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Page No.

Authors:	**Akhiya Sanal, Pruthiraj Swain, Ashoka Shyamaprasad**
Paper Title:	**Analysis of Black Start of a Microgrid with PV, DG, and BESS**

Abstract: Different combinations of operating scenarios for a microgrid with distributed energy resources and energy storage system is considered to understand the operation of a microgrid. An operational strategy analysis of a microgrid system consisting of photovoltaics, diesel generator, and battery energy storage system during a black start in islanded mode is considered in this paper. BESS under study consists of a bidirectional converter and a battery system. BESS is assumed to be active as a solution provided in all the scenarios. The various capabilities of BESS in a microgrid system is also discussed. Microgrid system provides reliable power supply and hence black start capability for such a system is essential in keeping intact the advantages of a microgrid. Performing a black start requires a sequential process to be followed to avoid fluctuations in bus voltage, frequency, and protecting the fuses/ contactors from blowing. To black start the system under study, the DC breaker connecting the battery and the bidirectional converter needs to be closed. Closing the DC breaker results in high inrush current from batteries at the DC output of the bidirectional converter. A DC arrangement is envisaged in the battery energy storage system to avoid arcing due to high inrush current.

Keywords: Battery Energy Storage System, Black Start, Diesel Generator, Environmental Impact, Microgrid, Photovoltaic, Reliability, Renewables.

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2.

Authors: **Ananda M. H, M. R. Shivakumar**

Paper Title: **Effective Utilization of Transmission Line Capacity in a Meshed Network with Series Capacitor Upto its Thermal Limit**

Abstract: Power system networks are becoming interconnected for the purpose of power delivery to decrease the overall power generation cost. With insufficient control, the power systems become more complicated to function and less secure. The economics of AC power transmission have always forced the planning engineers to transmit as much power as possible through a given transmission line. The smaller and thermally limited lines are crowded in many networks while other higher capacity lines run well below their thermal maximum. When series capacitors are introduced in the higher voltage cables, power may be transferred from the overloaded lines, maximizing the use of the existing line as well as complementing the performance of the power system. In this paper, a three-line meshed power system network with different thermal line limits is considered for the purpose of showing effective utilization of line network for maximum power flow through the intended line with series capacitor compensation. The simulations are performed by using PowerWorld simulator confirms the addition of series capacitor increases the power transfer through the line up to its thermal limit.

Keywords: Transmission interconnection, power flow, thermal limit, uprating transmission capacity, Series capacitor compensation.

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3.

Authors: **Rajashekar P. Mandi, Udaykumar R. Yaragatti**

Paper Title: **Enhancement of Energy Efficiency of Hydro Turbine Generators by Energy Conservation Techniques**

Abstract: This paper describes the results of enhancing energy efficiency of hydro turbines by implementing the energy conservation measures for hydro turbine generators. The procedure for evaluating the on-line performance of generators is discussed. The energy saving in generators by maintaining optimum generator terminal voltage, by reducing the stator winding temperature by improving the performance of coolers and

reducing the excitation loss by appropriate tuning of excitation system are enumerated in details with case studies. The implementation of energy conservation measures have a techno-economic feasibility with a payback period of 1 to 5 years.

Keywords: Generator; Hydro turbine; Energy efficiency; Stator copper loss; Rotor copper loss; Generator cooling; Generator excitation;

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4.

Authors: **Burri Ankaiah, Rajashekar P. Mandi , Sujo Oommen, Aditya Balllaji, K. Narayana Swamy**

Paper Title: **A Novel Technique of Piezoelectric Energy Harvesting**

Abstract: Energy harvesting is the technology to extract energy from environment with many surrounding sources of energy. From these sources it is used to extract less electrical power energy and boost up tiny electrical systems or amount of energy stored in a battery. Many methods in energy harvesting among one of the method for harvesting energy is piezoelectric transducers. Energy harvesting depends upon so many factors like conducting circuit, number of sensors, and coupling coefficient of piezoelectric sensors with electromechanical. For large scale applications, one of the best suited technique energy harvesting .

Keywords: Converter circuit, Energy harvesting, Sound buzzers, sensor piezoelectric transducer, storage device/load, Scheme of arrangement.

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5.

Authors: **Josephine Doriya J , Krithika B , Divyanshi Agarwal, Mahesh Kumar**

Paper Title: **Waste Sorting Dustbin with Arduino based Smart Motor Rotating Tray**

Abstract: Due to continuous growth in technology and industrialization there is rapid increase in the type and the volume of waste being generated. People throw garbage without realizing that it is affecting their own health and will degrade the future generation's living standards. In India, majority of waste is being disposed in a very unsatisfactory manner. Ensuring efficient waste management is becoming a threat for the government. For a developing country like INDIA, upgrading the current method of waste disposal is of utmost importance. One of the undeniable fact is that, if we continue to dump land sites at the current rate it may lead to severe environmental hazards. This may not only have an impact on environment, but also on the health of the society. This paper proposes a system in which waste is segregated at a basic level itself. This is achieved by using sensors for different types of waste. Once waste is been detected it has to be dropped into the slot allotted for it. This is done by dividing the bin into different slots using PVC solid sheet. A motor wing action is employed to drop the waste into appropriate slot.

Keywords: segregator, motor-wing action, sensors.

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6.

Authors: **Naini Raju Manchala, Sreedevi J, Rajshekar P mandi, Meera K.S**

Paper Title: **Circulating Current Suppression Control in Surrogate Network of MMC- HVDC System**

Abstract: Modular multilevel converter consists of hundreds of submodules (SMs) like half bridge and full bridge converters etc. These hundreds of SMs and electrical nodes poses challenges while computing electromagnetic transients (EMTs). This problem becomes more complex while computed in real-time. To overcome this, an equivalent topology to model MMC arm/valve called surrogate network is utilized. But, the major ambiguity integrated with surrogate network model is SM capacitor voltage balancing. This leads to variation in voltage among the three phases which are parallel and produces circulating current between the three phases. A control circuitry is proposed in this paper to suppress/minimize circulating currents between the phases. Apart from circulating current suppression, the ‘ac’ output voltage is also enhanced at the converter with this proposed controller. Simulation is carried out in RSCAD software using RTDS simulator.

