**ABSTRACTS**

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| **Paper ID: IEEC-2020-04** |
| **Voltage Contingency Ranking of Pakistan National Grid In The Vicinity Of Nuclear Power Plant**  **Abdul Ahad, Naila Zareen, Moaz Ahmad, Muhammad Umer, Abdul Rehman Abbasi and Tauseef-ur-Rehman Khan**  Karachi Institute of Power Engineering (KINPOE) College, PIEAS Karachi ,Pakistan.  To ensure safe control of power system, it is essential to assess the functionality of its components. Thus, to evaluate stability of Pakistan National grid, whole system is implemented in ETAP and Load Flow analysis is done to find the steady state parameters of whole system in normal condition.N-1 contingency analysis is performed to study the parameters after one component failure then voltage stability of region in the vicinity of nuclear power plants is evaluated using performance index which depicts not only voltages but also has relation with reactive power flows. This is done to ensure that nuclear power plant continue to export power in contingency condition as well. Modelled system provides a platform to perform transient stability analysis and fault analysis as well. |
| **Paper ID: IEEC-2020-05** |
| **Experimental-Based Performance Evaluation of Photovoltaic Solar System**  **Ahmad Rafay Asad, Muhammad Riaz, Rabia Attiqa**  The University of Lahore, Islamabad  Conversion of solar energy into electrical energy is a very useful technique by knowing that such source of energy is cost-free and environmental-friendly in almost all countries of the world. With the increase in demand of electricity, the world is now bending to bring in use renewable energy systems to overcome the shortage of electrical power. The main disadvantage of the photovoltaic (PV) solar system is its lack of performance. Performance and life span of the Photovoltaic module is affected due to rise in temperature. There are so many other factors which affect the performance of the PV system such as shading, wire & inverter losses etc. Now-a-days, the efficiency of a solar panel is not more than 22 percent. It means that a whole system only convert 22% of sun light into electrical energy. This paper analyzed the performance of the PV solar system. We utilize a PV solar system consisting of two arrays of polycrystalline panels inclined at angle of 22˚. This experimental study focuses on various environmental factors and losses like temperature, shading and inverter losses etc. on PV solar system. We present various results on the basis of available data from the metrological department of Pakistan and measurement campaign. |
| **Paper ID: IEEC-2020-07** |
| **Design and Prototype Development of Vehicle Safety Alarm System Using Digital Microchips for Both Seat Belts and Doors**  **Waqas Ali, Mohsin Jamil, Usman Ali, Haroon Farooq, Muhammad Arslan Yousaf and Samreen Arif**  University of Engineering & Technology Lahore  Motor vehicle accidents or crashes are one of the leading cause of deaths and injuries worldwide and the Pakistani share in the total death toll is extremely high which is about three million per year. One of the main reasons behind this the majority of the automobiles used in the country are lack of safety features and warning system and those who have, do not meet the safety standards. The seat belts and doors safety and their warning systems are an important part of vehicle and research has shown that these safety systems reduce the chances of accidents and decrease the possibilities of fatal injuries. But unfortunately, in Pakistan, some automakers do not provide the safety features including warning systems in their automobiles in order to lessen the price of the vehicle and few that incorporate safety systems in their vehicles, have many limitations. Therefore, the aim of this project is to propose a simple and low-cost design of vehicle safety warning system for both seat belts and doors by using digital microchips. The proposed design is more intelligent than the earlier or that are currently in vehicle’s used in Pakistan as it warns and exactly displays which seat belt/belts and door/ doors is/are not buckled up and correctly closed respectively. |
| **Paper ID: IEEC-2020-08** |
| **Miniaturized Dual Band RFID Tag Antenna Mountable On Metallic Surface**  **Sundas Farooq Khan, Sara Bibi and Yasar Amin**  A miniaturized RFID tag antenna mountable on a metallic surface is proposed which can accommodate dual bands (865-868 MHz, and 899-902MHz) with read range 9.47 m. The antenna has a miniaturized structure achieved by meandering, spiral structure and adjusting the distance between feeding lines. The size of the antenna is 20mm (width) x 30mm (length) x 1.524mm (height). |
| **Paper ID: IEEC-2020-10** |
