation and these, together with the frequency content of the sound source are used in this paper. The black box structure proposed is a Sugeno type fuzzy inference system (FIS). The structure of the selected FIS is adaptively tuned by presenting it with training data consisting of ITD, ILD and

frequency content. Training was successful and the results achieved on azimuth angle estimation for both bandlimited white noise and speech sound sources are presented. These results are comparable to what is currently state of the art.

Thyristor Binary Compensator Strategy for Reactive Power Compensation and PF Improvement using Static VAR Compensator

Ajay Lohate and Mandar Chaudhari

Abstract: the electrical field has to go through many problems related to power quality. It is of the extreme importance to enhance the power quality as well as power factor with minimization of harmonics and losses. In this paper, the control strategy i.e. thyristor binary compensation along with SVC is used consisting of capacitor banks in binary sequence for reactive power compensation and power factor improvement. This technique stabilizes the system as well as it approaches the power factor closer to unity.

What We Can Do To Save Humanity in the Coming Era of Global Eavesdroppers

Victor Christianto, Florentin Smarandache and Victor Christianto

Abstract: In this paper, we tried to draw a fair assessment on things which will take place soon with the coming era of IoT, 5G technology, global eavesdropping and all that. Nonetheless, we are aware that this article sounds quite gloomy. We are not techno-utopians (read Evvgeny Morozov's WSJ article on digital dictatorship¹), but we are not techno-pessimists either. Perhaps you can consider us as: "techno-realists."² This paper was written in the same spirit of Jonathan L. Zittrain's book: The Future of Internet and how to stop it.

Research of Athletes' Movements Biomechanics in Big Tennis using Motion Capture Technology and Image Processing

Olga Shikulskaya, Dmitriy Anuriev, Mikhail Shikulskiy and Ruslan Ramozanov

Abstract: In work the need for research of tennis players' movements biomechanics for increase of trainings productivity and detection of the latent chronic diseases and micro-injuries is shown. Use of the Motion Capture technology for research of movements biomechanics allows to register and transfer information on the person movements to a digital format. Big arrays of information are useless without the revealed regularities in them. The approach allowing to transform the obtained digitized data to mathematical dependences, and then dependences to transfer to abstract vector variables is offered. It allows to automate processing of data files. The algorithm of secondary mathematical processing of the digitized data, an electronic template for the automated

Fractal Analysis of Cosmological Galaxy Formation Simulation Images and Application to Instrumentation

Sunil Dehipawala, George Tremberger Jr, Raul Armendariz, Corey Stalerman and Tak Cheung

Abstract: The box-counting fractal analysis method was used to study some of the cosmological galaxy formation simulation images in the IllustrisTNG project. The magneto-hydrodynamical simulations of galaxy formation provided simulation images of dark matter and stellar matter in three

different redshift values. Fractal analysis results showed that the dark matter and stellar matter spatial distribution had a high correlation with adjusted R-sq value of 0.985 $N = 3$, consistent with a Universe evolution driven by the spatial complexity of dark matter. A plot of Shannon entropy versus fractal dimension for the studied three redshift simulations showed a dark matter trend (adjusted R-sq = 0.925 $N = 3$) and a nearly orthogonal stellar matter trend (adjusted R-sq = 0.994 $N = 3$). The interpolation of the dark matter trend showed a maximum fractal dimension of about 1.97, suggesting that dark matter had a correlated randomness at the earliest detectable epoch. The magnetic field topology in the simulation images were analyzed and the results showed that late-type galaxy magnetic field topology exhibiting high fractal dimension and Shannon entropy values. The relationships of black hole and information- theoretic properties to instrumentation resolution such as in the measurement of muon flux volatility are discussed.

Design and Analysis of IoT Topologies using SDN Platform

Dhananjay Mule and Bharat Chaudhari

Abstract: Information and communication industry (ICT) is primarily based on two aspects that are computation and network. In past few decades there is huge improvement in data processing technology with development of processors, but networks are not converged so far. For implementing industry 4.0, in which large number of IoT devices will be sharing the data with each other making true machine to machine communication. Management of these devices is not suitable as current network provide distributed management resulting congestion because of poor resource management. This project suggests use of Software Defined Network (SDN) approach, it separates Control and data plane of network devices. This separation will provide more agility, stability and cost reduction. Various protocols like OpenFlow and NetConf are used for discovery and configuration of remote devices. Centralize management is achieved using controller, improving monitoring, diagnosis and reconfiguration.

Applied Communication Technology To Support Tourism Web Collaboration At Provincial Level In Indonesia

Suroto Adi and Sulistyo Heripracoyo

Abstract: Basically tourism websites were developed for the purpose of disseminating information on tourism products and attracting tourists to visit tourism destinations. Tourism business is not a single business but there is number related business such as transportation, hotel, culinary, and tour and travel as well. Currently, at the provincial, and the office of tourism and the business actors have owned website but their websites were generally built apart from each other. So that, indirectly the existence of the website has not been optimal in boosting the increase in the number of tourists visiting Indonesia. The current communication technology enables to support collaboration between websites so as to increase access the tourism promotion and marketing. This paper aims to see the potential benefit of communications technologies that currently available to enhance web collaboration among web business actors. The method used is literature study, tourism legislation study, and field survey. The expected result is the design of the usage web communication technology which potentially increases the effectivity of tourism websites at the province level.

Framework for Analysing Web Access Logs using Hadoop and MapReduce

Pranjali Borgaonkar

Abstract: Weblog mining is a trending area of research which manages the extraction of interesting knowledge from logging data created by web servers. With the quick advancement of the web, web information mining exceptionally weblog mining plays a vital role in distinct field including customized data benefit enhancing plans, administrations of site et cetera. A few website specialists, web maintainers, website admins and web heads are unconscious of web server records, data each time they visit a site page. Essential logfile contains the data about username, IP address, Time Stamp Access request number, Number of bytes Exchanged, result status, error site pages, and URLs. Weblog documents can be utilized to give architect of site pages a substantially more detailed perspective of how clients are getting to their website. Weblog document can likewise be utilized to monitor usage patterns and employ them to enhance the outline and execution of sites. Moreover, tremendous weblogs can be utilized to investigate and upgrade an extensive variety of electronic things, for example, online instructional exercises, truth sheets, client records and exercises and so on by thinking about big data technologies. This digitally produced huge information from various sites is turning into a lot of information that the customary approach faces a bottleneck while processing such huge information. In this way, the big data is one of the answers to overseeing such sorts of things. In this paper, we propose a system for analysing web server logs of an educational organization through Hadoop and MapReduce which figures out the execution time.

Adaptive Control of Parallel Power Converters for Load Sharing in DC Micro-grid

Lokendra Singh and D.K. Palwalia

Abstract: The generation of renewable energy sources is intermittent in nature thus we need multiple generation systems and then integrate them into the grid. Distributed power generation from renewable energy sources needed so that we have a reliable power generation system. But the paralleling of these converters involves problems like power losses, circulating current. Thus, for integration of all sources, energy storage system and load, we require proper schemes and methods so that circulating current and losses can be minimized and all DGs can integrate to achieve desired voltage to at load end. The problem here is resolved by application of adoptive droop method.

Series Parallel Converter Configuration in a Grid for Power Quality Improvement and Micro-grid Application-Construction and Control Strategy

Roshan Shinde and Girish Walke

Abstract: Development of a standalone micro-grid structure within a conventional utility grid has become of vital importance, given the current scenario of power generation and its effect on The environment. The proposed system in this paper deals with a unique combination of power converter devices, placed in a series-parallel configuration along a power grid which serves two main purposes: 1) Interfacing of multiple renewable energy resources to the utility along the lines of its distribution system. 2) Improvement of power quality in the grid by compensation active and reactive power to maintain a constant voltage profile and to perform harmonic current compensation. This scheme is

useful in maintaining uninterrupted power supply in case of utility failure by supplying power to the connected loads from alternative sources connected to the converters which can be both renewable or a more conventional one like diesel powered or coal fired energy generation back up supplies. Simulated results of such a system with two three phase four leg inverter with DC source and loads is implemented to illustrate a series- parallel structure which improves power quality and reliability by acting as a micro grid within a conventional power transmission system.

Sudden Fall Detection and Protection for Epileptic Seizures

Padma Tatiparti and Ushakumari Chintalapati

Abstract: An Epileptic Seizure is a sudden and uncontrolled symptom originated in brain. They could be due to abnormal electrical activity start in brain for very brief period and also recurring seizures due to a brain disorder. Therefore during the event there is an effect due to bumps, cuts /bruises are commonly observed occurrences. The effect of injuries are seriously caused due to falling and losing alertness or realization during or after a seizure, for instance a broken bone or injury. This project used an Arduino based airbag protection system for the people suffering from seizures by using an accelerometer, which will detect the fall of the person and triggers the airbag. A push pull solenoid is used to puncture a canister that is present in the airbag. A relay is used to operate the solenoid. When the fall is detected, the Arduino will trigger the airbag. This project helps the people who are suffering from epilepsy and protect them from injuries. This project objectives to design and development of precise system for fall detection based on Arduino technology through noticeable perfection in accuracy and specificity of system. Initial phase a close approximation and selection of its relevant threshold values and prototype design. Later Phase consist of application on test subjects to visualize the accuracy in system design.

DiRetNet - A Deep Convolutional Neural Network for Determining Diabetic Retinopathy Category from Retinal Images

Akash Dabhi, Nachiket Makwana, Archit Masurkar, Sarvesh Narkar and Vaishali Jadhav

Abstract: This paper proposes a model that will classify retinal images having Diabetic Retinopathy using Convolutional Neural Networks. The model will take retinal images as input and will classify them into one of the following five categories of Diabetic Retinopathy: None, Mild, Moderate, Severe and Proliferative. Our algorithm is trained on a dataset containing 25,000 retinal images, labelled by trained ophthalmologist. This model achieves a training accuracy of 94% and test accuracy of 92%.

Simulation of Real Time Multiprocessor Static Scheduling Algorithms

Madhukumar Patnala and Ralla Nagendra

Abstract: Real Time Systems are time bound systems. Their efficiency is dependent on logical correctness as well as strict time frame within which they react to an event. Completion within deadline is stressed especially in hard real time systems. Modern embedded hardware implementations choose multiprocessor architectures to support multitasking. Multiprocessor scheduling problem can be broken down in terms of task to processor assignment prior to uni-processor scheduling problem. We can combine suitable task to processor allocation strategy to uni-processor scheduling algorithms like RMA and EDF for developing multiprocessor scheduler. This paper demonstrates simulation of Utilization Balancing algorithm for EDF, Next-fit algorithm for RMA, Bin packing algorithms for EDF using C language and TORSCHE tool box for MATLAB.

A Framework for Granular Security in Cloud Computing using Cryptographic Access Control

Aparna Manikonda

Abstract: Cloud computing services has gained increasing popularity in recent years for supporting various on demand and scalable services for IT consumers where there is a need of less investment towards infrastructure. While storage architecture of cloud enjoys a more robust and fault-tolerant cloud computing network, such architecture also poses a number of security challenges especially when applied in applications related to social networks, Financial transactions, etc. First, as data are stored and maintained by individual virtual machines so Cloud resources are prone to hijacked. Such attacks allow attackers to create, modify and delete machine images, and change administrative passwords and settings successfully. hence, it is significantly harder to ensure data security. Second, Due to dynamic and shared nature of the Cloud, data may be compromised in many ways. Last but not least, Service hijacking may lead to redirect client to an illegitimate website. User accounts and service instances could in turn make a new base for attackers. To address the above challenges, we propose in this paper a distributed data access control scheme that is able to fulfil fine-grained access control over cloud data and is resilient against strong attacks such as compromise and user colluding. The proposed framework exploits a novel cryptographic primitive called attribute-based encryption (ABE), tailors, and adapts it for cloud computing with respect to security requirements

Weather Prediction using Data Mining

Devidas Bhat and Dr.Balasubramani R

Abstract: Weather prediction has become one of the massive challenges for the meteorological department. Weather prediction is essential to take the prior steps in handling current as well as forthcoming weather condition. For this purpose, the patterns are created for the weather forecasting model from which the useful patterns are extracted using the concept of data mining. In this weather predictive model, the forthcoming weather data are estimated based on the historical values. The proposed model subsumes Hidden Markov Model for prediction and K Means clustering. The proposed model is implemented in Java and is compared with classical ID3 to rationalize. The performance is evaluated on the basis of time of computation,space complexity, error rate and accuracy of the proposed method is compared with the ID3.

A Distributed Algorithm with Rooftop Solar Photo Voltaic for Balancing Domestic Loads

Vaibhav Jain, Naveen Jain and Umesh Agarwal

Abstract: Automation and control of residential loads with Renewable Energy Sources (RES) have become an integral part of the smart grid initiatives. This paper presents a smart strategy of controlling domestic load using smart home load manager (SHLM), for automatic scheduling of appliances as per the available generation. In addition to this, a real time generation data from roof top Solar Photovoltaic (SPV) is used as RES. The SHLM automatically calculates the requirement of load and compares it with the available generation through SPV. The proposed work serves as a catalyst to promote RES with automatic scheduling using SHLM. The effectiveness of the proposed approach are demonstrated on Virginia Tech Advanced Research Institute data of appliance consumption and Poornima University data of solar roof top SPV panels.

Segmentation of Brain Lesions in MR Images

Sweta Tripathi, R. S. Anand and Eugene Fernandez

Abstract: This paper presents a new method of medical image (Brain MRI) segmentation based on variational level set for active contour model. In this approach of segmentation, image intensities are represented by Gaussian distribution with distinct means and standard deviations. Local means and standard deviations of images are effectively utilized to segment the brain MR images having intensity inhomogeneities. Additionally, this model is able to differentiate the homogeneous intensity areas having different local standard deviations. This model is tested for brain MR images having different types of abnormalities like Hemorrhage, Infarction and Tumor.

A Comparative Analysis of Skin Cancer Detection based on SVM, ANN and Naive Bayes Classifier

Bethanne Janney and S.Emalda Roslin

Abstract: Skin cancer cases have grown worldwide, and it is by far the most common of all cancers. It is caused by the extended exposure to harmful radiations from the sun. In the United States, they were the cause of less than 0.1% of all cancer deaths. The three main types of skin cancer have become more common. Skin cancer can be broadly classified into two categories as melanocytic and non-melanocytic (benign). Most common approach to detect malignancy of skin is by visual inspection performed by an expert dermatologist using a set of specific clinical tools. This paper describes novel image processing approaches for skin cancer detection using dermoscopy images. The purpose of this work is to analyze and propose an algorithm for skin cancer diagnosis that is able to classify lesions as malignant or benign melanoma in terms of accuracy, sensitivity, and specificity. Initially, the image samples showing melanoma are obtained by using dermoscope and segmented. It is then given for feature extraction and the results are classified using Support Vector Machine (SVM), Artificial Neural Network (ANN) and Naive Bayes Classifiers.