Keywords: Modular multilevel converter (MMC). Surrogate network. Circulating currents in MMC.

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	Authors:	**Rajini. H, K. N. Ravi,Vasudev. N**
	Paper Title:	**Pollution Performance of RTV Coated Insulators**

Abstract: Theincrease in power demand necessitates the usage of EHV and UHV transmission system. The growth of industries causes higher pollution level in the ambient condition on insulators. This increases the pollution severity of the site which results in pollution accumulation on the surface of Insulators. This causes flashover across insulator. Flashover across polluted insulators poses a serious threat to the reliability of the system and leads to system outages. There are many remedial measures to minimize the flashover of a porcelain insulator under pollution conditions. One such method is the application of hydrophobic coatings such as Room Temperature Vulcanizing Silicone Rubber on the surface of ceramic insulators. Laboratory testing of coated insulators has been carried out based on the solid layer method and by the inclined plane tests at constant voltage to evaluate the RTV coatings withstands capability against tracking and erosion. The performance of the coatings was assessed by monitoring the leakage current on the insulator surfaces. The applied voltage and leakage current were monitored throughout the tests. In order to optimize and economize the usage of RTV coatings various tests were performed and results are analyzed. It was possible to conclude from the test results that one fourth length of RTV coating is sufficient to withstand the pollution severity.

Keywords: RTV, Leakage current, Pollution, Scintillation.

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	Authors:	**Saahithi S, Rajashekar P Mandi**
	Paper Title:	**Technological Advances of Speed Control of Induction Motor with PI and Fuzzy Logic Controllers**

Abstract: At the present scenario, three-phase induction motors (IM) are having wide applications in the industries. So, the need for an effective controlling technique is compulsory. Various techniques are there to control the speed of IM. Soft computing techniques are having in a great improvement in the recent trends. This paper discusses on the scalar control technique of induction motor for conventional PI and fuzzy logic controller. The performance of an induction motor is simulated using MATLAB/Simulink with PI and fuzzy controllers, the results are analyzed and the techno feasibility of both the controllers is presented in detail. Torque-speed (T-N) characteristics of an induction motor for a traditional PI model are considered and compared with rules-based fuzzy logic.

Keywords: Fuzzy Logic, Induction motor, MATLAB/Simulink.

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Authors: **Naini Raju Manchala, Sreedevi J, Rajashekar P Mandi, Meera K.S**

Paper Title: **Real Time Simulation of Wind Farm Connected MMC-HVDC System**

Abstract: Real time simulators play a major role in R&D of Offshore wind farm connected modular multilevel converter (MMC)-HVDC system. These simulators are used for testing the actual prototype of controllers or protection equipment required for the system under study. Modular multilevel converter comprises of number of sub modules (SMs) like Half/ full bridge cells. While computing time domain Electromagnetic transients (EMTs) with the system having large number of SMs pose a great challenge. This computational burden will be more when simulated in real time. To overcome this, several authors proposed equivalent mathematical model of MMC. This paper proposes the real time simulation start-up of offshore wind farm connected modular multilevel converter (MMC)-HVDC system. This paper also describes about how the above said systems is simulated in OPAL-RT based Hypersim software.

Keywords: Modular multilevel converter, Offshore wind farm, Real-time simulator, FPGA

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Authors:	**Noorcheshma P, Sreedevi J, Meera KS, V. Sivaprasad**
Paper Title:	**Steady State and Transient Analysis of FSIG and DFIG Integration to Grid for Different Penetration Levels using VSC-HVDC**

Abstract: Among all the Renewable Energy Sources Wind energy is the fastest growing energy source over the last decade mainly due to crucial developments of technology in wind energy. Nowadays, the penetration of wind energy is increasing in many countries in the world including India. The power system stability with large penetration of wind power is a concern for many electrical utilities. The common technical issues with increased penetration of wind energy are voltage and reactive power control, frequency control and Low Voltage Ride Through (LVRT) capability. The VSC-HVDC system with its benefit of independent control of active and reactive power promises to enhance the system stability at high penetration levels. The maximum wind penetration levels in to the grid is analysed for Fixed Speed Induction Generator (FSIG) & Doubly Fed Induction Generator (DFIG). The penetration levels are further enhanced by considering the evacuation of wind power with VSC-HVDC system without losing system stability. Different controllers for VSC-HVDC system are used to improve the stability and LVRT capability. Standard Benchmark System is considered, and the simulations are performed by using power system simulation software SIMPOW. Results shows that wind power evacuated through VSC-HVDC system has better stability and LVRT Capability compared to AC system at high wind penetration levels.

Keywords: Wind Farm, Wind Penetration, Fixed Speed Induction Generator, Doubly Fed Induction Generator, Low Voltage Ride Through, VSC-HVDC.

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11.	**Authors:**	**Victor George, Pradipkumar Dixit, Madhuri. A, Sayantani Gupta, Vismayi. V**
	Paper Title:	**Cloud based Electric Vehicle Load Management at DC Charging Stations**

Abstract: DC distribution system is getting wider acceptance around the world due to the reduction of conversion stages between AC and DC and the increased popularity of DC loads. Solar PV is a genuine source of DC which can directly power the DC loads like electric vehicle (EV) battery for charging. Increased deployment of Electric vehicles need more charging stations, preferably powered with renewable DC sources or DC microgrid. The intermittent nature of solar power necessitates a backup support from the AC grid. An attempt is made to develop a load management system at a DC charging station powered from renewable sources. The proposed load management system can manage the various DC loads at the charging station based on the power rating of the charging equipment, available solar power and the availability of the backup AC grid. The entire system is automated and enabled with IoT in order to receive the available solar power data through a cloud based communication system. Identification of grid failure, instantaneous load changes and communication infrastructure through cloud for updating the generation profiles are the key concerns of the proposed system.

Keywords: Charging stations, DC loads, DC microgrid, grid failure,IoT, load management.