| **Classification of Pakistani Currency Based On Scale Conjugate Gradient (SCG) And Convolutional Neural Network**  **Bushra Aijaz, Faizan Aadil, Zahida Parveen1 and Muhammad Umair Arif**  Bahria University Karachi  Human interactions and manpower is being reduced with the machine automation in every field of technology. Automatic financial services have increased the requirement of automatic currency recognition that have eventually made automatic banking process, a major activity around the world. The paper recognition process is prone to pollution and depreciation of paper currencies due to frequent transactions and cause error during feature extraction. This paper proposes an efficient technique to recognize paper currency for Pakistani currencies. Pakistani currencies differ in color, size and texture and are classified into 7 classes as per the currency values. For feature extraction we have used bounding box technique for length and width extraction and Speed Up Robust Features (SURF) Extractor to extract local point in the images. The currency classifications are done using Scale Conjugate Gradient (SCG) Backpropagation, MobileNets and Inception V3 models and their outcomes are discussed. |
| **Paper ID: IEEC-2020-11** |
| **ANALYSIS OF HYBRID ENERGY SYSTEM FOR RURAL AREAS:A CASE STUDY OF VILLAGE SHAFIABAD DISTRICT SANGHAR SINDH, PAKISTAN**  **Suhail Ahmed Shaikh, Nayyar Hussain Mirjat,, Khanji Harijan ,Shoaib Ahmed Khatri**  Mehran University of Engineering & Technology Jamshoro Sindh Pakistan  Off-grid renewable energy hybrid systems including solar and wind are the potential solution to replace fossil fuel resources reducing the environment pollution and overcome the consumption of the power. In this study different hybrid configurations including solar and wind for rural areas of Shafiabad of district Sanghar have been analyzed by using the HOMER software. The renewable energy sources are considered PV and Wind Energy to meet the demand of the Shafiabad district Sanghar. In this study different optimization parameters are considered such as Cost of Electricity (COE),Net present cost (NPC).The result of this study off -grid PV hybrid system are the optimal configurations for the practical aspects to meet the peak demand of 4.4MW.The COE from the PV system is Rs 16.43/kWh. 100% of total kWh production is generated from the which 81.6 kW solar and 100kW of wind and 34.4kW of convertor were optimized for this case study with the total net present cost of Rs 29.4M and the initial capital investment of Rs 17.0M. The sensitivity analysis of the results provides an elaborated understanding of the effect of sensitivity variables on a feasible system configuration. These results suggest that hybrid system is more reliable and useful to overcome the energy crisis for the future work. |
| **Paper ID: IEEC-2020-12** |
| **Design and Analysis of Controller for Non Isolated High Gain DC-DC converter**  **Saad Ahmad , Abasin Ulasyar , Haris Sheh Zad, Abraiz Khattak , Kashif Imran**  NUST Islamabad Pakistan  This paper discusses the control of Non Isolated High Gain (NIHG) DC-DC Converter through a PID Controller. Traditional DC-DC converters cannot give high voltage gain because of efficiency drop on high duty ratios. To overcome this, NIHG converters have been developed which shows good efficiency on high voltage gains. In this paper NIHG Converter is controlled through a PID controller in a closed loop system. State space equations for the converter has been developed and the equations are used to determine the controller parameters. The NIHG Converter is implemented in Simulink and the performance is observed for load variations, input voltage variations and change in reference voltage. |
| **Paper ID: IEEC-2020-14** |
| **Reactive Power Compensation in the Vicinity of Multiunit Nuclear Power Plant with P-V and Q-V Curves Analysis**  **Muhammad Umer, Naila Zareen, Abdul Ahad, Moaz Ahmad, Abdul Rehman Abbasi and Tauseef-ur-Rehman Khan**  Karachi Institute of Power Engineering (KINPOE) Karachi  Inadequate reactive power support at the load side results in poor voltage profile at load end as well as line over loading, especially under peak load condition. Line overloading increases the probability of line loss contingency. Over frequency surge is observed at generators of base load nuclear power plants in case of line loss contingency due to failure in successful dispersal of generated power. That results in tripping of generators and subsequent tripping of reactors. These problems can be addressed by installation of SVCs (Static VAR Compensators) at load end as a source of reactive power and simulated in ETAP. P-V and Q-V curve analysis is used for voltage stability assessment of system and determine required reactive power compensation. Reactive power from SVCs will improve voltage profiles of load buses as well as reduce line flows. That reduces the probability of line loss due to over loading conditions |