Comparison of Neural Network Approaches for Flood Forecasting: Case Study of Cauvery Basin, India

Puneet Misra and Shobhit Shukla

Abstract: Forecasting and prediction have been significant area of study for researchers since very past. Out of various approaches, soft computing data driven models are very useful for forecasting. Soft Computing Models are usefully applicable when the relationship between the parameters are very complex to understand. India a disaster prone country which requires such major soft computing based data driven models to handle disasters like flood, drought, landslide etc. Flood has a major impact in many regions of India out of which Cauvery, Godavari and Ganges river basins are the mostly affected regions. The paper attempts to forecast floods by modeling river flow in the area of Godavari river basin of India which has a complicated topography. In this study, the potential of two data driven techniques Artificial Neural Networks (ANN) and Support Vector Machine (SVM) was explored for forecasting floods by predicting river flow in Cauvery river sub-basin of southern India.

A Clustering-based Framework for Avoidance of Multiple Attacks in Wireless Network

Jitendra Kumar Gora and Nidhi Nigam

Abstract: Mobile Ad Hoc networks (MANETs) are wireless networks which does not require any central administrator for communication between mobile nodes. Due to its open architecture, MANET is vulnerable of various security threads launched by attacker nodes or intruders. In this category network layer attacks are very serious attacks which exhaust the resources of the network and interrupt the communication by dropping the packets as well. Proposed scheme considering three important network layer attacks i.e. Wormhole, Flooding and Black hole attack. Wormhole attack is considered as the dangerous attack in the network, importantly in ad-hoc wireless routing and wireless security system. RREQ Flooding is again a type of attack, in which a malicious node block the valid communication of the entire network by flooding a huge amount of fake RREQs to all nodes in the network, thus degrading the performance of resulting network. This attack is of three type Hello packet, Route Request (RREQ) packet and Data packet flooding, to identify neighbors. Another security threat is black hole attack which is a serious assault that can be easily active towards AODV protocol. The central research dilemma is how to provide security protection to the network topology and the routing process in a wireless network. Thus an efficient technique, which must be able to avoid these serious security threats, is needed. In this paper we analyses the impact of these attacks on network and proposed a novel mechanism i.e. cluster based avoidance technique. This technique is unique in terms of dynamic infrastructure and provides route security due to clustering. The simulation result shows that the proposed mechanism gives better performance under these attacks in terms of Packet Delivery Ratio, Throughput and Routing Overhead.

Transparent Neuro-fuzzy Rule-based Classification System

Heisnam Rohen Singh and Saroj Kr Biswas

Abstract: Regularly evolving technology continuously generated enormous amount of data. Many information and knowledge are hidden within these data. For efficient used of the hidden knowledge, they should be understandable i.e. transparent, to make new business strategies. One of the data mining tasks which provide a deep insight into the underlying system is classification. Many techniques are used for classification however for explanation in human understandable form neuro-fuzzy technique is most suitable. Many neuro-fuzzy models were proposed for classification yet they still focus on the accuracy, not on the transparency of the system. In the neuro-fuzzy system, the linguistic variables used to interpret the input and the IF-THEN rules are most important for transparency. In this paper, a neuro-fuzzy system is proposed for classification in which significant linguistic variables are generated by a clustering technique and simple IF-THEN rule is produced for classification. Nine benchmark datasets are used to test the performance in term of accuracy and transparency of the proposed model. It is observed from the experimental results that the proposed system provide better accuracy and transparency than the other existing neuro-fuzzy systems.

Comparative Analysis of PI / PID Controller for a Thermal Process Using PLC

Manivasagam Rajendran and Gabriel Santhosh Kumar

Abstract: This paper presents the comparative analysis of a versatile PID controller and PI controller to control a thermal process using the PLC ladder functions and hardware interface in a closed loop

system. The Cohen-Coon's PRC method is used for setting the PID and PI control Parameters. The proposed control algorithm is experimentally implemented on the heater-furnace-blower method also the results are presented. The ladder functions of GE Fanuc Versamax PLC is used to develop the control algorithms namely, position-form and velocity-form algorithm. The performance of the complete algorithm for the PID and PI using PLC on the heater-furnace-blower system are tested at different sampling instants and the experimental results are compared with the response of the same system with the position-form algorithm developed using the same PLC and the developed PID and PI function block in the PLC. It is observed that the velocity-form PID and PI control algorithm is capable to follow the factor variation rapidly and perform better in load disturbances. This approach helped in maximize consumption of the PLC ladder function and provides more flexibility by those PLCs, which do not maintain prepared PID loops.

Web Page Recommendation System using Artificial Neural and Semantic Network

Megha Raghu and Megha Vashisht

Abstract: Web miners are elaborating the various field of research out of those user task based behavior learning is new area of research. So reducing the load on the servers is prior requirement of the work by analyzing the user task behavior. Here proposed work used neural network for finding the web log counting. This neural network based pattern generation reduce the execution time of finding the relevant pattern. In this work semantic network of web page content keywords are prepared. So use of web log and content feature with proper model increase the accuracy of prediction. Results shows that proposed has achieve a high precision, accuracy. Proposed scheme reduce searching time as classification is done by trained artificial model.

Design and Implementation of a Homemade Remote Control and Obstacles Avoidable Fire Extinguisher Robot

M. I. Haque, G.Martuza Chowdhury, Rafidul Islam, S M Rezwanaul Islam, M.S Anower and Mozammel Hossain

Abstract: The aim of this project is to develop a fire extinguisher robot and its operation is controlled by using IR remote. This robot is loaded with the tanker and a pump and sprinkles water to fire. It is a micro-controller based robot. The robot can automatically sense and overcome obstacles on its path. It has the ability to detect any flame. At the transmitting end using push buttons, commands are sent to the receiver to control the movement of the robot. We can use this robot to fight against fire and to minimize the losses. The robot is used to fight the fire where the humans can't enter. This can be kept in industry, office, home for the safety against fire. The robot can show the actual situation by using a wireless camera.

Analysis of Movement of Metallic Particles for 400 KV Segregated Gas Insulated Substation using Different Numerical Methods

Giri Prasad Ambati, Dr.Poonam Upadhyaya, Dr.Surya Kalavathi Munagala and Karthik Nachagari

Abstract: This paper presents the analysis of motion of metallic particle in a Gas Insulated busduct (GIB) for 400 kV segregated Gas Insulated Substation (GIS). GIS systems face many problems and one of the major problem is particle contamination which cripples the Dielectric capability of the insulating medium (SF₆). A contaminating metal particle may act as a bridge for the spark gap which

eventually leads to the failure of GIS systems. CIGRE group suggested that of all the cases of insulation failure in a GIS, metal Particle contamination alone is responsible for more than 20 % of the failures. The movement of metal particles in a GIB is mostly dependent on the localized electric fields in the duct. The model of a GIB has been simulated and the metallic particle trajectory for Al, Cu and Ag has been calculated up to withstand voltage (650kV for 400 kV GIS) with updated standards. The results have been validated by using Analytical method, Charge Simulation method and Finite element method. The three methods have been compared and analysed.

Solar Energy Prediction using Meteorological Variables

Devangi Solanki, Utsav Upadhyay, Siddhi Patel, Reema Chauhan and Shubhangi Desai

Abstract: The remarkable increase in per capita power consumption worldwide has drawn attention towards the required growth in renewable energy sector in order to bridge the gap between overall demand and supply. Solar power has been the fastest growing source of energy throughout the world outstripping all other forms of power generation. Though Solar PV system is recognized as promising renewable energy technology it is burdened with few uncertainties and drawbacks. To make interconnected grid system more resilient it is necessary to do solar energy generation forecast which is under acceptable limits. This paper presents a solar energy prediction model consisting of a mathematical model which enables to compute the amount of solar energy generation for next seven days (including present day) by considering weather data and plant specifications. The factors that affect the solar energy generation are ambient temperature, solar irradiance, efficiency of panels, and efficiency of plant components like: inverter, cables, type of PV module installation etc. The graphical results indicate the fine parallelism between predicted results and actual output concluding high accuracy except for the climate situations observed such as partly cloudy or overcast and during plant malfunctioning in terms of string failure.

Rectangular Slotted Microstrip Antenna with Linefeed for Amateur Radio Operations

Mahesh Manik Kumbhar, Dr. Satish Tanavade and Pradnya Ravindra Narvekar

Abstract: The modern trends in wireless communication systems require wide bandwidth antennas, by which the voice, data, and video information can be transmitted. In the present work the wideband microstrip rectangular patch antenna is designed by considering microstrip feed line technique. The antenna is designed by taking Rogers RT/duroid 5880 (tm) substrate with $\epsilon_r = 2.2$ & resonate at 10.1 GHz. By inserting slots on the patch we have to determine the effect on the bandwidth of the Antenna. The developed antenna is simulated by using Ansoft HFSS.

Industrial Surveillance Video Analysis using Compressed Sensing

Unnikrishnan K T and Byjubai T P

Abstract: The development of complex video surveillance and traffic monitoring systems has recently attracted interest from the industry and research community due to increased availability of low cost sensors and processors and increasing concerns for safety and protection This paper offers a novel video analysis method based on the Compressed Sensing and Gaussian Mixture Model shadow removal. Compressive sampling or Compressed Sensing is a new signal acquisition technology that can almost take over Nyquist sampling method. The shadow of moving object present in the video stream is first removed by GMM Shadow removal method. Every frame is then sensed or sampled by

Block compressive sensing (BCS) using a random Bernoulli's matrix as sampling matrix. For further data reduction compressive sampling in different transform bases like DFT, DWT-haar, DWT-Db are carried out. Key frames are reconstructed using the algorithms l_1 minimisation, Matching Pursuit, Block Sparse Bayesian Learning algorithms. Simulation results demonstrate that Block Sparse Bayesian Learning algorithm based reconstruction outperform other techniques.

Subject Selection for Secondary Education; Available Resources and Future Challenges

Kapil Sethi, Gaurav Gupta and Varun Jaiswal

Abstract: Education is a significant factor to build a strong ground of the nation. To ensure this, accurate education schemes are required to help the student to choose an appropriate career. One of the most important factors of the dropout level is the selection of inappropriate subjects by students. Educational institutions and government bodies are provided with limited efforts towards developing new schemes to the education system. The available resource for students to select subjects/stream to pursue further education includes teachers, parents, directional guidance, online career support and career counseling. Although these resources have a specific limitation like higher cost and time. Finally, these resources are not based on scientific calculation and data of successful scholars of their domain. So there arises a need of such a support system which is a combination of data mining and machine learning, which can replace human efforts. The achievement rate of such support system would be high, accurate, scientific and accessible to all.

An Applied Survey with ESP8266 Lolin + Shield Base with Nextion Touchscreen Display

Antonio Carlos Bento

Abstract: This manuscript presents the results of an applied survey on the Internet of Things (IoT), considering the use of the Lolin ESP8266 devices with Shield base and Nextion touchscreen display. Considering the scarcity of scientific research materials that involve the subject of Internet of Things, considering as main objective: to demonstrate the results of technical applications, in which it is necessary to create solutions for automation, contributing to the development of solutions that can as a basis for future studies, with content that can support more sophisticated scientific research projects. The results of this study made possible the technical understanding for the creation of projects that can serve different areas, such as automation, monitoring, security, remote operations, facilitating the remote control of devices or Internet, equipments with portability in different environments, such as smart phones, computers and tablets.

An Experiment with Arduino Uno and Tft Nextion for Internet of Things

Antonio Carlos Bento

This manuscript presents the results of an applied research on the Internet of Things (IoT), involving automation and control of objects at a distance, as general objective should be presented the results of a technical experiment, considering an application with devices used for automation, such as devices Arduino and the Tft Nextion display, which provided the development of the project in a practical way, demonstrating the facilities and possibilities for the construction of solutions for IoT, the results

demonstrated the possibilities for the development of a simple project, but that could contribute to the studies and creation of more robust solutions, due to the lack of scientific bibliographical references on subjects that involve the Internet of Things, mainly the display devices Nextion.

Defected Ground Structure in the Aspect of Substrate Integrated Waveguide Circuits: A Review

Padmini Nigam, Santasri Koley and Arjuna Muduli

Abstract: This review paper described about the developing area of microwave based upon waveguide, which is kind of guided media to communicate from source to load side. Previously, rectangular waveguide mostly used for communication, but due to disadvantages of it's such as highly weighted, larger size and based over system in package (SiP) concept. For the improvement of above disadvantages, substrate integrated waveguide is introduced with better Q factor, small size and concept of system in package (SiP) extended to system on substrate (SoS) technology. To get higher Q factor like rectangular waveguide with improved performance of all features for this, DGS technology introduced to provide small size, light weight, low cross polarization, low mutual coupling with enhanced radiation property.

A Study on Automatic Latent Fingerprint Identification System

Uttam U. Deshpande and Dr. V.S. Malemath

Abstract: Fingerprint has been most popularly used biometric in many commercial applications for person identification. Latent fingerprints are being used in many law enforcement agencies to identify victims and suspects for several decades from now. It has been used as evidence in the court of law for over 100 years. Lot of research is happening in the field of latent finger print identification system. National Institute of Standards and Technology (NIST), USA observations have revealed that the performance of different state of the art latent recognition systems is far from satisfactory. This is because of the presence of noise, distortion, low information, non standard procedures and lack of publicly available latent database make design of latent fingerprint recognition system very challenging. Hence, there is a need for designing a highly accurate automated latent fingerprint recognition system to compare latent found at crime scenes with a large collection of reference fingerprint database. Generally, automatic latent fingerprint recognition system can be divided into five different stages. This paper brings out the details of the existing algorithms, limitations, available state-of-art algorithms and research opportunities in each of the stages.

IoT based Semi-automated Military Combat System

Dr. Layak Ali and Apoorva Joshi

Abstract: Internet of Things (IoT) and Robotics are trending areas in the present era. Use of robots for various application is realized since many years including military surveillance. Harnessing the features of these areas, a system for military applications is developed. The system is imbued with many features. It is semi-automated and can be remotely controlled by user through web interface. It also includes live streaming of video over the network to the remote users as captured by eye of the robot. The system is automated to detect any intruder/enemy in its vicinity and stops in its presence. Action against the enemy can be initiated by the user. In absence of user, the system is designed to take predefined path as well detect the intruder. All the functionalities are implemented using a Real

Time Operating System (RTOS). Incorporating this kind of unmanned system in the battle field or border patrolling can save lives of many soldiers who become victims of the assailant.