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12.	**Authors:**	**Rajashekar P. Mandi, Udaykumar R. Yaragatti**
	Paper Title:	**Performance Improvement of Process Draft Fans in Coal Based Power Plants**

Abstract: Indian energy sector mainly depends on the fossil fuel based power plants especially coal based power plants. The performance of coal based power plants in India is poor compared to other advanced countries due to prolonged use of smaller size power plants who have served more than 35 – 40 year with refurbishments and poor coal quality. The auxiliary power in thermal power plant plays a major role in performance of plants because the average auxiliary power consumption varies between 7.5 – 14.3% of plant load depending on the plant size. In this paper the avenues for improving the power plant performance by implementing the energy conservation measures like reducing the hydrodynamic resistance in flue gas & air ducts through clearing the debris, control of illegal furnace ingress, efficient control techniques, cleaning air baskets in air preheaters, operational optimization, variable frequency drives, etc. that reduces the energy consumption by 5.5 to 6.5 MU/year which reduces the overall auxiliary power by 0.5% of plant load.

Keywords: auxiliary power; energy conservation; induced draft fans: forced draft fans; primary air fans; air pre-

heaters;

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13.	**Authors:**	**Rajeev Kumar Chauhan, Dipti Saxena, Jai Prakash Pandey**
	Paper Title:	**Automated Bearing Fault Diagnosis using Packet Features of Vibration Signal and Gaussian Support Vector Machine**

Abstract: Effective detection of the bearing fault and, specifically performance dilapidation assessment of a bearing is the topic of intensive analysis that may scale back prices and therefore the nonscheduled down time. This article presents an adaptive approach that is based on Bhattacharya space ranking method and dimensional reduction method as general discriminate analysis (GDA) with Gaussian support vector machine (GSVM) to accurately detect the defects of rolling bearing. For this investigation, first, vibration signal generated by rolling bearing was disintegrated to five levels employing wavelet packet (WP) method. Sixty three logarithmic wavelet packet features (LWPFs) were taken out from five level disintegrated vibration signals. After this, sixty three features were ranked by Bhattacharya space and top ten LWPFs were chosen. The top ten features were reduced to a new feature using GDA for effective detection and then applied to GSVM for detection of bearing fault. The experimental results show that new automated diagnosing approach attained classifier performance parameters as sensitivity (SE) or true positive rate, specificity (SP) or true negative rate, accuracy (AC) and positive prediction value (PPV) of 100, 98.50, 100 and 99.67 % for inner raceway (IR) and, AC: 99.49, SE: 100, SP: 98.78 and PPV: 99.87 for ball bearing (BB) at 0.18 mm diameter faults.

Keywords: Bhattacharya space ranking method, ball bearing (BB) defect, Gaussian support vector machine, General Discriminate Analysis, inner race (IR), wavelet packet.

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14.

Authors:	**K. Narayana Swamy, Nandeesh M, Nagaraj Hediyal**
Paper Title:	**Modeling, Characterization and linearization of Negative Temperature Coefficient (NTC) Thermistor and Pressure Sensors**

Abstract: Industrial applications such as air-conditioning, microelectronic, automotive, food processing are automated using various sensor technologies. The sensor technologies could be temperature, pressure and others as well. The negative temperature coefficient (NTC) sensors are the preferred choice due to their stability over their counterpart positive temperature coefficient (PTC) sensors. These sensors are highly nonlinear and need special signal conditioning circuits to use them in all industrial applications. Pressure sensor does need a special treatment while measuring their values for industrial applications. This paper presents the method to model, characterize and linearize NTC and pressure sensors. A low-cost system was built to validate the presented method.

Keywords: Temperature, NTC/PTC, Coefficient, Modeling, Characterization, Linearization, pressure sensor.

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Authors:	**N. Himabindu, Rajashekar P. Mandi**
Paper Title:	**Energy Management Optimization Techniques for Hybrid Renewable Energy Systems**

Abstract: A Smart Grid is a reviving structure of traditional centralized power sector which incorporates smart software and hardware technologies. It provides communication among the prosumers and consumers to achieve sustainability and reliability in an economical way. A microgrid (MG) is a unit of smart grid which consists of distributed energy sources with renewable energy sources, energy storage units and variable loads. Because of stochastic nature of renewable energy sources to maintain balance between supply and demand a novel hybrid energy management controller need to be devised. This paper presents various operational objectives and constraints associated with energy management system of hybrid energy system. Also it compares and discusses various optimization algorithms in the literature.

Keywords: Greenhouse gases (GHG), Hybrid Renewable Energy Sources(HRES) ,Information and Communications Technology (ICT), Smart Grid(SG), Optimization, Energy Management System (EMS)

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16.

Authors: **Bharathi V, M V Chilukuri, Arunachalam M**

Paper Title: **An Anatomization of Microgrids**

Abstract: microgrid is a set of loads that are connected with each other and distributed energy resources within distinctly designate electrical boundary in such a way, it behaves as a one unit in regard to the grid. A micro grid associated with distributed energy resources (DER) has proved alternate sources of electricity rather than the fossil fuels likecoal. The consequential comfort associated with microgrids has paved the way to extend their perforation in a network of electrical components. There are many challenges and issues in integrating the micro grid to the utility grid. Research activities are in progress to solve the issues like design of a microgrid, control techniques and operating modes such as grid connected or islanded mode. This paper extends an exploration of issues concerning microgrids and furnishes the details of solutions suggested by researchers in areas of microgrids, including microgrid architecture, operation and control, DER, microgrid controllers, converters, energy management, protection and challenges which are yet to be addressed.

Keywords: Microgrids, Distributed energy resources, operation and its control, protection schemes, hybrid energy storage systems, state of charge, power sharing unit, DC/DC converter.

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	Authors:	**Chinmaya Kulkarni, Gurubasu Hombal, Sachin Angadi, A. B. Raju**
	Paper Title:	**Direct Torque Control for Induction Motor Drive with Reduced Torque and Flux Ripples**

Abstract: The most universally used electric motor is an induction motor fed with three phase supply and eighty percent of mechanical power utilized by industries is given by three phase asynchronous ac motor. Direct torque control method is one such technique for controlling flux and torque of an asynchronous motor fed with PWM VSI. Without any complex control algorithms, it provides easy commands for the control of induction motor flux as well as torque. We are demonstrating the principle of DTC of an asynchromous motor using three level hysteresis controller in this paper. Philosophy of DTC with aforementioned control method has been simulated using MATLAB/Simulink.