| **Paper ID: IEEC-2020-17** |
| **Transients Fault Analysis using nonlinear state space model of Synchronous Generator**  **Muhammad Suleman, Sajjad Haider Zaidi, Nauman Memon, Bilal Muhammad Khan**  NUST Islamabad Pakistan  The focus of this paper is based on the designing of synchronous generator health monitoring. The third order state space nonlinear model of synchronous generator is designed in MATLAB and faults were discussed. The state space modeling of the system is obtained and then system is applied on the synchronous Generator. Different types of faults were observed by applying disturbances to the system and they are compared to the actual system. Nature of faults currents determine the type of faults. The faults currents analysis give us the details about the health of generator. Further, the health is predicted with the help of transients in the system. This system works well for diagnosing the faults of synchronous generator |
| **Paper ID: IEEC-2020-18** |
| **Carried Baggage Detection and Classification using Joint Scale LBP**  **Shahbano, Wakeel Ahmad, S. M. Adnan Shah and Madiha Ashfaq**  UET Taxila Punjab Pakistan  As crime rate has been increased in the 21st century, the automatic video surveillance system has gained significant importance in computer vision community. The crucial objective of surveillance is monitoring and security in public places and the system that are used for surveillance entail more intellect and more robust technical directives. This research proposed a detection and classification framework of baggage, that can be achieved by analyzing the human in different postures while carrying bag and it deals with various texture patterns of baggage. The descriptor like SHOG and JLBP is displayed to extract features of different human body parts including head, trunk, and limbs. Then support vector machine (SVM) classifier is used to further train the features. The proposed approach has been widely assessed by using public datasets like INRIA, ILIDS and MSMT. The experimental results have discovered that the system is satisfactorily accurate and faster as compared to the other well-known approaches. |
| **Paper ID: IEEC-2020-20** |
| **Automatic License Plate Detection**  **Muhammad Zohaib Sohail and Muhammad Hassan Shah**  NUST Karachi Pakistan  Automatic License plate recognition is an important phase in the recognition of vehicle’s license plate for intelligent transport systems. In this paper a technique and method for license plate recognition is presented. The proposed algorithm consists of several stages. In the first stage, we extract vertical edges of the input image using Sobel mask. In the next stage, histogram analysis is used for finding the candidate regions of license plate. Candidate regions are also verified by defined compact factor. In the last stage, we locate the license plate exactly with some morphological operators. Experiments have been conducted for validation of this algorithm. |
| **Paper ID: IEEC-2020-22** |
| **Exploring CO2 emissions and Economic growth in Pakistan**  **Tahir Ayaz Memon, Zubair Ahmed Memon, Syed Feroz Ali Shah, Faheemullah shaikh, Munwar Ayaz Memon**  Mehran University of Engineering & Technology Jamshoro Sindh Pakistan  Energy coupled CO2 emissions in Pakistan are major sources to global warming. To mitigate the CO2 emissions in Pakistan, it is important to investigate the elements that affects the carbon dioxide emissions changes. The aim of this paper is to analyze the energy coupled carbon dioxide emissions to decrease the emissions and conduct the decoupling, energy coupled CO2 emissions, economic development and recommend the policies for reducing the energy coupled CO2 emissions in Pakistan over the period 1990-2016. The decomposition technique used to examine the four factors: CO2 emissions intensity (CO2I), energy intensity (ECI), structural changes (ES) and economic activity (G) using log mean divisia index (LMDI) method, which is divided into three economic sectors: industrial, services and agriculture sectors. The results show that the economic development is the main contributor towards increasing the CO2 emissions in all three sectors of economy in Pakistan. Whereas as per trend analysis of decoupling, it indicated that for most of years shows the different values of decoupling index and that values shows the different type of coupling and decoupling types. |
| **Paper ID: IEEC-2020-29** |