Optical Character Recognition based Zooming

Vipin Anand and Ankit Navik

Abstract: Internet of Things (IoT) is seen as one of the advance paradigm in widespread applications, and also in upcoming generations of information and communication technologies (ICT) with numerous devices from handheld to smart bill board (public displays). The use of expressing one's view in pictorial way has increased drastically. Currently, there are numerous application where text in video plane plays vital or trivial role along with other content. However, sometimes even though size of characters in video plane needs modification (zoom in or zoom out), It cannot be done due to lack of technique to do so. We propose a novel mechanism to modify text sizes (Zoom in or Zoom out) in streamed/real time video. There are several zooming techniques available but use of them would potentially affect visual experience (Zoom in would result in loss of content and Zoom out would in degradation in video quality). Proposed solution uses k-NN algorithm (Optical Character Recognition based algorithm) to find coordinates of area which contains characters in video plane and this coordinates can be used to create texture out of video plane to perform zoom in or out operations.

Automatic Investigation of Micronutrients and Fertilizer Dispense System using Microcontroller

Arun Patokar and Dr.Mrs. Vinaya Gohokar

Abstract: Quality of the soil is a measure of soil fertility, observing the nutrients in the soil leads to plant life prediction, if the amount of macro and micronutrients, pH, and water measured then one can predict the fertility and protect plant life. Harvesting process change the soil nutrients and they get depleted hence replenishment is necessary, in this paper we propose design of a system which will detect the soil nutrients and necessary will automatically dispense the fertilizer in the soil, in general situation farmers add fertilizers manually, but the amount may not be proper, inappropriate quantity can harm the life of plant and cut the yield too. The proposed research solution aims to restore the level of phosphorous, potassium & Nitrogen by measuring soil nutrients using a chemical process by using some sensors and adding the proper amount of fertilizers in the soil to support the plant growth and achieve better yield, this automatic detection and dispensing of fertilizers leads to solution for avoiding excess/deficient fertilizers in soil.

Developing a mobile APP for Inquiry-based Learning about Insect Worlds

Ah-Fur Lai and Chi-Rui Hong

Abstract: Mobile and ubiquitous learning becomes a new trend on education all over the world. How to provide the learners with suitable mobile APP in their learning process is an important task for most of learning domains. As a result, the main purpose of this study is to develop a mobile APP for helping the learner of elementary school to do their inquiry-based learning about insect worlds. This study use NFC to construct a situated inquiry learning environment when exploring insect worlds at outdoor learning activities. The APP consists of six modules including quiz, NFC-based game, taking picture, discussion, Kelly grid, and mobile-based learning content. After finishing the APP and server-side

management system, this study employed instructional experts to evaluate its suitability on nature science learning of insects. The results revealed that the experts show high appraisal toward this APP. afterwards, this study conducted a learning experiment in an elementary schools for investigating its learning effects. Although its effect is insignificant between traditional learning method and mobile learning approach, the learners had high willing to use this APP to learn and explore the insect topic.

Modeling and Simulation of Single Phase Photovoltaic Five Level Cascaded H Bridge Inverter using Matlab

Komal Teli and Shobha Savanur

Abstract: The main intention of this project is modelling of single phase five level cascaded H bridge inverter. This kind of energy conversion systems are fastest growing energy systems of last five years, mainly in the grid connected photovoltaic system area. Cascaded H bridge converters have more attention due to their medium voltage operation, high efficiency and improved power quality. This inverter gives five levels of output voltages. And the results of this inverter is simulated MATLAB Simulink.

Reduction of ISI by Beamforming Transmission in IEEE802.11ac

Balwant Singh, Vinod Shokeen and Rishi Asthana

Abstract: Device to Device (D2D) communication is very demanding technology for today's communication system due to heavy traffic of data and voice. So there must be improvement in spectral efficiency and system capacity. Higher order modulation technique in wireless communication system can increase the system capacity. But the major problem is Inter Symbol Interference (ISI). This paper is going to reduce effect of ISI by transmission of beamforming in IEEE802.11ac. Result shows improved SNR when transmission is beamformed compared to spatial expansion transmission. There is increment in the received power so this technique also provides more reliable demodulation for higher order modulation and coding schemes, used for the transmission.

Developing New Hybrid Cryptography based Security for Cloud Computing System

Narmadha R

Abstract: In this age of cloud computing, we tend to store data which we need frequently in web based cloud storage services so that it can be accessed whenever we need them. This not only provides an immense amount of flexibility to users, but also makes our content accessible to us wherever we are and whenever we need them. We have many options in terms choosing web based cloud storage services for backing and archiving our data. There are many web based cloud storage services available out of which Amazon S3 and Google Drive are immensely popular among users. Backing up files so that they are not lost is an all-important step to ensure that nothing is ever lost. But, moving to the cloud is itself a big change and there are real concerns that make people pause before they sign up for any such service. This paper proposes and implements an algorithm which would encrypt the files uploaded on such web based cloud storage services and would decrypt the file once it has been downloaded using the keys that were generated during encryption. This would prevent unwanted intrusion into personal data and lack of standardization, i.e. one service provider may have end-to-end encryption while others do not.

Performance Analysis of CP-Reuse based Estimation Technique for High Mobility Node

Sandeep Sarowa, Naresh Kumar and Sunil Agrawal

Abstract: Orthogonal frequency division multiplexing (OFDM) bears most desirable features that make it fit for adaptation to the breakthrough technologies, like LTE, LTE-Adv, IoT etc. Bandwidth scarcity and high speed communication are area where most of development aligned in the current era of mobile telephony. CP-Reuse based Estimation technique gives a bandwidth effective and energy efficient solution to fulfill the demand of current mobile network expansion. Highly efficient technologies deemed fit to support multiple applications realized over OFDM to deliver high performance in terms of throughput and data speed. This paper presents the performance evaluation of CP-Reuse based Estimation technique to control Inter Carrier Interference (ICI) over a high mobility node under AWGN channel. A comparative analysis against Self-Cancellation (SC) and Maximum Likelihood Estimation (MLE) techniques demonstrates the high bandwidth gain and superior BER performance to justify the performance enhancements over high mobility environment.

Power Conditioning of Microgrid by Using a Fast-Acting DC-Link Voltage Controller for 3-Phase D-STATCOM

Shravani Kakkerla, Prof. S.S Thulasiram Sankara and Dr.A.Srinivasula Reddy

Abstract: Microgrids are systems with clusters of micro generators, which are installed for distributed power generation. When interfaced to the utility grid, microgrids are exposed to common utility power-quality disturbances. The paper focuses on the combination of wind, FC and for sustained power generation. We propose herein a dynamic model, design and simulation of a wind/FC/ hybrid power generation system with power flow controllers. This paper presents a novel D-Statcom configuration for voltage quality improvement in MICRO GRID. The transient response of the distribution static compensator (DSTATCOM) is very important while compensating rapidly varying unbalanced and nonlinear loads. Any change in the load affects the dc-link voltage directly. The sudden removal of load would result in an increase in the dc-link voltage above the reference value, whereas a sudden increase in load would reduce the dc-link voltage below its reference value. The proper operation of DSTATCOM requires variation of the dc-link voltage within the prescribed limits. Conventionally, a proportional-integral (PI) controller is used to maintain the dc-link voltage to the reference value. It uses deviation of the capacitor voltage from its reference value as its input. However, the transient response of the conventional PI dc-link voltage controller is slow. In this paper, a fast-acting dc-link voltage controller based on the energy of a dc-link capacitor is proposed

A Novel Technique to Improve Performance Evaluation of Domino Logic Circuits in CMOS and FinFET Technology

Abhijit Kumar Singh and Uday Panwar

Abstract: As the silicon industries miniaturizing the device size and increasing the performance day by day to implement more functionality in digital ICs. In this paper, various design techniques for implementing domino logic circuits are discussed. A new technique is also proposed in order to reduce power consumption without degradation of performance of the circuit and increase the robustness of the circuit. Here we have use eight and sixteen input OR gates to calculate the UNG of the circuit with existing and proposed design in CMOS, and FinFET technology. FinFET devices have excellent

performance improvement and low power characteristics which results in higher ION/IOFF ratio and suppress the leakage current and faster the switching speed of the circuit. Simulation is done on PTM 32nm process using H-spice C-2009.09-SP1 simulation tool on a dc supply of 0.9 V at 100MHz frequency. FinFET based Domino logic saving of standby power of 18.79%, 29.36% SFD, 46.15%, 42.11% HSD, 63.3%, 61.46% CKD, 49.08%, 29.18% DFD for the 8 input OR gates in SG and LP mode of FinFET, respectively.

A MATLAB based Study on Inductively Active Filtering Method for Power Quality Improvement of Grid Connected PV system

S Deokar

Abstract: This paper presents a novel inductively active filtering method for power quality improvement in today most promising area in energy sector of PV based grid tied systems with presence on non-linear loads in the system. A detailed comparative analysis between traditional active filter and the proposed method is discussed in the paper under various configurations. The PQ controller is applied as the controller strategy in this approach. This approach is verified using MATLAB/Simulink and the results suggest that the inductively active filter with extended delta winding gives best performance among studied methods for power quality improvement not only of the source current but also helps in reducing THD% of the current flowing through the primary side of the converter transformer. This method thus aids in improving the life of converter transformer connected near the load side and avoids its deterioration due to harmful effects of harmonics flowing through it.

Task Scheduling with Load Balancing on Automotive Multicore ECUs

Geetishree Mishra and Rajeshwari Hegde

Abstract: In order to achieve greater performance with low power dissipation at moderate clock rate which is required to reduce the electromagnetic interference and compatibility issues with high speed processors, multicore processors have been implemented in automotive electronic control units(ECUs). Multicore processors enable the automobile manufacturers to add more functionality into one ECU rather than integrating more number of single functional ECUs. With the introduction of multicore processors in automotive ECUs, complexity in the design, development, and verification of the applications software have been increased tremendously. Even though both the hardware and software have parallelizability, there are certain design challenges such as: integrating various application software and scheduling the application tasks to balance the load across the cores. It requires to sequencing threads within the chained tasks, segregating those into thread sets and allocating to the available processing cores. In this paper, we address the problem of clustering numerous task threads and allocating them on multiple identical cores. We present a low-complexity modified heuristic algorithm to partition and build thread sets and map those on to cores so as to balance the load across the cores. It is observed that, minimum average load of the total load is distributed to each core to achieve a balanced load with task scheduling in simulating environment. The performance of the algorithm on dual core, tri core and quad core processors have been verified and compared to the same on single core processor

Blood Bank: An Application to Manage Blood Bags

Mukta Desai, Anand Hiremath and Netra Toravi

Abstract: There is difficulty in maintaining blood bags therefore many golden lives could be lost, so the main aim is maintaining blood bag and It is web based system; It help in recording of blood bags and stocks. Earlier days there is shortage of blood bags due to the misconception of donating blood. If any person requires particular type of blood then it is not available in blood bank so time is consuming it is very dangerous in critical conditions. proposed web application maintains blood bags, storage of blood bags.

Analysis and Characterization of Switched Reluctance Motor using Four Quadrant Operation

Bhagyashree Mahajan

Abstract: The switched reluctance machine (SRM) is accepting restored consideration as a feasible contender for different movable speed and high torque applications, for example, in the car, footing and aviation enterprises. The special component of a SRM is its moderately straightforward mechanical structure; the rotor does not convey any windings, commutators or changeless magnets. This proposal displays a four-quadrant task SRM drive system with a solitary controllable switch for two stage design. The SRM's arrangement has four primary stator shafts, four rotor posts, and four assistant stator shafts. In view of this unique course of action, a four-quadrant task with a given power converter topology and proposed control calculations has been figured it out. The focal point of the paper is to understand a four-quadrant activity with a solitary switch converter based SRM. Likewise, this exploration brought about another self-beginning plan without including changeless magnets. Simulation comes about using the control calculation check the execution of the system.

Analysis of Performance of VSC based HVDC Power Transmission System by using 9 Bus 3 Generator System

Pratiksha Shinde and Jagdish Helonde

Abstract: In this paper a modified design of HVDC power transmission system with VSC by using 9 Bus system is given. An over-all stage is presented to learn the high voltage dc transmission links which is the subtleties of power systems. Small-signal stability, interaction phenomena, and voltage stability of power systems with voltage-source- converter HVDC (VSC-HVDC) are spoken using the proposed platform. In journey of high efficiency, power density and problems of bulk/high power transmission over long distance, prerequisite of full control over power transmission and increasing attentiveness to unite renewable energy source into the grid has controlled to develop a new age of high voltage direct current (HVDC) transmission system. VSC based HVDC transmission is one of the HVDC conformation. Their high efficiency, compact size, high reliability, short installation and appointing period and low operating and maintenance cost make it suitable choice for HVDC transmission. The HVDC system with power converter acts as a backbone and provides high reliability with a long useful life to support the AC electrical system. The power conversion i.e. rectification or inversion is achieved by electronic switches which is controllable in a 3-phase bridge structure. The wide spread use of AC-DC converters for various applications has resulted in power quality pollution leading to failure of sensitive equipment's, reduced efficiency, etc.

Pedestrian and Vehicle Detection in Automotive Embedded Systems using Deep Neural Networks

Parampreet Kaur and Rajeev Sobti

Abstract: Pedestrian and vehicle detection by autonomous cars is an emerging area of research in the automotive community. The perception system of intelligent vehicles gathers data from sensing devices to understand and analyze traffic situations. This cognitive intelligence is required to make efficacious real-time decisions to avert imminent collisions with vulnerable traffic users such as humans, stranded or moving vehicles, cyclists or other static obstacles. This paper addresses the problem of people and vehicle detection using deep learning models such as convolutional neural networks. The results provided an incredible evidence that Deep neural networks have a significant potential for solving problems related to intelligent transportation systems. Higher rates of accuracy have been achieved by adding multiple hidden layers. The Keras based architecture along with Tensorflow libraries have been used to implement the algorithm.

Stability and Performance Analysis of Low Power 6T SRAM Cell and Memristor based SRAM Cell using 45NM CMOS Technology

Seelam Vasavi Sai Prabhu Deva Kumar, Shaiwal Suman, Arup Sarkar and Vivekanand Kushwaha

Abstract: In recent years, there has been a growing demand for low-power devices, due to the fact that the expansion of CMOS technology. Scale, the crystal size corresponds to the SOC storage phenomenon, system-on-chip (SOC), decreased by the number of transistors increased. Overall, the number of transistors in the number of transistors on a chip of information is used for various functions. They need economic, low energy consumption to promote the design capacity to increase, low power consumption and little memory because it plays an important role for the growth of the overall energy consumption device design parameters playing tight leakage power devices. Although it can be used any bit of the flip-flop - hitting the SRAM-type semiconductor SRAM: this memory is turned off to the loss of data in the conventional sense. It is used to compare the results of the memristor SRAM and SRAM. The calculation is simple memristor SRAM and SRAM based on the design parameters in 45nm technology, the Cadence tool.