Keywords: Direct Torque Control, Inverter, and Hysteresis Controller, rotating magnetic field.

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18.	**Authors:**	**Sincy Elezebeth Kuruvilla, M Arunachalam**

	Paper Title:	**Comparison of Estimated Power Transfer in Transmission Line With and Without Shunt Compensator Using Different Line Models**	
	Abstract: In power systems, compensation techniques are used to improve the power transfer capacity in the transmission lines. Controlling the voltage profile along the line helps to control the transmittable power and this is achieved through compensation techniques. In this paper, different line models are used for the estimated power transmitted in the line both with and without shunt compensation. It is observed that with the Bergeron line model and PI-section model the estimated power is higher compared to that with the series RL model both with and without shunt compensation. PSCAD is used for the simulation. **Keywords:** Bergeron model, PI-Section, Power Angle Curve, Shunt compensation, Transmission line. **References:** 1. R. D. Evans, H. K. Sels, "Power Limitations of Transmission Systems", Journal of the A.I.E.E, Vol. 43, Issue 1, 1924, pp 45-51 2. M. H. Haque, "Stability Improvement by FACTS Devices: A comparison between STATCOM and SSSC", IEEE Power Engineering SocietyGeneral Meeting, June 2005, Print ISSN 1932-5517. 3. M. Shafiul Alam, Md.Abdur Razzak, Md. Nazmul Hasan, "Transmission capacity Enhancement of East West Interconnectors using series shunt compensation", 7th International Conference on Electrical and Computer Engineering, pp 579-582, 2012. 4. M. Venkateshwara Rao, S. Sivanagaraju, Chintalapudi V Suresh, "Available transfer capability evaluation and enhancement using various FACTS controllers: Special focus on system security", Ain Shams Engineering Journal, Vol 7, Issue 1, March 2016, pp 191-207. 5. Esther Barrios, Cesar Angeles, "Technical comparison of FACTS controllers in parallel connection", Journal of Applied Research and Technology, Feb – 2017, Vol. 15, Issue 1, pp 36-44. 6. Mohd. Azharuddin, S. R. Gaigowal, "Voltage Regulation by grid connected PV- STATCOM", IEEE Conf., March – 2017. 7. Sridhar Bala Subramanian, Sibin Mohan, Mohammad Akbari, Hesamaldin Maleki, Reza Salehi, Wayne H. Litzenberger (Vice Chair), and Rajiv K. Varma (Chair), "Control Of STATCOMs – A Review", IEEE Power and Energy Society General Meeting (PESGM), December – 2018. 8. Saraswathi Ananthavel, Sanjeevikumar Padmanabhan, Sutha Shanmugham, Frede Blaabjerg, Ahmet H Ertas, Viliam Fedak, "Analysis of enhancement in available power transfer capacity by STATCOM integrated SMES by numerical simulation studies", Engineering Science and Technology, an International Journal, Vol. 19, Issue 2, June 2016, pp 671-675. 9. E. C. M. da Costa, S. Kurokawa, A. A. Shinoda, J. Pissolato, "Digital filtering of oscillations intrinsic to transmission line modeling based on lumped parameters," Int. Electr. Power Energy Syst., vol. 44, pp. 908- 915, 2013. 10. Andreas I. Chrysochos, Georgios P. Tsolaridis, Theofilos A. Papadopoulos, and Grigoris K. Papagiannis, "Damping of Oscillations Related to Lumped-Parameter Transmission Line Modeling," Research Gate, Conference paper -2015. 11. Narain G Hingorani, Laszio Gyugi, "Understanding Facts: Concepts and Technology of Flexible AC Transmission Systems", IEEE Power Engineering Society, John Wiley and Sons, Inc., Publication. 12. DebashishMondal, Abhijit Chakrabarti, Aparajita Sengupta, "Chapter 7 - Application of FACTS Controller", Power System Small Signal Stability Analysis and Control, 2014, pp -185 – 225. 13. https://hvdc.ca/webhelp/PSCAD/Transmission_Lines_and_Cables/Transmission_Lines_and_Cables.htm 14. Naret Suyaroj, Suttichai Premrudeepreechacharn, Neville Robert Watson, "Transient state estimation with the Bergeron transmission line model," Turk J Elec Eng & Comp Sci 25: 806-819, 2017. 15. M.Arunachalam, GhammandiLal, C.G. Rajiv, M.M.Babu Narayanan,"Performance Evaluation of TCSC Control and Protection Equipment using RTDS", 15th Power System Computation Conference (PSCC), August 2006.	**107-112**
19.	**Authors:**	**Mohammed Munazzaruddin, Dhandaria Neelam, Mohammed Mateen, Rizwan Khan**	
	Paper Title:	**Faculty Feedback Analysis System with Efficient Graph-Based Reports**	
	Abstract: Feedback plays a vital role in the uprising of any educational institute. With the help of the proper Feedback analysis system the growth rate of the Institute will display an Inclination in its performance. For reputed Institutions which have large number of students, it is not easy to manage a proper feedback system manually, hence there is need for an automation in Faculty Feedback System Faculty Feedback Analysis System is a dynamic web application which is aimed to be anonymous while taking feedback from students and generate efficient and effective reports as prescribed by the NBA & UGC. The registered students of that particular institute can give the feedback of their faculty of present semester. While giving feedback, the student can see only his/her respective subjects and subject handling faculty names. The feedback form also shows Open Elective and Professional Elective subjects of the students based on their chosen choice. This system also provides the facility to the faculty to check their feedback at any point of time after the feedback is taken. It makes it easier for admin to view reports of all the previously taken feedback. This application is designed in such a way that it can be deployed in real time on a cloud server and can be accessed through smart phones and any small computing devices. All the passwords are encrypted with custom made encryption algorithm to secure the system from all the possible corners. The application has a ready and not ready state which will allow or not allow students to give feedback and will be managed from the admin panel which is beautifully created to be as user- friendly as it can get.The feedback form is also designed in two different models one for large screens where photos of the faculties are also presented with names and another for Smart phones which has its own beautiful custom made design-build for it. Overall performance wise it has been improved over the development cycle starting from version 1.0 to version 4.0.Various types of reports can be generated from the given feedback based on the admin requirements. **Keywords:** Faculty Feedback Analysis System, feedback Mechanism, graph based reports for feedback, Automatic Feedback system, and anonymous feedback system. **References:**	**113-115**