| **Harmonic Reduction Technique in Presence of Large Number of Non-Linear Lighting Loads**  **Alina Naz, Muhammad Mohsin Aman, Hira Yamin, Nimra Mustafa**  NED University of Engineering & Technology Karachi  This paper presents an effective method to reduce harmonic distortions in the system due to large number of non-linear lighting loads. They consume less energy with higher efficacy as compared to incandescent lamps but consume large amount of harmonic currents due to the presence of non-linear electronic ballast, producing distortion in current and voltage waves of the system and resulting in lower power factor. Therefore, the widespread use of non-linear lighting lamps is a disaster for power companies as poor power quality adversely affects the consumer appliances, making it necessary to reduce the harmonics produced for better performance. Several experiments were conducted by using various combinations of CFLs and LEDs, available by different manufacturers in the local market. Through harmonic analysis, the total %THDi and k-factor were noted for each case. This paper shows through experimental results that filter circuits present in one lamp, filter the harmonics due to other nonlinear loads, decreasing the %THDi of the system. |
| **Paper ID: IEEC-2020-30** |
| **Fined-Grained Classification of Vehicle By Using Inception-V3**  **Danish Ul Khairi, Yumnah Hasan, Zahida Perveen, Marium Ata and Mohammd Umair Arif**  Bahria University Karachi  Traffic surveillance plays a significant role in reducing congestion, road planning and identification of suspicious vehicles. For this purpose, different detection and classification techniques are studied by researcher to improve the accuracy in real time and different climatic scenarios. In this paper, inception V3 model based on Deep Neural Networks (DNN) is used for the two standard datasets which include Stanford and BMW-10. Total 16, 185 and 564 images are assessed during the process for Stanford and BMW-10 respectively. The preprocessed images (zoom, cropped and grey scale) are utilized. The learning, training, validation parameters are changed to increase the accuracy. The highest true classification is obtained with zoom images at learning rate 0.5, validation 10% and testing 20% is 62.2% for Stanford dataset. Whereas, for BMW-10 dataset 82.7% accuracy is obtained from at learning rate 0.1, validation 10% and testing 20% with cropped at zoomed images. |
| **Paper ID: IEEC-2020-32** |
| **Device-to-Device Communication Prototyping using Software Defined Radios**  **Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed and Hira Mariam**  NED University of Engineering & Technology  This paper summarizes our efforts in developing a testbed for device-to-device (D2D) communication. In this paper, we have discussed the need and importance of establishing D2D communication based prototyping testbeds. We have also provided a review of various testbeds developed globally targeting experimentation in D2D communication in LTE-Advanced and 5G networks. We have also discussed the set up and working of the D2D prototyping testbed established in our lab using software defined radios (SDRs), the first of its kind in Pakistan. Lastly, we demonstrate the preliminary functioning of SDR-based testbed using LabVIEW Communications and the Universal Software Radio Peripheral (USRP) hardware platform. |
| **Paper ID: IEEC-2020-38** |
| **Case Study for Solar Cooling System using Hybrid Multijunction PV and CST Technology**  **Muhammad Shahram, Tariq Javid**  Hamdard University Karachi  Presently, the solar energy is a promising solution among existing renewable energy resources. The energy still needs an adequate amount of change by improve the efficiency of either photo voltaic (PV) or concentrated solar thermal side (CST). This paper proposes a management enhancement for both PV and CST for the solar cooling system. The study is based on the existing infrastructure on which data monitoring and analysis is performed. The PV system provide 35kw of power to drive electrical chiller during day time while the concentrated solar provide 35kw energy to drive absorption chiller during the night time. The multijunction solar cell concept is used to improve the efficiency of the solar panel. The GaInP/GaAs/Ge material  is used in multijunction solar cell for better utilization of solar spectrum as these material have wider band gap. Sand is use as a heat storage material in concentrated solar side to raise the temperature up to 1000 degree centigrade. The purposed solution working day and night during the day time PV drive the electrical chiller to fulfill the requirement while CST storage heat in a large storage tank use in night to drive the cooling system. The simulation managing both sources showed a significant energy fit to the cooling load reaching a peak during the summer days. The output result shows that the proposed solution Environment Friendly, Economical and Working day and Night. |
| **Paper ID: IEEC-2020-44** |