Fully Informed Particle Swarm Optimization for Solving Economic Load Dispatch

Shivam Verma, Sarthak Bhatia, Khushboo Verma, Shweta Verma and Asif Iqbal

Abstract: The allocation of required load between the available generation units at minimum cost is known as Economic Load Dispatch (ELD). ELD is a non-linear constrained optimization problem having both equality and inequality constraints. In this paper Fully Informed Particle Swarm Optimization (FIPSO) is proposed to solve ELD problem minimizing fuel cost considering valve point effect. Obtained results are compared with the results obtained by classical Particle Swarm Optimization (PSO) and Flower Pollination Algorithm (FPA). The proposed approach outperform other approaches in terms of power losses and cost minimization

Design and Interfacing of I2C Master with Register and LCD Slaves

Sainath Chaithanya Aravall, Sindhuja Dharra, Bhavana Dablikar and Vennela Paithari

Abstract: One of the foremost well-liked Serial communication standards I2C a bus protocol developed by Philips Semiconductors for exchange of transactions among the peripherals residing on constant circuit card. It supports communication between multiple masters with multiple slaves by employing a two-wire duplex serial bus, one for data and further for clock, emphasizing simple and economical technique of information exchange. This work involves I2C controller interfacing with two slaves, one is register memory makes data to write or scan from, followed with implementation of single master I2C on Spartan 3E FPGA such that LCD acting as slave2 for effective read/write operations. The entire module developed in Verilog, simulated in ISim 10.0b and synthesized by XST of Xilinx ISE14.4 tool.

Comparative Analysis of Curve Reconstruction using Fuzzy C Means and Subtractive Clustering

Ajay Dureja

Abstract: Interpolation and curve fitting are the basic problems in the fields of computer graphics, image processing, and mathematical modeling of curves and surfaces. Another consideration problem in the field of reverse engineering is the reconstructing of a curve or a surface of geometric models from a point set. Curve fitting is helpful for surface reconstruction. Curve fitting can be described as computing the function g , given a set of input data sample points and to generate outputs corresponding to the inputs which is not specified earlier. There are various curve reconstruction techniques available and having their own advantages and disadvantages. In this paper, we try to find and simulate these techniques by making comparisons between some curve reconstruction techniques using clustering.

Stop Word Removal Algorithm for Tamil Language

Mercy Evangeline M and Dr. Shyamala K

Text mining is generally defined as the process of deriving high-quality useful information from text. Text is normally structured, semi-structured or unstructured. When the data is unstructured, the data doesn't have a defined pattern. They have to be processed before it can be used for information extraction. Preprocessing step is an important step in the process of any data. It generally involves transformation of raw unstructured data into structured format which can be used for different purpose like sentiment analysis, text categorization, and text analytics and so on. Preprocessing plays an important role in any mining process. This work implements stop word removal based on list defined in the form of dictionary. The dataset mainly includes Tamil text files maintained in UTF format.

Modeling Methodology for Oil Production Wells with Electrical Submersible Pumping using the System Identification Theory

Jorge Andres Prada Mejia, Luis Angel and Julian Andres Peña Florez

Abstract: This article presents the selection of a model for the system consisting of the reservoir, the well and the electrical submersible pumping, which constitutes the starting point of an identification methodology proposed for this kind of system. The identification procedure follows a series of steps

that include an initial parameters setting, operational data preprocessing, unknown parameters estimation and validation of the resulting model. The methodology was described as a standard procedure to use in different identification cases. In particular, it was implemented for a real case obtaining an identified model that was then validated according to the quality of the fit, demonstrating its utility. This practical approach considered facts as the operational data availability and the model utilization in simulation and implementation environments, showing the feasibility to use it to represent the system, especially in applications that require the control of it or the prediction of its behavior.

Optimal PMU Placement for Observability of Power System Network based on Critical Bus Ranking

Chandana Sushma Garaga and Jyothsna T.R

Abstract: This paper proposes a strategy to find critical buses considering a New Voltage Collapse Index (NVC) which depends upon the reactive power change at load. The problem is constrained to locate Phasor Measurement Units (PMUs) in network utilizing Generalized Binary Integer Programming (GBIP) method according to ranking of critical buses provided by NVC. Contingency cases like PMU loss or outage for single line are formulated to optimize locations for PMU placement (OPP). Zero Injection (ZI) model is formulated to minimize locations in network for PMU Placement. ZI modeling in case of normal and outage conditions is compared to show its efficacy. Bus redundancy is computed at every bus of the network and performance of observability of network is checked with Complete Network Observability Index (CNOI) approach. IEEE 14-, 30-, and 57-bus networks are tested with MATLAB programming with proposed method and are compared with existing methods available in literature to show its effectiveness.

Comparison of Simulation Tools for BCD Integration

Mukula Reddy, Manojkumar Reddy, Jhansi Lakshmi and Manikanta Tc

Abstract: This paper investigates on how Sprocess from Sentaurus compare against TSUPREM-4 simulation doping profile and fit Silicon data and/or SIMS (Secondary Ion Mass Spectrometry) profile. Currently, TSUPREM-4 has been using for process simulation for device design. But for BCD(Bipolar CMOS-DMOS) integration there are many new SOA (Safe Operating Area) features such as HCI (Hot Carrier Injection), HTRB, UIS etc., are required for reliability design which are available in Sprocess. Sprocess have the updated models available for device simulation. In this study, we have investigated on some critical doping processes such as tilt implantation. P-top with the deep Nwell for LDMOS and low energy, low dose doping for short channel CMOS logic process. We have found both as-implant and post diffusion profiles are not similar due to the different algorithm and point defect maps post implantation. The effort has been made to calibrate profiles against both silicon data and SIMS profiles. We report the final results seem to indicate Sprocess requires Silicon calibration or SIMS profile comparison for these critical processes for future BCD process integration Work.

Time Synchronization for CoAP-based Home Automation System

Vishakha Khatade and Anuja Askhedkar

Abstract: The demand for time synchronization in low power sensor modules is increasing with the increase in the approach for Internet of Things (IOT). Since sensors in M2M usually make use of low cost and low-performance processors, it is difficult to use the existing TCP/HTTP standard. The Constrained Application Protocol (CoAP) developed by IETF is a specialized web transfer protocol for use with constrained nodes and constrained networks. The time synchronization protocol such as

NTP, TPSN, RBS, etc cannot be applied to home automation systems due to its limited computing resources.

This paper proposes a time synchronization module for home automation system based on CoAP, which can help to reduce the network overhead and minimize the resource usage. The obtained results are compared with HTTP which shows that the proposed time synchronization in CoAP is better than in HTTP.

Design and Analysis of an efficient 3D – NoC (Network On - Chip) Router

Veadesh B and Venkatapragadeesh B

Abstract: The SoC (System On-Chip) is where the most extreme innovation is packed into the least possible conceivable space on a single chip. As the systems intricacy increase and will with time as per Moore's law, several challenges are being faced by the designers such as meeting the scalability of the systems, heterogeneousness of the whole bundle with different library files and coding dialects should be bundled together, synchronizing different clock domains across the systems as different systems use different clocks, de-skewing global and regional signals with high fanout and issues in coupling the systems. In SoC, there is a high complexity due to the inseparability of the computational processes and routing. NoC (Network On-Chip) presents a proficient instrument for routing which overcomes the shortcomings of the traditional buses and interconnects to allow efficient communication across the IP (Intellectual Property) cores in SoC devices. It separates the processing elements and routing elements and allow them to operate independently to great extents. The arbitration schemes, Topology and switching mechanism are important aspects which have direct impact on performance of NoC. In this a paper, a circuit switching based low latency 3D NoC architecture is presented. Here mesh topology is used and there exists a Virtual Connection from any input port to any output port. This architecture mainly consists of Arbiter, Network Interface Module and Crossbar switch which are designed using Verilog HDL and implemented on Microsemi FPGA with Target device MPF300TS_ES-1FCG1152I. The results promise a low latency, low resource utilized and high throughput router design.

SQLi Attacks – A Breathing Threat to Web Application Security

Dr. Arvind Sharma, Chandershekar Sharma and Ashwinder Tanwar

Abstract: On this cutting-edge state of affairs web application is extensively utilized for numerous motives like online searching, marketing, money/fund transfer, shopping, booking and so many to count, As consistent with growing the dependency on those applications moreover increases the assaults on these too. SQL injection Attacks - SQLIA is being a severe setback for web applications from last decade. These are the maximum ordinary form of vulnerability/flaws all through which an unauthorized person inserts its personal crafted query so as to enter the database for retrieving personal statistics concerning personal and organization information. This paper provides the in-depth analysis of grounds for the existence of these injection attacks in today's scenario like- their major causes, downside of breathing methodologies, why applying best and effective practices for protecting these internet-based applications. SQLi attacks are not today a major security threat but also to emerging new technologies too.

ECG Analysis and Automatic Detection of R-peak in MATLAB

Monika Panghal and Dr. R.K Sharma

Abstract: Cardiovascular disease (CVD) is one of the significant reasons of death around the world, so a proper tool is required to monitor the heart conditioning. ECG (Electrocardiogram) is a non-invasive

tool to measure the heart condition. This paper presents automatic detection of R-peaks in ECG by using Notch filter, a median filter with the Pan-Tompkins algorithm. The ECG signal waveform constitutes P, QRS and T wave complexes, which contains relevant information about heart rate. Naturally, the ECG signal gets contaminated by different noises, especially power line interferences and motion artifacts which must be eradicated, otherwise, it will lead to misdiagnosis. The effectiveness of this proposed module is assessed by applying recorded ECG signal samples from the MIT-BIH Arrhythmia database to the designed algorithm

MATLAB SIMULINK based ECG Analysis and Detection of R-peaks

Monika Panghal and Dr. R.K. Sharma

Abstract: The detection of R-peaks and QRS complexes is a vital event in almost all ECG applications. This paper presents a model of R peak detection in MATLAB Simulink based on Shannon Energy Estimation. This technique is capable of R-peak detection in a better way even in the presence of QRS complexes with negative polarities, wide or small QRS complexes, and the abruptly changeable amplitude of QRS complex. The proposed R-peak detection module contains three different stages, i.e., pre-processing, Shannon energy extraction and R-peak detection mechanism. The robustness and effectiveness of this proposed module are verified by applying the recording of ECG samples snatched from MIT-BIH arrhythmia database, and its accomplishment is evaluated in the expression of sensitivity (Se) and accuracy (Acc).

Half Side-wall Spacer Engineered Junctionless FinFET

Neha Saini and Gaurav Saini

Abstract: In this paper, an asymmetric half side wall spacer Junction-less FinFET is proposed to improve the performance of ultra-low power applications. Proposed structure improves Drain Induced Barrier Lowering (DIBL) by 68 % and Subthreshold Swing (SS) by 4.4 %. With the use of proposed structure, performance of 6T SRAM cell is optimized. Proposed 6T SRAM cell improves read delay by 12.09 % with slight increase in write delay of 1.33 % at supply voltage 0.5 V. Hold SNM improves by 6.12 % at VDD 0.5 V and Read SNM improves by 3.16 % with almost same write SNM at VDD 0.5 V.

Research and Development Procedure in Image Processing and it's Major Areas

Mohit Sanguri

Abstract: How to begin a research work? It's a first essential inquiry strikes a chord when any understudy begins their exploration work. Research work in zones required a pre-proposed procedure for satisfying. To start with research work one should initially distinguish the issue territory. At that point with the well-ordered examination, he or she turns out with some arrangement. On the off chance that it is particularly investigated the examination work achieved in the development field of computer science & technology. In this paper, we endeavored to give a well-ordered process for R and D work in Image Processing also explain its major areas, in an exceptionally straightforward way with the goal that it winds up less demanding for the analysts to begin and does their exploration work. The Research Methodology said what the development of research is, what the way by which to proceed with, how to examine progress. It gives us a progress of plenitude of human learning, devices of the

trade to finish explore, gadgets to look at things in life impartially; develops a fundamental and logical state of mind, trained reasoning to observe fairly (intelligent conclusion and inductive thinking); aptitudes of research particularly in the 'period of data'. Likewise, it characterizes the manner by which the information is to be gathered in an exploration project. The research technique in Image Processing field is discreetly not quite the same as research procedure of some other field of research.

On Efficient Scheduling Schemes in Multiagent Wireless Sensor Networks Simulation Systems

Dimitrios Karras

Abstract: Time notion is of paramount importance in a simulation process. What, how and when an event takes place in the simulation environment describes what how and when an event should take place in the real world and vice versa. The simulation tool of choice should provide the ability to minimize or even completely remove assumptions, and operate with the highest time and synchronization accuracy. In this paper we describe proper scheduling schemes that our proposed multiagent based WSN simulation system provides to handle time, and we evaluate the performance of the time controller in terms of agent population, synchronization and execution scenarios.

A Time Series Approach to Forecast Weekly Number of Cases of North West Delhi: Case Study

Kumar Shashvat

Abstract: Background and Objective In past few decades, incidences of dengue have increased rapidly. Dengue virus is caused by *Aedes aegypti*. The transmission of dengue is favored by factors like temperature, humidity, and rainfall. In recent decades, Delhi and its neighboring cities have affected from many outbreaks of dengue. The aim of this epidemic study is to forecast the number of dengue cases for future weeks and to develop a predictive model which uses historical data from dengue surveillance system. Methods We obtained valid data of weekly dengue cases from Satyawadi Raja Harishchandra Hospital, Govt of Delhi. This case study uses 40 weeks dengue fever data from the period 2nd January 2017 to 8th October 2017 for Northwest Delhi; Narela from the Dengue Surveillance System to predict the number of cases for the next weeks. Forecasting models, ARIMA and exponential smoothing are used to predict the number of cases. Meteorological data like temperature, humidity, and rainfall was also collected. Kendall test is applied to check correlation of humidity and rainfall with the number of cases. Results The predictive power of the forecasting model is checked by mean squared error (MSE), mean absolute error (MAE) and root mean squared error (RMSE). The models which have relatively lesser values of errors is better than the model which have relatively higher values of errors. These results could be used by different health departments to make early warning system to aware public. Also, push the public to do diligent efforts to reduce the transmission of dengue.

Pipelined DES Using Novel Method for Key Schedule on FPGA

Dr. Pradip Bhaskar and Miss Namrata Ugale

Abstract: Data Security is an important parameter for the industries; It can be achieved by Encryption algorithms which are used to prevent unauthorized access of data. Cryptography is the science of keeping data transfer secure This paper describes the hardware 16- stage pipelined DES Based on Variable Time Data Permutation. For the same data and key, the ciphered data is varied with time, so

the security of the algorithm is increased. In pipelined DES algorithm Novel key schedule employed here, where the sub-keys are pre-computed.

Performance Analysis of Directly Coupled Solar Photovoltaic Powered Irrigation Pumps

Maruti Naik, Basanagouda Ronad, Suresh H Jangamshetti and Shshikant Kori

Abstract: SPV based irrigation pumps are installed across India. However these irrigation pumps are not widely employed. One of the probable reasons behind this is mismatch of the need and availability of pump ratings to the farmers. Performance results of SPV based pumps vary with solar radiations, hydraulic head offered, pump rating etc. This necessitates the need for actual performance results of pumps and selection criteria.