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Authors: **G. Ravi kishore, N. M. Nandhitha**

Paper Title: **Optimization Method for Delay and Power Using Enhanced CSS FLIP FLOP with 24 Transistors**

Abstract: New way optimization method is an Enhanced CSS F^2A new method titled in this paper to explain the improved flip flop design with 24 transistor's using circuit-shared static flip-flop (ECSSFlip Flop).this implementation enhances power and delay where we utilize 5 NOR gates and 2 INV's(inverters), these methods are these methods are utilized in the quality cell libraries, The ECSS FLIP FLOP utilizes a positive intercessor clock signal, it is produced from a main clock, to require information into a main latch and a negative fringe of the foundation clock to carry the info during a gated latch. Cadence(Virtuoso) simulations at 180-µm found optimized at different frequency now the ability by a power dissipation of 9.516nW and delay by 3.634 ns in comparison to CSS FLIP FLOP

Keywords: ECSS FLIP FLOP, FLIP FLOP (F^2), Power, Delay, gate.

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21.

Authors: **Sudharani Potturi, Rajashekar P. Mandi**

Paper Title: **Latest Advances in DTC Control of Induction Motors**

Abstract: In these days, developments in the area of Induction Motor control is increasing significantly. Considerable advancements have been taken place in the area of Direct Torque Control (DTC), which is capable of providing quick dynamic response with respect to torque and flux. This paper presents a detailed survey on various latest techniques of DTC control of Induction Motor such as DTC-SVM with hysteresis band, DTC-SVM with Model Predictive Control, DTC with sliding mode control, DTC with Model reference adaptive system (MRAS) et cetera. The simulation results are discussed for DTC-SVPWM topology and results obtained proves that this method has reduced torque ripple

Keywords: Induction Motor, DTC, SVM, Predictive Control, MRAS, sliding mode et cetera.

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Authors: **Sachin Angadi, Divya C. Badiger, Udaykumar R. Yaragatti, A. B. Raju**

Paper Title: **Experimental Verification of MPPT Algorithms for Photovoltaic systems**

Abstract: Changing meteorological conditions influence the output power of the Photovolataic systems, which affect the overall performance of the system, in turn reduces the overall efficiency. So, to draw maximal power from the PV system a technique called maximum power point tracking (MPPT) is incorporated. Two perturbations-based algorithms are presented in this paper are Perturb and Observe (P&O), and Modified drift-free perturb and observe (MP&O). Fixed step size duty ratio is used in both of these algorithms. The boost converter is used between the photovoltaic module and the resistive Load. The simulation and experimental results for 250W PV module are presented. The simulation studies are carried out in MATLAB SIMULINK. The algorithms are implemented using TMS320F28069M.

Keywords: Boost converter, Duty ratio, Maximum Power Point Tracking, Perturb and Observe, Modified drift-free Perturb and Observe.

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23.

Authors: **Divya Jain, Parshavi Bolya, Aaditya Maheshwari, Yogendra Singh Solanki**

Paper Title: **Data Analysis on Chronic Kidney Disease Prognosis**

Abstract: We have taken our dataset from UCI Machine Learning Repository. Our study is about Chronic Kidney Diseases based on 24 input attributes to produce one output attribute i.e. a patient is suffering from chronic kidney disease or not. We have used three major attributes in our study i.e. PCV, RBCC and Hemoglobin with respect to Age for optimum result. These attributes play major role in our study.

Keywords: CKD, Analytics, Weka, PCV, RBCC, Hemoglobin.

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24.

Authors: **Jitendra Shreemali, Praveen Galav, Gaurav Kumawat, Pankaj Chittora**

Paper Title: **Rainfall Prediction for Udaipur, Rajasthan Using Machine Learning Models Based on Temperature, Vapour Pressure and Relative Humidity**

Abstract: The study aims at Rainfall prediction using Machine Learning models using the minimum of features. The prediction here is based on temperature, vapour pressure and relative humidity. Numerous studies carried out earlier used more features than this study. A training-test split of 75-25 was used. The best results were obtained by combining the best of the candidate models into an ensemble model to identify that predictor importance of vapour pressure was 0.89 while that of relative humidity was 0.11 with temperature not seen as a significant predictor for rainfall though the high correlation of temperature (°C) with vapour pressure (Torr) and relative humidity (Percentage) suggests that the two predictor variables subsume the impact of temperature.

Keywords: Rainfall prediction, Neural Network, Ensemble model, CHAID, Random Forest.

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Authors: **Sangeeta Choudhary, Prem Choudhary**

Paper Title: **Sediment Yield and Sand Erosion Model through Arc SWAT and SPSS-14 Software for Sand Mine Site in Rajasthan**

Abstract: Sand mining activities are considered as a profitable venture in present scenario of development, but these activities can cause a great trouble to environment. There are many factors which affects sand erosion of particular area. The main purpose of the study is to establish a mathematical model for sand mining site of the study area to identify the factors affecting the sediment yield and erosion of the sand at mining site. Kosana Sand mining site on Mithri tributary at Luni River near Pipar tehsil in Jodhpur, Rajasthan was selected. Sediment yield is workout based on the observations and calculations of ArcSWAT model. A mathematical model of study area is developed by using SPSS-14 software. Data of surface runoff, sediment yield and erosion are used to formulate a mathematical model. It is found that both erosion and sediment yield are related to surface runoff with cubic equation with value of coefficient of determination (R2) 0.944. The sediment yield at drainage location depends on the surface runoff of the watershed.

Keywords: Sand Mining, Erosion, Surface runoff, Sediment yield, ArcSWAT.

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26.