| **An Empirical Study of Face Recognition for Occluded and Low-Resolution Images**  **M. Ibrahim Syed, Mehreen Mubashar M.Waqas Zeb**  COMSATS University Islamabad, Abbottabad  Human faces that appear in multimedia applications, for instance digital entertainments are exposed to substantial variations in pose, face image resolutions, and occlusions. Recent research also targets to achieve reliable and robust face recognition under aforementioned issues. This paper presents an experiential study of three recently developed face recognition methods on challenging LFW dataset. Our simulations indicate that for 15×15 pixels and up to 256×256 pixels face image, the local binary pattern histogram-based face recognition algorithm, which is integrated with haar-cascade classifiers yields the highest recognition accuracy across frontal (00), ±350, and +450 of pose variations. In addition, for three different occlusions, the aforementioned algorithm also surpasses the compared algorithms in terms of recognition accuracy. The weighted kernel sparse representation-based recognition algorithm was observed to be near real-time. The context aware local binary feature learning-based algorithm was found to be most computational expensive among the compared algorithms. |
| **Paper ID: IEEC-2020-45** |
| **A Comparative Study of CNN Based Vehicle License Plate Recognition Algorithms**  **Waqar Ahmad, Zainab Shah and Nazeer Muhammad**  COMSATS University Islamabad, Abbottabad  License Plate Recognition (LPR) is attracting huge interest in recent years for its active role in smart traffic management systems. Owing to its authenticity, several LPR algorithms have been developed, which consist of license plate location, character segmentation, and character recognition. In most cases the aforedescribed three-step scheme yields satisfactory recognition performance in controlled environment. To address the uncontrolled challenge, we present a comparative study of two recently developed LPR algorithms, which are (a) CNN-RNN and (b) CNN-GRU based license plate recognition algorithms. Extensive simulations on the PKU dataset indicate that for high license plate image resolution of 80×40 pixels and above and low license plate resolution of 50×30 pixels and below, the CNN-RNN based LPR algorithms outperforms its companion algorithm in terms of recognition accuracy on all five categories of PKU dataset. While, CNN-GRU license plate recognition algorithm is computationally efficient. In addition, none of the algorithms achieve recognition on low license plate resolution of 15×15 pixels. |
| **Paper ID: IEEC-2020-47** |
| **Heliostat Field Layout: An Overview of Modern Trends in Generation, Optimization and Control Strategies**  **Muhammad Haris and Syed Owais Athar**   |  | | --- | | Baluchistan University of Information Technology, Engineering & Management Sciences, Quetta, Pakistan |   As the configuration of the current energy mix of Pakistan hangs in the balance for not being more responsive to power fluctuations and peak demand. The government and researchers continue to find out ways that define sustainability, cost-effectiveness, and efficiency. Recent developments in concentrating solar thermal power, especially, solar power tower technologies are being made at a faster pace. Two of the most important aspects that define the performance of such plants are Heliostat field layout and the control strategies deployed for solar tracking. A comprehensive review of various strategies active to generate and optimize the field layout is presented. Along with that, the methods used to track the sun for increased power input to the receiver are also reflected in the paper. Finally, the best available solution in methods for generation, optimization, and control are presented in comparison to their counterparts. |
| **Paper ID: IEEC-2020-57** |
| **Evaluating the role of motion planning and steering control modules of Autonomous Vehicles in the perspective of single and mix traffic Scenarios: A survey**  **Marya Rasib1, Saba Malik, Faisal Raiz, Iram Javed, M. Atif Butt, Samia Abid, Kamran Hameed**  Mirpur University of Science and Technology (MUST), Mirpur AJ Kashmir  Motion planning is the process of finding a collision-free path from source state to destination position. Path planning and path tracking are two important fundamentals of autonomous vehicles and a variety of techniques have been mentioned broadly inside the literature for both fundamentals. In this paper, we present a review of crucial strategies of path planning techniques and steering control path tracking techniques of autonomous vehicles (AVs) and attempt to intricate their use in a one-of-a-kind scenario. Our contribution leads to accelerates different aspects of motion planning in an efficient manner. The review includes main algorithms in motion planning and path tracking controllers presented in the form of taxonomy, their features, and their applications to driving, along with key challenges. This study shows that while advanced control methods improve tracking performance, in most cases the results are valid only within well-regulated conditions. In the end, some open problems related to the possible role of motion planning and steering control have been presented as well |