This paper presents the detailed performance analysis of the 0.5HP, 1HP and 2HP directly coupled DC irrigation pumps installed in the Energy park, Basaveshwar Engineering College[A], Bagalkot. The system is employed with pressure sensor, flow rate sensor, speed sensor and suitable software to monitor and document the data. Performance data are logged for every 5 minutes. Results are tabulated and analyzed. Further characteristics of centrifugal pumps are drawn. The presented results can be effectively used for suggesting irrigation pump capacity to farmers.

Study of Digital Performance Parameters of Channel Engineered Junctionless Transistor

Sheetal Rani and Gaurav Saini

Abstract: In this paper, we investigate the digital performance of inverter circuit C-JLT (conventional junctionless transistor) and C-WP (Conventional JLT with pocket). For the inverter circuit, mixed mode simulation is performed to analyze different inverter characteristics such as noise margin, voltage transfer characteristics, gain, Intrinsic delay and switching characteristics. The gain and noise margin are improved for C-WP inverter compared with its conventional counterpart. However, C-JLT based inverter shows better results in terms of switching characteristics and intrinsic delay compared with C-WP inverter.

An Active Power Filter based on Three-level NPC Inverter with Fuzzy Logic Controller

Seema Agrawal, Rakesh Kumar, Vijay Kumar Gupta and R.K Somani

Abstract: Active Power Filters (APFs) have been widely used for reducing waveform distortion and improving power quality. However, it can be improved by means of a selective harmonic compensation. Since an APF is convenient to have option of selecting an individual or a set of particular harmonics in order to compensate and apply total APF capabilities to eliminate these harmonics, in particular those with a greater impact on total harmonic distortion (THD). This paper represents development of a new APF prototype based on a three-phase three-level neutral point clamped (NPC) inverter with reactive power compensation. In this paper control strategy is based on synchronous reference frame detection method to detect and control individual or a set of harmonics using d and q variables that gives a good performance particularly if source voltage is unbalanced or distorted. The simulation model is designed in MATLAB /SIMULINK simulation result in order to verify correctness and feasibility of three-level NPC inverter.

Power Quality Improvement using SAPF based on SRF with EPLL Strategy

Seema Agrawal, Deepika Sharma, Dheeraj Palwalia and R.K Somani

Abstract: This study work addresses an alternative control method synchronous reference frame (SRF) based on EPLL control algorithm for shunt active power filter (SAPF) with EPLL to improve the harmonic suppression efficiency and power quality. System is assembled by connected to a non linear load, three phase current controlled voltage source inverter (CC-VSI) based on IGBT switches, coupling inductor and DC link capacitor. The pulse for CC-VSI is generated by hysteresis controller. In this paper desired reference current is obtained for voltage source converter (VSC) of SAPF using SRF algorithm for mitigation of source current harmonic. The synchronizing circuit enhancement phase locked loop (EPLL) designing is used in shunt active power filter to generate sine cosine signals. Proposed EPLL system track amplitude plus phase angle of its input signal also maintain zero phase difference between input and output signal of voltage controlled oscillator and take out individual harmonic component. Improved power quality by proposed system has been tested in MATLAB/SIMULINK for non-linear loads.

Classification of EEG based Imagine Speech using Time Domain Features

Yogesh Paul, Ram Avtar and Sanjay Kajal

Abstract: Speech plays an important role in day to day life in communication. The patients suffering from severe motor neuron diseases are unable to speak due to restricted motor movement and find it difficult to communicate with others. brain computer interface (BCI) is the technology that can be used for the rehabilitation of such patients which can decode their thoughts into words/commands thus improving their quality of life. In present paper BCI has been implemented for the imagined speech, where three Hindi vowels were used that was pronounced by eight subjects covertly. Three statistical time domain features were used to classify Electroencephalographic (EEG) signals by applying linear support vector machine (SVM) as classifier. The results obtained were represented in terms of training accuracy (TA) and prediction accuracy (PA).

Low Bit rate Intra Prediction Coding for Medical Image Sequences using HEVC Standard

Ketki Pathak, Parth Vagela, Jay Desai and Anand Darji

Abstract: Rural health care center, storage and effective retrieval of medical images or volumetric medical videos is one of the important requirement for Telemedicine application. Most of the medical images or 3D images are in DICOM (Digital Imaging and Communications in Medicine) format. Early compression standard like JPEG2000 was inefficient and unsuitable for this kind of imagery. New HEVC (High Efficiency Video Coding) standard consist features like intra prediction, refined coding tool such as 35 prediction modes and ability to divide picture into Coding Unit (CU) to utilize all redundancies like Spatial, Temporal and Stastical. Dynamic Quad tree structure of HEVC provides substantial improvement in coding gain performance but adversely it also effect computational complexity. Here, we analyze the ability of HEVC standard to reduce the bit rate that represents medical image content with desired perceptual quality. In this paper, we proposed the dynamic degeneration of CU approach to obtain the improvement in visual quality of medical images with

limited bit rate. Quantitative analyses is done by varying the CU block size, which give drastic reduction in bit rate (61.25% on average) with very small change in PSNR (2.01% on average).

Crosstalk and Interference Analysis for Four Cluster MSB Optical Topology

Kajol Gundile and Bharat Chaudhari

Abstract: Optical Network on Chip (ONoC) is being researched for integrating no. of cores on a single chip or die. As there are some subsisting topologies of optical interconnect for ONoC, multi segment bus (MSB) is one them in which cluster of cores are interconnected in optical domain. Along the signal path of these topologies, signal losses and crosstalk component takes into account. MSB topology results in reduction of signal power and signal to noise ratio also decreases. This paper presents simulation and analysis of a 4 cluster topology. The design of multi segment bus is made by considering the losses due to various fundamental components used in the topology and uniformity of the components while placing them in the design. In design of photonic circuit, system requires micro ring resonators (MRRs) as modulators, and photodetectors with clear cognizance on the resonance behavior of the ring resonator. Inter segment routers (ISRs) couples light at a particular wavelength between two parallel waveguides. We have simulated the topology and results are presented.

Identifying Major Critical Factors Faced by Tourism Industry using Apriori Alogorithm

Prafulla Bafna and Anagha Vaidya

Abstract: Tourism is a major source of income for many countries, and affects the economy of both the source and host countries, in some cases being of vital importance. There are several challenges with respect to tourism industry stated in literature. In this paper we present a novel approach which facilitates groups of similar factors based on their degree of significance. This dissertation work comes up with the important challenges to be worked upon to get profit in the tourism industry which in-turn will increase the economies of the countries. It also selects the top N factors which are affecting tourism practices using a feature selection technique. Feature Selection (FS) is the fundamental process for identifying the features that play an important role in decision making process. Data mining techniques are widely used for data driven decision support. Feature selection is an important part of preprocessing that is carried out prior to data mining. FS algorithm or technique helps to reduce dimensions by removing unwanted or noisy data and also the data which is not having any influence on the outcome.

Curvelet Bound Type-2 Fuzzy Logic based Detection and Classification of Power Quality Events.

Rahul, Rajiv Kapoor and M M Tripathi

Abstract: Monitoring of power quality events is very crucial for better classification of the time-frequency varying power signals. This article deals with analysis of time-frequency characteristics of power quality events for accurate and efficient detection of disturbances using novel method of curvelet transform. In view of enhancing quality of power signals, this article proposes a novel scheme based on curvelet transform and type-2 fuzzy logic. The role of curvelet transform is to extract unique features of power quality events and type-2 fuzzy logic system function as a multi-classclassifier that can classify power quality events based on extracted features of curvelet transform. The purpose of this work is to present a new methodology for automatic localization, detection and classification of

numerous power quality events. A variety of disturbances such as voltage sag, swell, harmonics, transient and flickers are considered for experimental validation of proposed methodology. The testing of proposed method is done on synthetic as well as real power quality disturbances. The obtained results verifies that the proposed method can detect and classify variety of power quality events proficiently with less computation time in comparison with other methods such hidden Markov model(HMM), multilayer perceptron (MLP), type-1 fuzzy and probabilistic neural networks(PNN).

Implementation of Lagrangian Decomposition Model for Unit Commitment Problem using Wind Generating Units

S Maheswari and R Santhoshkumar

Abstract: The aim of this paper is to find the minimum generation cost for the power generating units. That is the maximum power utility period over the planning time period. S.Maheswari et al.(2010,2011and 2012) have discussed the unit commitment problem for hydro-thermal units. Lagrangian optimization model is formulated for UCP using Wind generating units. It optimizes the production cost for generation of units. Schedule the generation units in order to serve the load (demand) at the minimum operating cost while meeting all plant and system constraints. Generation scheduling gives the maximum load utility period over the time interval. The optimum value of the model is analyzed; it reveals the fact that Maximum profit can be achieved for power generating utility in order to supply the load in a reliable manner

Equalizer Enhances Broadband Characteristics of Vector Modulator based Linearizer

Bhumi Bhatt and Subhash Chandra Bera

Abstract: This letter presents Vector Modulator based Linearizer to obtain 1GHz of bandwidth using the resistor based equalizer. The vector modulator based Linearizer circuit generates various combinations of amplitude and phase characteristic by changing the values of terminating resistors. The equalizer circuit is capable to generate zero, positive as well as negative slope as a function of operating frequency without change of insertion loss by adjusting the value of the resistor. Here the simulation work for the 1GHz bandwidth of Linearizer over 4GHz and 5GHz frequency at 5dB gain expansion and 45 degree phase change is presented.

Surface Characterisation of Nano Image using Matlab

Hemanth Kumar M S, Nuthan A.C and Sumitha C

Abstract: There has been a plenty of research done on the characterization of surface in macroscopic level. The surface characterization of materials at Nano scale using image processing techniques find plenty applications in computer vision and image processing technologies. This is a novel area of research and only little number of researches exists in terms of literature for the analysis of Nano scale materials. A few attempts have been done in Nano scale images.

Design and Architecture of Wireless Body Area Network using Android Application

Kumar Keshamoni

Abstract: Patients in hospitals have issue with health instrumentality that's connected with wires to their body. Wired health instrumentality restricts the quality of the patient. Moreover, health

caretaker's area unit compelled to work the instrumentality and take the measurements. Hence, wireless observance of patient is incredibly effective resolution thereto drawback. The most target of this study was to analysis the present trend and prospect of wireless observance of patients within the hospitals. This study conjointly aims to create the epitome system to implement wireless observance. Additionally to that, this thesis conjointly studies most fitted technique for building the foremost effective wireless observance system. The sensing element nodes and receiver of the epitome were designed. Golem phone was used as entranceway to receive the information from sensing element node and forward the information into receiver. Bluetooth Low energy was wont to communicate between sensing element nodes and golem phone. LAN is employed to speak between golem phone and also the receiver that is connected to laptop. The sensing element readings were initially ascertained in Arduino Serial Monitor so sent to sink node. The sensing element readings of a body were displayed in golem phone and yet as within the web site. Real time information of sensing element was created and with success updated within the web site. The study of results and project showed that wireless observance would be terribly effective by exploitation Interference free, short vary and extremely secure suggests that of communication. Bluetooth low energy that is appropriate choice for the system. Style of sensing element nodes ought to be terribly tiny as a result of it's to be worn round the body. Therefore smaller parts ought to be used.

Design and Installation of Grid Connected Roof Top Solar PV System

Satya Mishra

Abstract: Now a days the world is thinking about energy which will be vanished one day ,that is non renewable energies. So the only solution is to replace these non renewable energies by renewable energies like wind energy, geo thermal energy, bio gas energy and solar energy. Today we all moving to clean and Green energy and solar energy is the most utilizable energy in the world. Solar PV is of two types. one is the heat energy called solar thermal other is the light energy called Solar PV system which can be classified as mainly three types as Grid connected Solar PV system, Off Grid Solar PV system and hybrid Solar PV system. In this paper I have worked and installed a 10 Kwp roof top solar Grid connected system which is synchronized with 3 phase, 50 Hz, 750 KVA Transformer.

A Study on the Impact of SHGs on their Development of their Attitudes and Skills of Women in Krishnagiri District.

Dr. Beulah Suresh and Arivuselvey Jayaraman

Abstract: The words of Shri. Jawaharlal Nehru, Former Prime Minister of India, highlights the role of women as, "You can tell the conditions of a Nation by looking the status of women". Hence, the status and conditions of women are considered as the gauge of the country, and it is essential to uplift the society. This paper aims in analyzing the post effects of women joining Self Help Group (SHG), with respect to the income generating measures, attitudinal changes of women and the family. It also intends to evaluate their enhancement of skills and self development. The data were collected from 400 SHG women in Krishnagiri District and were analysed using SPSS. The output of the research portrays that SHG women and their progress is in assenting terms in Krishnagiri District, Tamil Nadu, India.

A Study on the role of Integrated Village Development Project (IVDP), Krishnagiri in Empowering the Women of SHG in their Social and Personal Life.

Dr. Beulah Suresh and Arivuselvey Jayaraman

Abstract: Non Governmental Organizations plays a vital role at certain times in strengthening the community, society, in turn, the overall state. The Self Help Groups (SHG) being assisted by such kind of NGO named IVDP – Integrated Development Project has been focused for this research with the intention to study the role of IVDP in empowering women. In general, women take part in SHG activities and play a imperative role to lift the economic status of the family, community, society. Hence, this paper aspires to analyze the personal attitudes of the Self Help Group women towards social evils and to study the post effects of joining SHG with respect to their changes in social and personal life. The data were collected from 400 SHG women associated with Integrated Village Development Project (IVDP), an NGO located in Krishnagiri District, Tamil Nadu. The data collected were analyzed using SPSS. This study yields the fact that the life of SHG women are in affirmative conditions in terms of their enhanced status, decision making on various issues.

Enhanced Asymmetrical PWM AC Chopper Fed Capacitor Run Induction Motor Drive using Bacterial Foraging Optimization Algorithm

Murali N and Balaji V

Abstract: Capacitor run induction motor drive is employed for efficient speed control in industrial applications. The phase control method has inherent drawback of poor power quality compared to multiple pulse width modulation techniques. This paper presents performance improvement of AC chopper fed capacitor run induction motor with symmetrical pulse width modulation and enhanced asymmetrical pulse width modulation. The enhanced asymmetric pulse width modulation technique is assimilated by four pulses in a quarter cycle using bacteria foraging optimization algorithm. The performance parameters are total harmonic distortion, input power factor and efficiency. Simulation results shows that proposed technique is better compared to conventional technique.