Authors: **Tanishka Jain, Nayan Sharma**

Paper Title: **Forest Fire Prediction using Machine Learning Models based on DC, Wind and RH**

Abstract: The paper points out forest fire prediction using machine learning models on the basis of viz. DC, Wind, RH out of the several machine learning classifier algorithms, It is relevant that random forest algorithm generates optimum accuracy(99.61%).

Keywords: forest fire, machine learning, DC, Wind, RH.

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27.

Authors: **Ved Prakash Gupta, M Sajid Mansoori, Jitendra Shreemali, Payal Paliwal**

Paper Title: **Predicting Causes of Airplane Crashes using Machine Learning Algorithms**

Abstract: Considering the immense cost of air crashes, the study examines the causes of crashes of aircrafts based on reported findings for the crash. The dataset used for this study included data for all reported air crashes across the globe for the period from 1981 to 2019. The causes were classified into seven categories. Multiple machine learning algorithms were used to identify the best for predicting the likely cause of accident based on features available. The Machine Learning Models used are Auto Classifier, Tree-AS and XGBoost. Also the key predictors are identified for use by planners.

Keywords: Machine Learning, XGBoost, Neural Network, Deep Learning, Tree-AS

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28.	**Authors:**	**Shambhu P. Choubisa, Abhishek Sharma, Himanshu Pandya**	
	Paper Title:	**Analysis of AISI D2 Steel by using SEM Images**	
	Abstract: Hard turning is a new emerging technique in manufacturing industry which involves turning of hard steel having hardness more than 60 HRC. Here in the present work, the objective of the study is steel type ENX160CrMo having hardness 62 HRC. Hard turning were carried out at different cutting parameters and chip hardness and micro- chip SEM images were observed. Micro- machined surface images, observed at different cutting condition to know the relation between chip morphology and micro-structure of the machined surface. White layer formation indicates the reduction in fatigue life was also studied. **Keywords:** Hard turning; Chip formation; AISI D2 steel; White layer; Micro structure of machined surface. **References:** 1. Molinari, C. Musquar and G. Sutter,(2002) Adiabatic shear banding in high speed machining of Ti-6Al-4V: experiments and modeling, International journal of Plasticity, 18: 443-459. 2. G. Sutter,(2005) Chip geometries during high-speed machining for orthogonal cutting conditions, International Journal of MachinesTools &Manufacture, 45 :719-726. 3. Hortig and B. Svendsen, (2007) Simulation of chip formation during high-speed cutting, Journal of Materials ProcessingTechnology, 186:66-77 4. R. Komanduri and R. H. Brown,(1981) the mechanics of chip segmentation in machining, Journal of Engineering for Industry, 103: 33-51. 5. R. Komanduri, T. Schroeder, B. F VonTurkovitch and O. G. Flom, (1982) On the catastrophic shear instability in high speed machining of an AISI 4340 steel, ASME Transaction-Journal ofEngineering for Industry, 104: 121-131. 6. W. Konig, (1990) Machining hard materials with geometrically defined cutting edges-Filed of applications and limitations, Annals of CIRP, 39 :413-425. 7. M. Shaw, (1998) The mechanism of chip formation with hard turning steel, Annals of the CIRP, 39 :77-82. 8. R. Recht,(1964) Catastrophic thermoplastic shear,Journal of Applied Mechanics, 31 :189-193. 9. (9) R. Recht,,(1985) A dynamic analysis of high speed machiningASME Transaction-Journal of Engineering for Industry, 107: 309-315. 10. G. Poulachon, A. Moisan and M. Dessoly, Contribution (2002) àl'étude des mécanismes de coupe en tournagedur, Mécanique& Industries, 3: 291-299.	**148-155**
29.	**Authors:**	**Rajkumar Soni, Tushar Arora, Harshita Kumawat, Bhuveneshwari Dhamala, Himanshu Shekhar Paliwal**	
	Paper Title:	**Real Time Electrical Energy Monitoring and Cost Benefit Analysis using Smart Meter**	
	Abstract: Energy is an essential component in supporting people's daily lives and is a significant economical element in development of the country. The eventual depletion of conventional energy resources and their harmful impacts on environment as well as the rising energy costs and the limitations of new energy resources and technologies have pushed efficient energy management to the top of the agenda. But how the energy utilization can be managed? A simple answer to this is viable and real time metering, which enables calculation of run time energy consumption and obtaining the real-time as well as cumulative cost. In this research an Innovative hardware and IoT based solution to this problem is availed that could provide live information related to consumption of electricity by various appliances. The methodology used in this research is mainly based on a hardware tool named Elite 440 which is a meter and provides the data about various electrical parameters. This data so obtained is made visible on the dashboard in a user friendly. The data so visible includes various parameters like voltage, current, power factor etc. Also the data so obtained on the dashboard gets updated in each five minutes and simultaneously the cost gets updated which makes it real time monitoring System. **Keywords:** MODBUS, Smart Metering, Cloud, Dashboard **References:** 1. F. Abate et. al. "Smart Meter for the IoT", 2018 IEEE International Instrumentation and Measurement Technology Conference (I2MTC). 2. V. Preethi et. al. "DESIGN AND IMPLEMENTATION OF SMART ENERGY METER", 2016 International Conference on Inventive Computation Technologies (ICICT). 3. D.M. Lowe et. al. "Energy efficient induction motors performance characteristics and life cycle cost comparisons for centrifugal loads". 4. IEEE Trans. Industry Applications, vol. 33, no. 5, Sept./Oct. 1997, pp. 1312–1320. 5. BSR Energy Management Handbook, April 2012. 6. Jixuan Zheng et. al. "Smart Meters in Smart Grid: An Overview", 2013 IEEE Green Technologies Conference (Genentech). 7. Fabio Clarizia et. al. "smart meter systems for smart grid management",2016 IEEE International Instrumentation and Measurement Technology Conference Proceedings. 8. A.Subba Rao et. al. "IOT Based Smart Energy Meter Billing Monitoring and Controlling the Loads", International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8 Issue-4S2 March, 2019. 9. The European Council for an Energy Efficient Economy (eceee) 2014. 10. P. O'Callaghan et. al. "Energy management: A comprehensive guide to reducing costs by efficient energy use", McGraw Hill, London, UK, 1992. 11. P. Kadurek et. al., "Theft Detection and Smart Metering Practices and Expectations in the Netherlands" Proc. IEEE PES Innovative Smart Grid Technologies Conf. Europe (ISGT Europe), pp. 1–6, 2010. 12. K. Hieta. V. Kao et. al. "Case Study of Smart Meter Deployment: Recommendations for Ensuring Ratepayer Benefits", March 2012.	**156-160**