| **Paper ID: IEEC-2020-63** |
| **Design and Simulation of Energy Efficient Campus**  **Anam Shah, Nayyar Hussain Mirjat, Suhail Ahmed Shaikh**  Mehran University of Engineering & Technology Jamshoro Sindh Pakistan  Pakistan as a third world country has failed to cope with energy shortage and as a result country is facing huge economic crisis. Energy shortage has affected all the fields of life due to increase in Electricity demand and consumption. Moreover, rapid growth in population and increased use of electronic appliances has contributed to increase in cost of electricity and CO2 emissions. To solve the rising environmental and economic problems, it is crucial to optimize energy consumption by putting into place energy efficient measures. Our idea is to investigate the current wastage and propose simulation-based energy consumption model. In our work, we studied the currently deployed power consumption model based on real time power measurement data. The electric load data was fed to Homer simulation tool to create a fine load curve. Homer based simulation model was built to obtain the optimized energy consumption behavior. The simulation model used the off-grid PV. Further, we obtained cost of electricity and net present cost of system. As a result, ecofriendly system was developed with lower carbon emissions |
| **Paper ID: IEEC-2020-64** |
| **Impacts of Coal investments under CPEC on National Economy of Pakistan: An Input-Output Analysis**  **Sumia Khatyan, Faheemullah Sheikh, Nayyar Hussain, Suhail Ahmed Shaikh**  Mehran University of Engineering & Technology Jamshoro Sindh Pakistan  Coal is the most important energy resource. Coal is important to Pakistan's economy, providing cheap electricity throughout our economy to households, enterprises, manufacturing facilities, transportation and communications systems, and utilities. It is crucial to promote the microeconomic growth of Pakistan's national economy. The INPUT-OUTPUT framework is used in this analysis to calculate the overall effect of CPEC coal investment in the economy of Pakistan. The overall economic impact coefficients are 2.437 on production, considering in which every component of total FD change in the investment of coal. The overall economic impact coefficients of Gross Domestic Product (GDP) were 3.0979, despite every component of FD change in the water sector for electricity gas. The direct and indirect effects on the overall CPEC coal project production is 2.44 and the sector's induced impact is 6.803E-07. Higher direct impacts were reported on some of those industries which consume electrical and mechanical energy directly, indirectly. In the future, the effects of coal investment on Pakistan's national economy may increase as the energy crisis decreases. |
| **Paper ID: IEEC-2020-01** |
| **Fault current analysis and its effects comparison on HVDC and HVAC of 660kV Matiari to Lahore project (Pakistan)**  **Muhammad Usman, Javed Muhammad Ali, Safdar Raza**  Nfc,IET,Multan,Pakistan  Fault current is the flow of abnormal current in transmission system. It occurs in three states i) Sub-transient state ii) Transient state iii) Steady-state. They have an impact on power loss and power system physical parameters. This paper describes a special case of HVDC transmission simulated in ETAP installed at 660kV and performs fault current analysis of HVDC and HVAC. The results show that HVDC gives less value of fault current in case of longer transmission lines. |
| **Paper ID: IEEC-2020-06** |
| **Design and Control of Automatic Elevator Using Arduino**  **M.Faizan Khan, Shafique Ahmed Soomro, Syed Abid Ali Shah , Muhammad Faisal, Munam Khalil and Mahesh kumar**  **Indus University Karachi, Pakistan**  The sudden transportation from rural to urban sites has created immense growth in population. This situation has created the congestion issue in residence and there is an essential need for vertical high buildings. As the development in building construction is getting fast with more story level which creates the need for a machine that operates with the latest power controller scheme to save time. This paper purposes the developed model for monitoring and controlling of elevator system to maintain autonomy. The methodology used to calculate the system parameters for designing an elevator with an Arduino controller. The system connected with designed Ethernet card that is assembled with hypertext machine language. This card design to solve client problems and clients easily monitoring and control the system in order to monitor the elevator, the card is installed in the design system. The card connection also comprises of sensor module. Secondly, the control of the elevator is attained by a designed graphical user interface system that acknowledges the proper maintenance of the prototype. To validate the effectiveness of the proposed method, the system is analyzed with simulation and hardware assembly. The overall results verify that the Arduino is suitable to monitor the prototype with the help of the webpage through the Ethernet shield |