Review on Mobile Ad-hoc Network in Lightweight Cryptographic Environment

Raghvendra Patel, R.K. Pateriya and Sonika Shrivastava

Abstract: Mostly symmetric key encryption algorithms are used to provide security of MANET, various security goals like confidentiality, integrity, non-repudiation, authentication, and availability get satisfied but these algorithm are inefficient . There is an immense need to minimize the energy consumption during its MANET operation While providing the required level of security in the wireless communication environment. Recently, there has been lots of work going on to develop energy efficient and low-cost security methods in wireless networks like network coding is one of the technique that can be used in MANET to reduce energy consumption while maintaining its scalability, transparency, security and performance. This paper provides a review on multipath routing protocol and lightweight protocol applied in MANET and discuss various congestion control and energy saving techniques used here. Security is also an important issue in MANET so this paper highlight various types of vulnerability and attacks possible on this network. The main motive of the paper is to discuss

how Lightweight protocol helps in reducing the energy consumption while maintaining security in MANET.

Smart Energy Meter Monitoring System using IoT [Internet Of Things]

Prof. Parag Datar, Prof. Vani Datar, Sourabh Kulkarni and Rahul Gore

Abstract: We can see a person standing in front of our house from electricity board, whose duty is to read the energy meter and handover the bills to the owner of that house every month. This is nothing but meter reading. According to that reading we have to pay the bills. The main drawback of this system is that person has to go area by area and he has to read the meter of every house and handover the bills. Many times errors like extra bill amount or notification from electric board even though the bills are paid are common errors. To overcome this drawback we have come up with an idea which will eliminate the third party between the consumer and service provider, even the errors will be overcome.

In this project the idea of smart energy meter using IoT and Arduino have been introduced. In this method we are using Arduino because it is energy efficient i.e. it consume less power, it is fastest and has two UARTS. In this project, energy-meters which is already installed at our houses are not replaced, but a small modification on the already installed meters can change the existing meters into smart meters. The use of Wifi module provides a feature of viewing the bill and consumed units. One can easily access the meter working through web page that is designed. Current reading with cost can be seen on web page. Automatic ON & OFF of meter is possible.

Filtering Techniques for Denoising Image

P Jayapriya and Manimegalai R

Abstract: In image processing applications, image enhancement plays vital role in improving the quality of the image, after acquiring it. The environment and humidity are the two major issues in acquiring and capturing the images. The data acquired from the sensors are affected due to environment and humidity. There will be intensity variations in pixel due to illumination or poor quality of images. Therefore, the images captured through sensors or cameras cannot be used directly for image processing and should be processed before it is used. Filtering can be used as a pre-processing technique which can modify and enhance the acquired image. Filtering is used either to crush the high frequencies or low frequencies of the image. The high frequencies smoothen the image and the low frequencies enhance and detect edges in an image. Filtering is applied in frequency domain or spatial domain. The quality of biometric trait should be improved for extracting the key features. This paper discusses about various filtering techniques and how they are used to remove noise, smoothing, sharpening and edge detection of images.

Obstacle Avoidance for Autonomous Mobile Robot using Hybrid Artificial Immune System

Prases K. Mohanty, A.A Kodapurath, Rishi Kumar Singh, Rohit Kumar Singh, Dibyajyoti Saikia and Shubhasri Kundu

Abstract: Obstacle avoidance is a very important aspect of autonomous mobile robotics. There are many algorithms for obstacle avoidance of which some takes inspiration from nature. Artificial Immune System (AIS) is one such algorithm based on the biological immune system. In this paper

both the biological and mathematical aspects of the immune system are investigated along with the mapping of these aspects for mobile robot navigation. In the current work, a hybridized variant of AIS is introduced for robot navigation. The Clonal selection theory and Idiotypic network theory are combined in order to switch effectively and efficiently between the two modes (i.e. Clonal and Idiotypic) to obtain a collision free path in a partially known environment. Simulation results proved that our mechanism is capable of successfully avoiding different types of obstacles including the local minima situations.

Hybrid SET-CMOS based Implementation of Three-Point Median Filter for Image Processing Applications

Arpita Ghosh and Subir Kumar Sarkar

Abstract: The paper presents the implementation of a three-point Median filter with Single-electron-transistor and Metal-Oxide-Semiconductor-Field-Effect-Transistor based hybrid technology. The Median filters are often used in image processing applications for removing the impulse noise of an image. This non-linear filter is utilized in different commercial and medical image processing applications. The median filter implementation with the SET-CMOS hybrid technology can make the filter more compact and less power consuming.

Gesture Recognition Techniques: A Comparison on the Accuracy & Complexities

Ajay Kumar, Anil Khatak and Anju Gupta

Abstract: Most active field of research in image processing & ICT is Hand gesture recognition & detection system. The principal aim of the research in this field is to create an interface between sign language recognition and Human-Computer Interaction (HCI). This article investigates and develops the significance of the various gesture recognition techniques by extensively surveying the latest proposed techniques from the reputed journals. A comparison is developed considering the accuracy of the gesture recognition system, the complexity of the system & various diverse applications in which these techniques can be employed. The complexity of a system is judged by the number of stages involved along with the way the comparison is made from the database.

Design of Channel Encoder with Security

Ravi Kumar and Padmaraju Koppereddy

Abstract: Error control and security are prominent functions in digital communication systems. Reliability, security and efficient in digital data transmission systems having more demand in high speed communication networks. The Error protect against free knowledge transmission to the variable channel conditions channel secret writing schemes area unit used. In this paper trellis pruning and puncturing as new cryptography ideas, we offer security to the channel encoders supported turbo codes and to attain responsibility similarly. Puncturing is used to decrease the performance of the code and so increase the error likelihood tough by an listener at a given SNR. The cryptographic attacks can become not possible As a result of Puncturing thanks to whose quality depends on the error likelihood. The trellis pruning, is alter the legitimate users communicate faithfully in a verysecret fashion. The legitimate users has superior performance, in terms of bit error rate than the snooper, that depends on puncturing and pruning rates. During this paper associate rule is planned to calculate the puncturing and pruning rates supported EXIT charts. The trellis pruning, is alter the legitimate users communicate

dependably during a} very secret fashion. The legitimate users has superior performance, in terms of bit error rate than the snoop, that depends on puncturing and pruning rates. Throughout this paper associate rule is planned to calculate the puncturing and pruning rates supported EXIT charts. For providing security to the channel encoder that may lead to less complex systems [20] and improve processing latency. Error control and security are prominent functions in digital communication systems. Reliability, security and efficient digital data.

Capacity Enhancement for Coded-Beams High Throughput Satellite Systems

Eman Salah, Dr. Joseph V. M. Halim and Prof. Dr. Hadia M. El-Hennawy

Abstract: This paper investigates the capacity enhancement derived from the new trend of Coded-Beam High Throughput Satellite (CB-HTS) System; CB-HTS is a methodology of adoption of Direct-Sequence Code Division Multiplexing (DS-SS) orthogonal coding as a resource allocation associated with each beam of multi-beam satellites. This system offers no spectrum reuses and there is no co-channel interference between beams as they are isolated with the code orthogonally, therefore the system throughput increases without scarifying any resources or increasing neither system complexity nor latency. The presented work uses the affordable polarization resource at the user terminal side to increase the capacity in each beam by using both vertical and horizontal polarization support with the conventional multiple accessing techniques between users in the beam. Results shows the superiority of proposed scheme compared to current state of- the art in cases of practical interest.

A Study on Mutual Coupling Coefficient Reduction between Four Port MIMO Microstrip Antenna

Shiddanagouda F B Byanigoudra, Dr.Vani R.M and Dr.P.V Hunagund

Abstract: This paper compares the performance of four port Multiple Input Multiple Output (MIMO) microstrip antenna using Defected Ground Structures. The conventional four port MIMO microstrip antenna is resonating at 5.9 GHz and producing bandwidth and mutual coupling coefficient equal to 223.1MHz and -20.9dB. The proposed MIMO microstrip antenna is operated dual resonant frequencies 2.5GHz and 5.1GHz respectively. The proposed MIMO antenna first resonating frequency producing bandwidth and mutual coupling coefficient are equal to 75.9MHz and -29.7dB, and second resonating frequency producing bandwidth and mutual coupling coefficient are equal to 277MHz and -18.90dB. The proposed MIMO microstrip antenna is better than conventional MIMO antenna interns of bandwidth, data rate and mutual coupling coefficient. The MIMO antenna are designed using ANSYS HFSS software. Details of the antenna design and results are presented and discussed.

PDE-Based Filter Adapted to Poisson Noise for Restoration and Enhancement of Computed Tomography Images

Nikhil Singh and Rb Yadav

Abstract: In Poisson noise, the number of collected photons is so small due to the low light environment that results in the degradation of the image by reducing image resolution and contrast. Therefore, Poisson noise evaluation is necessary for the restoration of digital images. In this paper, a filter which is based on the partial differential equation (PDE) is introduced for the restoration of noisy images. The proposed PDE based filter describes as Poisson noise adapted anisotropic diffusion based method in the L-2 framework. Regularization function and data fidelity are two components of this

filter. During the filtering process to maintain a proper balance between the data fidelity term and the regularization function, a regularization parameter λ is introduced. Evaluation of performance parameters for all the described techniques is done with the help of MSE and PSNR.

Development of Electrical Energy Generation based Uninterrupted Operation for Grid Integration of Utility using RES

Vilas Bugade and Dr. Pradeep Katti

Abstract: The post-parthenon in electrical power system is prominence on demand side management for grid integration with renewable energy sources (RES's) in the form of distributed generation (DG). At a fleeting look system up gradation predominantly focuses on grid integration of multiple energy sources. This paper presents the design and development topology for multiple sources of energy like solar PV, wind energy etc. for three phase grid integration. It is in consideration with an optimal power flow analysis of these sources. The real time monitoring, controlling and protection is provided through digital signal processor (DSP) and switch gear. All the power system parameters (voltage, current, temperature etc.) are displayed on display unit through parallel port controller area network bus (CANBUS). These parameters are vital for synchronizing of voltage, frequency and waveform at point of common coupling (PCC) at the time of grid integration with RES. Also these are expedient for the switching of protective devices. For remotely monitoring and control an Ethernet port are implemented with the provision of GSM in it. Finally with these features testing is conceded for linear and dynamic loading.

Enhanced Asymmetrical PWM AC chopper fed capacitor run induction motor drive using Bacterial Foraging Optimization Algorithm

Murali N and Balaji V

Abstract: Capacitor run induction motor drive is employed for efficient speed control in industrial applications. The phase control method has inherent drawback of poor power quality compared to multiple pulse width modulation techniques. This paper presents performance improvement of AC chopper fed capacitor run induction motor with symmetrical pulse width modulation and enhanced asymmetrical pulse width modulation. The enhanced asymmetric pulse width modulation technique is assimilated by four pulses in a quarter cycle using bacteria foraging optimization algorithm. The performance parameters are total harmonic distortion, input power factor and efficiency. Simulation results shows that proposed technique is better compared to conventional technique.

Low Power PVT Robust Area Efficient Pulse Triggered Flip-Flop Design

Indira Ponugumatla and Maddu Kamaraju

Abstract: The sequential digital circuits, like Flip-Flops (FFs), are the key elements of VLSI integrated circuits design such as microprocessors, microcontrollers, and high complexity chips. The FFs design affected by the factors is low power, transistor count, clock load, design robustness, and power-delay tradeoffs. In this paper, we propose a low power area efficient pulse triggered FF (LPDEFF) using optimal clock gating and tri-state inverter logic. First, we present a new physics model for MOSFET for improving the process-voltage-temperature (PVT) aware design. The optimal clock gating is achieved by the modified particle swarm optimization (MPSO) algorithm, which optimizes FF in

terms of charge sharing and leakage, short circuit power dissipation. Then, we introduce an alternative design approach i.e. tri-state inverter for reduce the transistor count and improved power delay product (PDP). The proposed LPDEFF design was implemented in the HSPICE tool with different CMOS bulk process. Simulation result shows that proposed LPDEFF design perform efficient than conventional FFs in terms of number of transistors used, delay, power consumption, and PDP.

Noble Approach to Develop Smart Wheel Chair for Handicapped People

Fatin Hasnath Chowdhury, Hasan Uz Zaman, A S M Muktadiru Baized Shuvo, Al Amin Hossain, S M Hasibul Hoq, Nusrat Jahan Tamanna, Tasfiqul Ghani, Nazia Nawar Hassan, Mohammed Jawad Ibne Ishaque, Rashik Ishrak Nahian and Sifat Rezwana Tamim

Abstract: this paper introduces a wheelchair that is based on user-friendly smart technology. The wheelchair is controlled via smartphone android app. Joystick option is also available in case of user demand. Performance analysis is shown to evaluate how the wheelchair is unique. The efficiency of the entire system is established through practical studies. The end result denotes the practicality, affordability and reliability of the smart wheelchair. This paper also enables the immense possible research scope for handicapped people.

Tamil Handwritten Character Optical Recognition

Manimegalai R, Adarsh S, Praneshwar C, Kathiresan A, Gokul Ram Mt and Naveen Kosgi

Abstract: Optical Character Recognition is the technique of recognizing printed or handwritten text. An Optical Character Recognition System (OCR) system for a language like Tamil may provide a solution to data entry problems in various domains which involves digitization of manuscripts and printed documents. Lots of research work has been done in the recognition of printed documents especially for English and other European languages. To the best of our knowledge, little work has been done for handwriting recognition of Indian languages. The main goal of this work is to develop a desktop application that helps to recognize handwritten Tamil characters. The input data to the system is the handwritten text that needs to be digitized and processed. Gray or colour image of the text to be digitized is fed to the system. The text recognition system then performs several recognition techniques to identify each and every handwritten Tamil character in the input image. After the recognition is done, an output text file is generated which has the contents of the handwritten text. This digital file now can be used for various purposes, including data entry and classification.

Impact of Wind Power Integration on Transient Stability of Power System

Gauri Deshmukh and S.R Deore

Abstract: In view of the fact that conventional sources of energy are depleting, non conventional sources are being introduced in the power system. Their contribution to the load sharing is still not much in comparison to the conventional sources. This is because few challenges are faced by system designers while integrating these sources to the grid. Conventional sources of energy such as thermal hydro and nuclear have the advantages over economy, controllability and flexibility of output. Non conventional sources lack in the above said advantages, but are infinitely available and environment friendly. As a result many countries are making government policies insisting to enhance more in renewable generation capacity. As renewable sources lack in controllability and flexibility, it gives

rise to many grid interconnection challenges. Introduction to renewable sources and its integration to grid is decided based on its impact on system stability. In this paper, the minimum capacity of synchronous generation needed to maintain transient stability of the system even after integration of wind is calculated. Study is proposed for a standard IEEE 14 bus test system under a particular loading and fault condition, the minimum synchronous generation needed to maintain system stability is found. Also the optimum location at which wind energy should be integrated for better system performance is discussed. All the results are discussed in detail. MATLAB simulations are performed and results are interpreted.