30.	**Authors:**	**Parshavi Bolya, Divya Jain**	
	Paper Title:	**Analysis of Breast Cancer dataset using Supervised Machine Learning Classifiers**	
	Abstract: We Have Extracted Our Dataset From Kaggle. Our Study Is About Breast Cancer Diagnosis Based On 31 Input Attributes To Produce One Output Attribute That Is The Type Of Breast Cancer. Our Analysis Is On Two Major Aspects That Are Malignant And Benign On The Basis Of 10 Attributes That Is Texture, Perimeter, Area, Smoothness, Compactness, Concavity, Symmetry, Fractal Dimension, Concave Points And Radius. **Keywords:** Breast Cancer, Malignant, Benign, Fractal Dimension. **References:** 1. Division of cancer prevention and control, centers for disease control and prevention. 2. The American Cancer Society medical and editorial content team. 3. Breast Cancer care at Mayo Clinic. 4. National Breast Cancer Foundation. 5. Differences between a malignant and benign tumor by Lisa Fayed(verywellhealth.com)	**161-163**
31.	**Authors:**	**Prerna Paliwal , Charul Singhvi, Aditya Maheshwari**	
	Paper Title:	**Analysis on Used Car Dataset using Machine Learning Models**	
	Abstract: The research paper focuses on study of used cars of different models based on different fuel types, owner types and years all at different locations and also other factors like Mileage, Engine type, Power consumed and number of seats available. Data is visualized on the basis of Kilometers driven, Fuel Type and Owner Type. **Keywords:** Machine Learning, Models, Fule Types, Owner Type, Engine Capacity, Kilometers driven. **References:** 1. Rose, D. (2003) "Predicting Car Production using a Neural Network Technical Paper- Vetronics (In-house)". Thesis, U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC).R. Rojas: Neural Networks, Springer-Verlag, Berlin, 1996. 2. https://carbiketech.com/engine-capacity-cc/ 3. http://en.citizendium.org/wiki/Energy_consumption_of_cars 4. Mileage: https://en.wikipedia.org/wiki/Mileage.	**164-166**
32.	**Authors:**	**Dhananjay Paliwal, Abhishek Sharma, Shambhu P Choubisa, Himanshu Pandya**	
	Paper Title:	**Go-Kart - A Working Prototype and Related Simulation Analysis using ANSYS**	
	Abstract: A go kart has been designed and developed by mechanical department for the Indian Karting Race (IKR). Indian Karting Race is a national level championship organized and conducted by Imperial Society of Innovative Engineers (ISIE). Various teams from all over the nation try to design and fabricate a low-cost go-kart and then compete with each other in different rounds such as in the designing phase and in safety round. The students had a great chance to prove their knowledge which they gained from the subject of automobile engineering and ic engine. The designing is done in commercial software SolidWorks 2016 and the software ANSYS 14.0 was used to perform finite element analysis. Two designs were made for the comparison so that a suitable design with higher factor of safety, best load consideration and good sporting vehicle can be selected. **Keywords:** Go-Kart, Indian Karting Race, Imperial Society of Innovative Engineers, Finite Element Analysis **References:** 1. Rulebook IKR, Imperial Society of Innovative Engineers 2020. 2. Nayak A.O., Ramkumar, G., Manoj, T., Kannan, M.A., Manik, D., & Chakravarthy, S. (2012). Holistic design and software aided finite element analysis of Off-Road Vehicle. Journal of Mechanical Engineering Research. 3. Parveen Kumar and Harsh Raghuvanshi. (2013) Innovative Design of an All-Terrain Vehicle (ATV). International Journal of Engineering and Advanced Technology (IJEAT). 4. International Journal of Innovative Research in Science, Engineering and Technology (2015). 5. Govardhan Reddy, Md. Hameed, "design report of a go kart vehicle", International Journal of Engineering Applied Sciences and Technology, 2016, Vol. 1, Issue 9, ISSN No. Pages 95- 102, Published Online July – August 2016.	**167-170**
33.	**Authors:**	**Nikita Sharma, Gaurav Suthar, Sayed Aamir Hussain**	
	Paper Title:	**Crushed EPS in Light weight concrete**	
	Abstract: This paper gives light to the ideas of development and implementation of sustainable material to reduce the reliance on non-renewable resources which can be achieved by using light weight concrete in construction as the demand of light weight concrete is growing day by day. The availability of light weight aggregates and admixtures has made this approach easy. Expanded polystyrene (EPS) is a material used for packaging of various products. Due to its voluminous, bulky nature and being non-biodegradable it has high	**171-174**

resistivity towards chemical reactions so its disposal is an issue also when disposed in landfills it covers more space. This paper promotes the use of EPS in light weight concrete structures. Expanded Polystyrene concrete is used in modern applications such as thermally insulated partition walls, exterior walls, members of floating structures and deck of bridges. This work comprises of casting and testing of light weight concrete with EPS as an aggregate, fly ash as finer including sulphonated naphthalene (SN) based admixtures. A canoe is also designed and tested for floating capacity. The percentage ratio of EPS to cement is trialed between (0.25-0.3) by weight percent. As per IS 456-2000 clause 15-17 [1] testing light weight concrete cubes and after evaluating six different compositions, the optimum ratio was adopted.

Keywords: Expanded Polystyrene EPS, fly ash, light weight concrete, sulphonated naphthalene admixtures.

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34.