| **Paper ID: IEEC-2020-13** |
| **Data Acquisition System & Real Time Monitoring of the Parameters of Induction Motor via Wireless Communication**  **Maqsood Ali and Shariq Shaikh**  **NED University of Engineering & Technology Karachi**  The aim of this paper is to provide methods and techniques used for wireless monitoring of the parameters of a widely-used induction motor through interfacing of Arduino UNO (for wired communication) and Node Micro Controller Unit (NodeMCU) Wi-Fi module (for wireless communication) with MATLAB (Matrix Laboratory) software. The parameters which can be monitored through the techniques discussed in this paper are current waveform, voltage waveform, temperature (Celsius), rms value of voltage and current, peak to peak values of current and voltage, power factor, magnitude spectrum of induction motor. Technique of carrying out Motor Current Signature Analysis (MCSA) has also been discussed in this paper for health monitoring of the motor. |
| **Paper ID: IEEC-2020-15** |
| **IoT Based Monitoring for Work efficiency Calculation of a Metal Fabrication Plant**  **Durr E Shehwar, Dr. Syed Sajjad Haider Zaidi and Dr. Bilal Khan**  National University of Sciences and Technology, Karachi  Process improvement and optimization is the prime goal of every industry. If an enterprise is not continuously improving the way it performs, it will likely fall behind in the market. Succeeding in today’s business environment means consistently adopting ways to do things better. With tools for process enhancement, companies can evaluate performance standards and optimize processes without hindering existing team procedures. Descriptive reports and analytics provide insights into delivery trends to remove obstructions, predict future issues, and take proactive decisions to adapt workflow processes for improved productivity. This paper discusses a comprehensive solution around this problem by modeling a system which can monitor the Overall Equipment Effectiveness (OEE) in real-time using the state-of-the-art technology of Internet of Things (IoT) and cloud computing so that any undesired operation can be diagnosed well before time. This will be achieved by the utilization of real-time data and its prognosis using OEE calculation techniques. Overall Equipment Effectiveness is the critical metric to monitor the actual performance of a tool relative to its performance capabilities under optimal manufacturing conditions. By controlling the system's expected future performance along with pinpointing the exact underlying problem and rectifying it so that abrupt shutdowns are avoided and productivity is not compromised. |
| **Paper ID: IEEC-2020-23** |
| **Image Processing Based Detecting & Tracking for Security System**  **Atiq Ur Rehman, Naeem Shehzad and Naqeeb Ullah**  Department of Electronic Engineering BUITEMS, Quetta, Pakistan  Department of Electrical Engineering, COMSATS Lahore, Pakistan  Security systems are getting more attention and importance. Various security systems based on sensors and wireless communication is available for human force, machinery or electronic applications. These traditional systems have some drawbacks like it has no capability to examine the suspect. And it is very difficult to expand the traditional security system by adding several sensors because of the complexity of the algorithm of the system. Hence, viewing the former points, this paper proposes the method of image processing to design a security system consisting of detection, tracking, via wireless communication and generating an alarm. The Optical Flow technique of image processing is used to detect using motion analysis of two consecutive frames from the imaging source. The block analysis determines the tracking capabilities of the system by the property of Good Features to track. The wireless link between the imaging sources is established through XAMPP. While the functionality of the alarm is performed at the commencement of the detection process. The obtained results are encouraging and increasing the efficiency of the security system. |
| **Paper ID: IEEC-2020-35** |