Evolution of Proportional Integral Derivative Controller

Omar Hanif and Vatsal Kedia

Abstract: Proportional Integral Derivative order controller has been used in feedback mechanism since time immemorial. The paper introduces a novel form of proportional integral derivative (PID) controller termed as complex fractional order proportional integral derivative (CFOPID) controller of the form $PI^{(x+iy)} D^{(a+ib)}$. This variant of PID controller has more number of parameters than any of the PID and its derivatives. This work realizes a complex natured PID controller and exhibits the tuning of all the variants of PID controller utilizing Genetic Algorithm (starting from primitive Proportional controller to advanced CFOPID controller). It additionally relates the responses of each of the controllers and concludes the superior variant of PID controller.

Design of Dual Band T-Shaped Dielectric Resonator Antenna (DRA) for Radar Application

M. Chandra Kiran, K. Phani Priyanka and K. Rama Devi

Abstract: In this paper, single port linearly polarized T-shaped dielectric resonator antenna (DRA) is operated at C-band (4-8) GHz and X-band (8-12) GHz of radio communications. A T-shaped DR having relative permittivity $\epsilon_r=9.8$ is placed on the top of a substrate associated with truncated ground plane. The DRA is excited by single port micro strip feeding mechanism. The resonating frequencies have occurred at 4.2GHz (3.84.6) GHz and 9.3GHz (8.8-9.8) GHz. The radiation efficiency of DRA is observed up to 10 GHz. A peak gain of 4.90 dBi and 6.01 dBi are achieved at 4.2 GHz and 9.3 GHz respectively. The proposed antenna is preferably useful for radar applications and also for satellite applications.

Development of Embedded Stethoscope for Heart Sound with Noise Reduction Feature using ZIGBEE Module

Gunasekhar P and Dr. Vijayalakshmi S

Abstract: The main idea of the proposed work is “the construction of wireless stethoscope with noise reduction feature”. The stethoscope serves as the most frequently employed tool in the primary health care. Sometimes hearing the patient’s heart sound or murmurs which are low in amplitude may lead to false diagnoses and this project helps to overcome these problems. The objective of this project is that the physician will be able to monitor his patient’s condition by the graph displayed in his laptop with the aid of the ZigBee module. MATLAB software is used for analyzing the heart sounds, so the doctor will be able to diagnoses the graph accurately. ZigBee module is employed for wireless transmission of data from the stethoscope to the doctors who are far away from the patients while the stethoscope is in contact with the patients. When immediate assistance is required i.e. when the readings cross the

threshold level, a buzzer would alert the authorities for the immediate assistance. All the components could be built and controlled through the Arduino microcontroller which is easy and simple to implement. Thus, the project aims at helping people and as well as doctors for easy and accurate diagnoses through the extensive use of embedded systems and wireless communication technology.

A Variational Approach to Reconstructing Mammogram Images Corrupted by Poisson Noise

Sneha Tiruwa, Rb Yadav and Ayushi Verma

Abstract: Here in this manuscript, we introduce a Total variation to eradicate noise from an image which has been corrupted by Poisson's noise. To described in and our introduced method uses methods to regulate the total variation in order to preserve edges. Apart from this it also uses a data fidelity term preferable for Poisson noise. A variety of techniques have been presented on de-noising Mammogram images and each technique has its own assumptions, advantages and limitations and also compares the performance of the filters based on the parameters like Mean square Error Peak Signal to Noise Ratio. Like Poisson's noise, the result of this regularization is also signalling dependent. The design steps include preprocessing. The pre-processing steps include manual cropping of original mammograms for removal back- ground details, quantum noise reduction, and contrast enhancements. For quantum noise reduction, a modified TV based filter adapted to Poisson noise is used.

An Interpretation on Type-I & Type-II Compensators for PWM Controlled SBC in VRM Applications

Vaman B Gudi and Paramesh A

Abstract: In the present situation the consumer electronics market requests the reliable, high effective electronic devices with least size at exceptionally sensible cost. Normally the power supply unit assumes an imperative part in choosing the above said factors. The principle goal of the work is to outline the design, simulate and compare the performance of two different type's compensators for PWM controller used in unique VRM designs which provides fast transient response, high frequency, better efficiency, good regulation, low supply voltage and a small area requirement on the motherboard. The schematics of the proposed typed have been simulated using cadence virtuoso environment. The performance results briefs the merits of the proposed types of controllers comparing to the existing controller circuits for VRM application.

Copy –Move Forgery Detection – A novel Approach

Jigna Patel and Ninad Bhatt

Abstract: Copy and Paste forgeries are a very common and simplest type of image alterations that are most widely launched technique to forge an image. In copy move forgery a part of an image is copied, geometrically changed and pasted on different various sites of the same image with intention of concealing some of the vital information. Due to advances in image processing software, it is easier to manipulate images without leaving visually noticeable traces. This paper presents the review of copy-move forgery detection and suggests an approach where we can find geometrically transformed copy pasted regions in the image.

Simulation of Sinkhole Attack on RPL Routing protocol

Ashwini Dalvi

Abstract: Internet of things is emerging rapidly in industries. IoT can consists of millions of devices which depends on low power and light weight protocols in lossy network. RPL is ipv6 based lightweight protocol used for IOT devices. With increasing popularity of RPL based IOT devices we should consider risks and attacks related to RPL protocol. In this paper we will show the simulated analysis of sinkhole attack on RPL.

Samiksha: Low Cost Field Monitoring System

Siddharth Srivastava, Akanksha Garg, Richa Verma and T.V. Prabhakar

Abstract: Samiksha is cost-effective, easy to use field monitoring system. It is developed for poor Indian farmers. It takes advantage of gondola based balloon system in order to do the survey. It is equipped with small cannon which fires plastic dots on animals who are trying to enter the field. It enables the user to monitor area under consideration using a camera attached to it. The system can be controlled remotely using simple smart-phone in one out of three modes namely manual, semi-automatic and extended-automatic. Development cost is less than \$25, which is further going to be reduced by fifty percent in next version of the project when we will go for mass production. In this paper we will focus on Samiksha-1 which is first prototype. We will compare its performance with existing cheapest drone present in India with respect to cost and service time.

Physics of Open System. Non-standard Approaches in the Context of Studies of Multidimensional Coupled Chaotic Systems of Fractional Order

Eduard Vladimírsky and Bahram Ismailov

Abstract: Purpose of the work to consider non-traditional approaches in the context of analysis of transients in extensive and non-extensive multidimensional coupled heterogeneous chaotic systems of fractional order. In the aspect of thermodynamic-information, a mathematical model of transient processes, an algorithm for controlling coherent behavior, and results of modeling coupled systems are presented.

Wearable Health Monitoring System using Arduino GEMMA

Vinay Bandekolla and Jyothi Bathula

Abstract: Worlds ageing population and predominance of obstinate diseases have led to a high demand of ambulatory healthcare system, which can monitor vital-signs. Our aim is to develop a generic clothing technology which successfully integrates biosensors woven into a shirt. We have therefore developed an ambulatory device which enables the measurement of heart rate, electro dermal activity, and skin temperature with non-invasive sensors. Since we are combining parameters such as body temperature and galvanic skin resistance, we get to know about the patient's integral condition. One of the key features of our system is fall detection, which mainly arises from the complication of heart attack during which body's vitals-sign changes and patient tends to collapse. This system gives warning to prevent such complications. Our research is mainly orientated towards two complementary

directions Improving the relevancy of each sensor and increasing the number of sensors for having a more synthetic and robust information.

A Noble Approach to Develop Smart Travel Bag

Zunayeed Bin Zahir, Fatin Hasnath Chowdhury, Nazia Nawar Hassan, Shabbir Ahmed, Sifat Ayat Jahan, Abu Al Mahadi and Nusrat Jahan Tamanna

Abstract: The paper introduces a mobile, voice controlled and gesture controlled based technology that is useful for daily life usage and for travelling. The smart travel bag is able to carry weight and move automatically without anyone's hand support. The system is consist of robotics and sensors programmed in microcontroller. The smart bag will be able to move by given instructions of its user. At the same time the bag ensures safety and will give reminder if it's overweight. After practical experience and user's feedback the system is established. The overall performance analysis result shows the feasibility, reliability, affordability and uniqueness of the system. The system is a must need technology for travelers and everyone who carry multiple bags at any place at certain time. It will save both time and energy. This paper shows more possible research scopes as a daily life tool for human.

Interface for Physically Disabled

Mamta D'Britto, Abhijit Joshi and Narendra Shekokar

Abstract: The current computer interface set up of a mouse and keyboard requires the user to have full use of his or her hands. Unfortunately, many people are not in a position to use their hands due to injury or illness and are thus unable to use a computer using traditional hardware setup. There have been many alternative assisting technologies that assist such disabled people. But they still lack in some functionalities. This paper presents an approach and shows how speech recognition can help such people to accomplish their tasks with PCs

Lecture Notes in Networks and Systems 107

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Innovations in Electronics and Communication Engineering

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Orchestrator Controlled Navigation of Mobile Robots in a Static Environment	193
Rameez Raja Chowdhary, Manju K. Chattopadhyay and Raj Kamal	
Multi-band Hybrid Aperture-Cylindrical Dielectric Resonator Antenna for Wireless Applications	207
Chandravilash Rai, Amit Singh, Sanjai Singh and Ashutosh Kumar Singh	
An Enhanced Dynamic Cluster Head Selection Approach to Reduce Energy Consumption in WSN	215
C. Sudha, D. Suresh and A. Nagesh	
Security Enhancement by Preventing Wormhole Attack in MANET	225
Anjali B. Aswale and Radhika D. Joshi	
UWB Antenna with Artificial Magnetic Conductor (AMC) for 5G Applications	239
S. Kassim, Hasliza A. Rahim, Mohamedfareq Abdulmalek, R. B. Ahmad, M. H. Jamaluddin, M. Jusoh, D. A. Mohsin, N. Z. Yahya, F. H. Wee, I. Adam and K. N. A. Rani	
Flexible UWB Compact Circular Split-Ring Slotted Wearable Textile Antenna for Off-Body Millimetre-Wave 5G Mobile Communication	251
H. W. Lee, Hasliza A. Rahim, Mohamedfareq Abdulmalek, R. B. Ahmad, M. H. Jamaluddin, M. Jusoh, D. A. Mohsin, F. H. Wee, I. Adam, N. Z. Yahya and K. N. A. Rani	
 achievable Throughput of Energy Detection Spectrum Sensing Cognitive Radio Networks	261
Anitha Bujunuru and Srinivasulu Tadisetty	
A Review on UWB Metamaterial Antenna	271
Ambavaram Pratap Reddy and Pachiyaannan Muthusamy	
Investigating Combinational Dispersion Compensation Schemes Using DCF and FBG at Data Rate of 10 and 20 Gbps	279
Md. Asraful Sekh, Mijanur Rahim and Abdul Touhid Bar	
Embedded Systems	
A Low-Power FinFET-Based Miller Op-Amp Design with g_m Enhancement and Phase Compensation	291
Mohammed Kursheed, C. H. Kiran Kumar and Ravindrakumar Selvaraj	

Orchestrator Controlled Navigation of Mobile Robots in a Static Environment	193
Rameez Raja Chowdhary, Manju K. Chattopadhyay and Raj Kamal	
Multi-band Hybrid Aperture-Cylindrical Dielectric Resonator Antenna for Wireless Applications	207
Chandravilash Rai, Amit Singh, Sanjai Singh and Ashutosh Kumar Singh	
An Enhanced Dynamic Cluster Head Selection Approach to Reduce Energy Consumption in WSN	215
C. Sudha, D. Suresh and A. Nagesh	
Security Enhancement by Preventing Wormhole Attack in MANET	225
Anjali B. Aswale and Radhika D. Joshi	
UWB Antenna with Artificial Magnetic Conductor (AMC) for 5G Applications	239
S. Kassim, Hasliza A. Rahim, Mohamedfareq Abdulmalek, R. B. Ahmad, M. H. Jamaluddin, M. Jusoh, D. A. Mohsin, N. Z. Yahya, F. H. Wee, I. Adam and K. N. A. Rani	
Flexible UWB Compact Circular Split-Ring Slotted Wearable Textile Antenna for Off-Body Millimetre-Wave 5G Mobile Communication	251
H. W. Lee, Hasliza A. Rahim, Mohamedfareq Abdulmalek, R. B. Ahmad, M. H. Jamaluddin, M. Jusoh, D. A. Mohsin, F. H. Wee, I. Adam, N. Z. Yahya and K. N. A. Rani	
Achievable Throughput of Energy Detection Spectrum Sensing Cognitive Radio Networks	261
Anitha Bujunuru and Srinivasulu Tadisetty	
A Review on UWB Metamaterial Antenna	271
Ambavaram Pratap Reddy and Pachiyaannan Muthusamy	
Investigating Combinational Dispersion Compensation Schemes Using DCF and FBG at Data Rate of 10 and 20 Gbps	279
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Mohammed Kursheed, C. H. Kiran Kumar and Ravindrakumar Selvaraj	

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Achievable Throughput of Energy Detection Spectrum Sensing Cognitive Radio Networks

Anitha Bujunuru and Srinivasulu Tadisetty

Abstract Upgrading usages of wireless communication applications have many constraints on the utilization of accessible wireless spectrum. Cognitive radio (CR) technology is an emanating and auspicious solution to the issue of insufficient licensed spectrum. The spectrum sensing is the majority demanding issue in cognitive radio applications to find out the accessible spectrum bands which can be utilized by secondary user without providing any unfavorable intervention to the primary user. SU will sense the existence of PU and utilizes the spectrum for data transmission if the spectrum is free without providing any harmful interference to the PU. To achieve this, SU must require an adequate amount of sensing time, which in turn reduces the transmission slot. Thus, the total average throughput of the SU must reduce with increase in sensing time. The performance of simple energy detection (ED) spectrum sensing is analyzed in terms of total error probability and receiver operator characteristics. Simulation results of variation of throughput with SNR and effect of increasing sensing time on throughput are presented using MATLAB under AWGN channel.

Keywords Cognitive radio · Spectrum sensing · SNR · Sensing time · Throughput

1 Introduction

The radio spectrum available is limited, and wide increase in usage of wireless communication rises to the issue of spectrum scarcity. Most of the pre-allocated radio spectrum is underutilized by the primary user which creates holes are also called spectrum holes. Spectrum holes are the unutilized chunk of spectrum by the licensed user at the given specific time. Therefore, most of the pre-allocated radio spectrum is underutilized due to the uninspired approach of spectrum management schemes (fixed spectrum assignment schemes) and can be solved using cognitive

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and Communication Engineering.