Authors:	**Bharat Kr. Suthar**
Paper Title:	**Corrosion Monitoring of RC Structures (Assessment and Interpretation)**

Abstract: Reinforced Concrete structure system is more durable and capable from a various adverse environmental condition. Their excellent tensile strength and ductility make them perfect for construction of building structures. Structures are always susceptible to environmental changes. No building will ever be the same once the environmental changes kick in. Out of all the changes, the most serious and devastating in corrosion. Each and every structure needs valuable inspection and proper examination for checking the reinforcement corrosion. There are required assessing and techniques to evaluate and interprets the condition of structures. One can identify the strength of a structure by monitoring techniques and can prevent problem in the structures before it becomes crucial. In this review paper all the non destructive techniques from the point of view of corrosion assessment and application to building and other civil engineering structures are being discussed.

Keywords: Corrosion, Monitoring Application, electro chemical methods.

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9. Peter A Claisse, "Carbonated Concrete" Hanaa I Elsayad and Ibrahim G Shaaban.
10. Ralf ARNDT1, Frank JALINOOS "Corrosion assessment and monitoring" Federal Highway Administration, TFHRC NDE Center, McLean, United States.
11. AI Abu-Tair1 C McParland2 JF Lyness2 A Nadjai "deterioration of concrete structures." Faculty of Engineering Al-Quds University Jerusalem 2 School of the Built Environment University of Ulster N Ireland
12. Zenonas Kamitis "Reinforcement Corrosion" Dept. of Bridges and special structures, Vilnius Gediminas Technical University,Sauletekio.11 LT-2040 VILNIUS, Lithuania
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35.

Authors:	**Ann Mary Thomas, Bhavya Kumawat, Anjali Mewada, Jitendra Shreemali, Prasun Chakrabarti**
Paper Title:	**A Mathematical Modelling of Crimes Against Women in Rajasthan**

Abstract: Crimes against women represent one of the evils of societies more so in societies where women are more vulnerable. Based on the prevailing classification of crimes against women, the study aims at examining whether different crimes behave identically or differently. The mathematical model shows that while crimes like rape and cruelty by husband follow an exponential function, crimes like kidnapping and abduction, assault with the intent to insult their modesty and indecent representation of women follow a (quadratic) polynomial function. Finally, immoral trafficking of women appears to follow none of the functions/distributions considered. Different approaches to addressing these crimes may, therefore, work better than a single approach.

Keywords: Rape, Dowry Death, Assault on Women with Intent to Insult her Modesty, Cruelty by Husband or

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Relatives, Immoral traffic on Women, Indecent Representation of Women.

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36.	**Authors:**	**Rakesh Yadav**
	Paper Title:	**Analysis of Reinforced Concrete Intze Water Tank with Different Staging Heights in Different Seismic Zones**

Abstract: RC intze water tanks are constructed for storage and suppling of water through a certain height with adequate pressure of water distribution. Many overhead water tanks affected due to certainty like earthquake that can induce large lateral forces. So, there is a necessity to Understand and examine the behavior of intze tank supported on framing in context to different soil types under the seismic forces. This paper evaluates the experimental output of seismic analysis that compares shear and moments at base and also hydrodynamic pressure at wall and base slab for various seismic zone and different type of soil condition at different staging heights.

Keywords: Intze water tank, Seismic analysis, Base shear, Base moment. Hydrodynamic pressure, Staging height.

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37.	**Authors:**	**PriyanshaJain, Danish Paliwal, Aditya Maheshwari, Yogendra Singh Solanki**
	Paper Title:	**Supervised Classification Estimate towards Air Pollutant Quantification of Delhi and Udaipur**

Abstract: The paper analyses air quality using supervised machine learning classifiers. The factorsconsidered for parameter selection towardsaffecting air quality are Benzene, BP(Barometer Pressure), PM10(Particulate Matter), PM2.5(Particulate Matter), RH(Relative Humidity), CO(Carbon Monoxide), NH3(Ammonia),

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NO(Nitrogen Oxide), NO2(Nitrogen Dioxide), NOx(Nitrogen Oxides), Ozone, SO2(Sulphur Dioxide).Curve fitting has been applied for analyzingpollutantsin air.

Keywords: Air Quality, Particulate Matter, Nitogen Oxide, Carbon Monoxide, Sulphur Oxides.

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5. Shagun Kapil "India emits the most sulphur dioxide in the world"

38.

Authors: **T Krishnarjuna Rao, M. Srinivasan, D. Lakshmaiah**

Paper Title: **Low Energy Less Area Less Delay Fixed Point LMS Method for Adaptive Noise Cancellation Filter**

Abstract: Present paper is about the high speed low complexity implementation derived by its architecture using least mean square (LMS) adaptive filtering. Here straight form LMS adaptive filter has almost the similar critical path as it is a reverse from of the counter path hoiver it has a fast coverage and also a loir register complication. Here critical path evaluation tells that no pipelining is necessary for implementation of straight form LMS adaptive filtering in most of the practical cases requires a realized extremely small adaptive delay and very high sampling rate. Here based on these finding LMS adaptive filtering is divided into 3 structural proposal designs. a) There is no adaption delay b) Only one adaption delay c) Only two adaption delay. Here first one includes least area and least energy per sample (EPS).

Keywords: least mean square (LMS), extremely

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Paper Title: **Different Types of an Energy Efficient Multicast Routing Protocols for QOS in Wireless Communication**

Abstract: This research paper proposes the "mobile ad hoc networks (MANETs) need aid autonomously self-organized networks without framework backing". For a "mobile ad hoc network, nodes move arbitrarily"; consequently that network might background fast also random topology changes.In view nodes previously, a MANET regularly have set transmission ranges, a percentage node can't correspond specifically with one another. Hence, routing path in mobile networks possibly hold numerous hops, each hub to mobile networks need the obligation on go about as a switch. This paper is an review from research work on "routing protocol for MANET, Mobile Ad Hoc Network" has as of late increased a ton of fame among computer researchers and specialists. "A MANET is an infrastructure less network" with a lot of dynamic, versatile and self-arranging hubs. Intrigue and utilization of remote versatile network have been becoming in the course of the most recent couple of years.MANETs to have a productive multicast directing and a Quality of Service (QoS) component.Multicast for Ad hoc Network with Hybrid Swarm Intelligence convention depends on swarm insight based optimization technique.

Keywords: Uni casting, Multicasting, DVMRP, Reactive and proactive protocol, AODV, MANET, QoS.

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