Medical Image Security Based on Enhanced 1D Chaotic Map



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Abstract

Medical images are playing for an importance diagnosis of many diseases. However, the securities of medical images are inferior. Therefore, the importance of security of medical images is paramount to avoid mishandling moreover; the conventional cryptographic algorithms are unable to provide robust security. Hence, an innovative algorithm has been developed to provide robust security to medical images to avoid mishandling. In this paper introduces a new method for medical image of making a simple and more effective chaotic system by using two differences of the output sequence of same existing one-dimension (1D) chaotic maps. The medical images simulation and security evaluations show that the proposed system is able to produce a one-dimension (1D) chaotic system, which is better chaotic performance and wide chaotic ranges compared with the previous chaotic maps. To the investigate its applications in medical images security encryption, a novel encryption system of linear-nonlinear-linear structure based on total shuffling method is proposed. The experiment was demonstrated the accuracy of the medical image's encryption algorithm. The experiments and security analysis prove that the algorithm has an excellent performance in medical images encryption and various brute force attacks. As medical images contain noise, we should apply median filter as preprocessing step. And to get improved results we applied histogram equalization for encrypted image to get final encrypted image which is more robust than normal encryption.

Keywords: Medical images encryption; Chaotic algorithm; Histogram; PSNR; Image

Introduction

Traditionally, the pelvic treatment fields for gynaecological can Nowadays information security is a vital key problem in information communication technology. With the advancements of information technology, plenty of digital contents are being stored and transmitted in various forms. As a result, the protection of digital contents data against non-uniform phenomena, such as illegal copying, and guarantee of their secure utility has become an important issue. Compared to text data, some intrinsic features of image data, such as big size, high diffusion of data and strong correlation among adjacent pixels are different with expected information. Furthermore, image data requires the strong real-time property in communication, therefore, an encryption method with fast speed and high security is needed. But the traditional algorithms block encryption being extensively used now is found to be inefficient for real-time communication system [1]. Therefore, too many image encryption methods using chaotic maps with more sensitivity to their initial conditions and system parameter values and simple structures are proposed. There are many algorithms used in image security encryption, such as fractional wavelet transform [2,3], p-Fibonacci transform [4], gray code [5], vector quantization [6] and chaos [10-29], have

been proposed and among them the image security encryption based on the chaotic map is being more widely used. In some of the researches have been used, S-box using the chaotic sequence is in encryption and decryption system [30-32].

This encryption system can be divided into two parts:

- i. One part is generating the security key.
- ii. Other part is encryption by using the key.

In the chaotic maps used in creating the security key can be divided into two categories: one is one-dimension (1D) and other one is multi-dimension (MD). At present, the MD chaotic maps are being more widely applied to image security encryption systems. But, owing to their composite structures and multiple parameters, the difficulty of their hardware/software implementations and the estimation complexity were increased. Here, the contrary, 1D chaotic map has an advantage that their structures are simple; they were easiest to implement and have lowered the computation-cost.

Literature Survey

In this paper, some existing perceptual encryption algorithms of MPEG videos are reviewed and some problems, especially

security defects of two recently proposed MPEG video perceptual encryption schemes, are pointed out. Then, a simpler and more effective design is suggested, which selectively encrypts fixed-length code words (FLC) in MPEG-video bit streams under the control of three perceptibility factors. The proposed design is an encryption configuration that can work with any stream cipher or block cipher. Compared with the previously proposed schemes, the new design provides more useful features, such as strict size-preservation, on-the-fly encryption and multiple perceptibility, which make it possible to support more applications with different requirements. In addition, four different measures are suggested to provide better security against known/chosen-plaintext attacks.

Gaurav Bhatnagar proposed in this paper, the dual tree complex wavelet transform, which is an important tool and recent advancement in signal and image processing, has been generalized by coalescing dual tree complex wavelet transform

and fractional Fourier transform. The new transform, i.e. the fractional dual tree complex wavelet transforms (FrDT-CWT) inherits the excellent mathematical properties of dual tree complex wavelet transform and fractional Fourier transform. Possible applications of the proposed transform are in biometrics, image compression, image transmission, transient signal processing etc. In this paper, biometric is chosen as the primary application and hence a new technique is proposed for securing biometrics during communication and transmission over insecure channel.

Proposed Method

In this section, a new image encryption algorithm is proposed and its application in information security is verified for medical images. The encryption algorithm uses five parameters of (X^0, u, k, N_0, l_p) as the security key. The diagrams of the proposed cryptosystem are shown in (Figure 1).

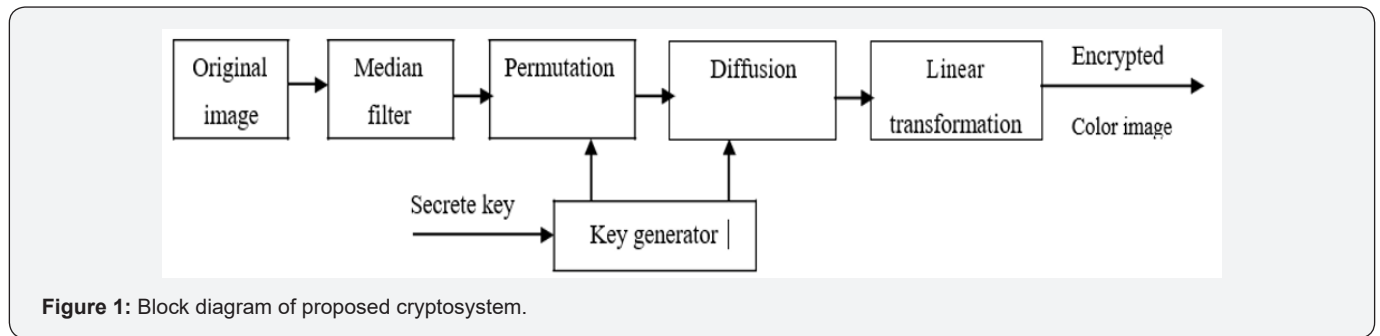


Figure 1: Block diagram of proposed cryptosystem.

Encryption Process

Step 1: The size of the color image of is $M \times N$ divided into 3 images with R, G and B channels respectively, and then the three images are linked to make a grayscale image with the size of $M \times 3N$. In this case of the Grayscale image with the size of $M \times N$, it will be used without conversion.

Step 2: medical images have more noise than we can use A median filter the median filter is used to remove noise from images.

Step 3: The image of grayscale is obtained above is converted

into the 1D image pixel matrix $P = \{p_1, p_2, \dots, p_{M \times 3N}\}$ with the size of $M \times 3N$.

Step 4: X is used in the chaotic system encryption is getting in the new chaotic system. The initial values are x_0, u and k of the chaotic system and is used as the security keys. the new chaotic system is $(M \times 3N + N_0)$ times and discard the former N_0 elements to make a new sequence with $M \times 3N$ elements. Where N_0 is a constant used as the security key.

Step 5: we can use and getting the permutation position matrix $X' = \{X'_1, X'_2, \dots, X'_M \times 3N\}$ by sorting the chaotic sequence X in ascending order. The process is shown in below (Figure 2).

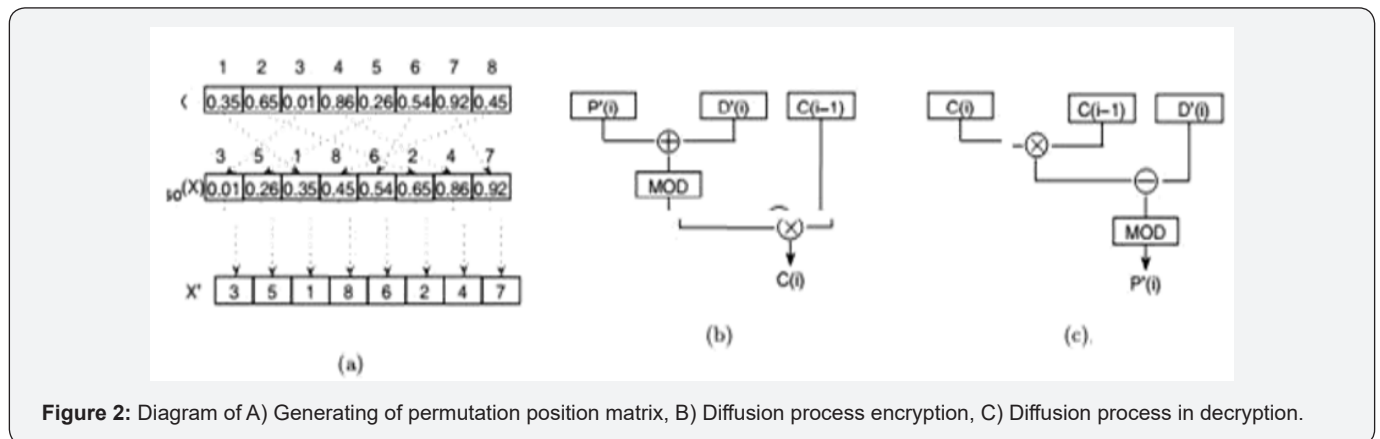


Figure 2: Diagram of A) Generating of permutation position matrix, B) Diffusion process encryption, C) Diffusion process in decryption.

Step 6: The permuted image pixel matrix $P' = \{p'1, p'2, \dots, p'M \times 3N\}$ by using the permutation position matrix X' and the image pixel matrix P . Permutation equation can express as follows.

$$P'(i) = P(X'(i)); \quad (1)$$

Step 7: Diffusion matrix $D' = \{d'1, d'2, \dots, d'M \times 3N\}$ then the by the following equation.

$$D'(i) = \text{mod}(\text{floor}(X(i) \times 10^{14}), 256); \quad (2)$$

Step 8: Obtain the encrypted image pixel matrix

$C = \{C1, C2, \dots, CM \times 3N\}$ from the diffusion matrix D' and the permuted image matrix P' by the following diffusion equation is.

$$C(i) = \text{mod}(P'(i) \oplus D'(i), 256) \oplus C(i-1); \quad (3)$$

Where \oplus is the arithmetic plus operator, \otimes bit-level XOR operator, and $C(i-1)$ the previous encrypted pixel. The process is shown in (Figure 3).

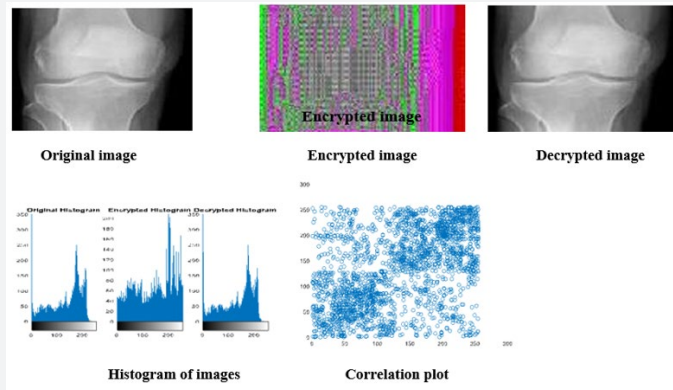


Figure 3: Previous work of MRI Image for knee joint of leg.

Step 9: A new encrypted image pixel matrix by $C' = \{C'1, C'2, \dots, C'M \times 3N\}$ rotating the above obtained encrypted matrix C to the left by the amount of lp .

Where l_p is used as a security key and $1P \in [1, M \times 3N]$. The new image pixel matrix C' is obtained in the following equation.

$$\begin{cases} C''(i-lp) = C(i); & i-lp \geq 1 \\ C''(i-lp) + M \times N = C(i); & i-lp < 1 \end{cases} \quad (4)$$

The step 9 not only avoids the repetition of linear (permutation)-nonlinear (diffusion) conversion to shorten the encryption time, but also increases the strength of encryption.

Step 10: Apply Histogram equalization for encrypted image to get improved encrypted image.

Step 11: Convert them into the R, G and B color image with the size of $M \times N$

Decryption Process

The decryption is the inverse process of encryption. The permutation and diffusion equations used in decryption are as follows.

$$P(X_0(i)) = P_0(i); \quad (5)$$

$$P_0(i) = \text{mod}(C(i) \otimes C(i-1) D_0(i), 256); \quad (6)$$

Where \ominus is the arithmetic minus operator. The process of the equation (6) is shown in (Figure 4). The encryption and decryption algorithms are simple, but they are enough to increase the strength of encryption. They can be applied not only to color image, but also to grayscale image (Table 1).

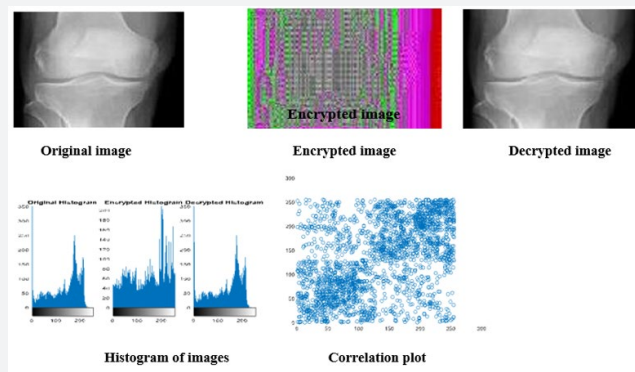


Figure 4: Present work of MRI Image for knee joint of leg.

Table 1: MSE and PSNR results of proposed and extension methods.

Images	Proposed work		Extension work	
	MSE	PSNR	MSE	PSNR
1	44.42822	31.6542	21.08691	34.89067
2	20.26567	35.06319	2.049133	45.0151

Results

Differential Analysis of Medical Image

In the 1D chaotic algorithm is very specific for medical images, in order to test the effect of a pixel change on the entire cipher Image, present work is usually compared with existing

work: The Number of Pixels Change Rate (NPCR) and the Unified Change Intensity (UACI). (Table 2): lists the medical image of NPCR and UACI values. As can be seen from (Table 2): different values of present and existing work encryption, the NPCR value very close to 1 and UACI value close to 0 [33-37].

Table 2: Correlation, NPCR and UPCI values of proposed and extension methods.

Images	Time (sec)	Proposed work				Extension work				
		Vertical correlation	Horizontal correlation	NPCR	UPCI	Time	Vertical correlation	Horizontal Correlation	NPCR	UPCI
1	2.71	-0.023	0.556957	0.99609	0.33463	0.42	-0.06056	0.533729	0.99609	0.33463
2	4.47	-0.4907	0.063144	0.996	0.33463	0.43	-0.56614	0.101228	0.99609	0.33463

Conclusion

As we saw, the security issues for Medical Images are the same as for any medical data. At the frontier between information security and trust during medical practice, we propose to express it in terms of Confidentiality, Availability Reliability, with output data integrity & authenticity this such a framework results modifying medical image accidental during communicating lossy image compressing cause unexpected loss data image causing misdiagnose and responsibly physician shows interprets image not informed .

This paper, first, we proposed a method of making very simple and high effective chaotic system by using a difference of output sequences of the two same existing one-dimension 1D chaotic maps. Simulations, performance and evaluations showed that this proposed system is proficiency to produce a one-dimension (1D) chaotic system with better chaotic performances and wider chaotic ranges compared with the previous chaotic maps. Secondly, we proposed a novel encryption system of linear-nonlinear-linear structure based on total shuffling to confirm its applications in medical image encryption. Experiments and security analysis proved that the algorithm has an excellent performance in medical image encryption and various attacks. For extension we applied median filter to remove the noise from input medical image as well as at encryption stage we applied histogram equalization.

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