| **Implementation of Policy Based Routing on MikroTik**  **Ayub Laghari, Nafeesa Bohra, Abdul Latif Memon, Abdul Bassit Surahio**  Mehran University of Engineering & Technology Jamshoro Sindh Pakistan  In this paper proper bandwidth utilization is predicted using policy making decisions by using MikroTik router. Future network demands, high bandwidth as number of devices are increasing day by day and to ensure this suitable network mechanism is needed with the help of policy making scenario. Implementing policies in firewall refrain the unauthorized access and bandwidth is not being efficiently utilized. The results suggest that MikroTik router provides built-in firewall that is not only user-friendly in policy making but also provide Quality of Service and makes an efficient utilization of Bandwidth resources. Policy based routing facilitates proper network management. Through policy application, network bandwidth can be used appropriately, misuse of bandwidth can be prevented which in turn can enhance quality of service. |
| **Paper ID: IEEC-2020-37** |
| **Security, Privacy and Trust using Blockchain in Industrial Internet of Things (IIoT): A Review**  **Faizan Hussain, Dr. Adnan Ahmed Siddiqui, and Iqbal Uddin Khan**  Hamdard University Karachi, Sindh, Pakistan  With time there have been significant progressions that occurred under the umbrella of information technology. Internet of Things has been considered as one of the most active cultivation that had taken place and supports people in the provision of significant ease. In addition, with time the concept of the internet of things has also been improved which is depicted in its different generations. Internet of things played an essential role in several vicinities such as schools, medical, agriculture, and other areas; however, in industries, the concept of industrial internet of thing has also been stimulated. The term industrial Internet of things has been summarized with several development and activities that have been involved in the evolution of different processes and procedures of industries such as production, automation, logistics that had an impact on productivity. In addition, the concept of industrial Internet of things could also be improved with the help of Blockchain. Therefore, with regards to security, privacy, and trust in accordance with Blockchain has been delineated in this paper comprehensively that help the readers in the development of relevant knowledge and information concerning security, privacy and trust using blockchain in the industrial internet of things. |
| **Paper ID: IEEC-2020-40** |
| **A Comprehensive Study: 5G Wireless Networks and Emerging Technologies**  **Sadiq Ur Rehman Afzal Hussain and Faizan Hussain**  Hamdard University Karachi, Sindh, Pakistan  Fifth generation networks are the area in which a lot of researchers are spending their time to enhance its performance as per dynamic change in wireless communication. The essential utilization of such a technique (5G) is used to have higher data rates containing minimum latency. The data rate of 5G technology is usually gigabits per second (Gbps). With respect to other technologies like 3G, 4G, LTE, and other networks, 5G networks provide better capacity for the base station along with above the average Quality of Service (QoS). With the advancement in technology and rise in the usages and demand of multimedia data, 5G networks are the most suitable option to achieve the best QoS, improved capacity and overcoming the latest issue of cellular networks. Since many base stations and devices are in connection with each other in 5G. |
| **Paper ID: IEEC-2020-56** |
| **Analysis of components and circuit for FMCW Radar System**  **Saqib Ahmed, Fahim Aziz Umrani**  MUET Jamshoro Sindh Pakistan  In this paper, the components required for FMCW Radar system operating at 3 GHz i.e., modulator circuit and video amplifier are designed and tested. For this purpose, the components were selected from microstrip trainer kit MST-523 of Feedback Instruments. The working of each component is analyzed through VNA and spectrum analyzer. The patch antennas provided in the kit were used as transmitter and receiver operating at 3 GHz. The modulator circuit was built with variable frequency and amplitude to modulate the signal from VCO. The triangular wave was selected for this purpose to modulate the VCO. The received signal was measured on spectrum analyzer and received power was measured at every integral multiple of wavelength to check working state of antenna and change in power. The Low pass filter circuit was also design to filter out the higher frequencies after the mixer stage. The radar range is calculated based on measurement of system. |
| **Paper ID: IEEC-2020-59** |
| **Towards Novel biological inspired Collision avoidance scheme for Internet of Things (IoT) enabled self-driving cars in controlled environment: A concept Paper**  **Zuhaib Ahmed Khan, Mubeen Rafaqat, Shabab Tariq and Faisal Riaz**  Mirpur University of Science and Technology (MUST), Mirpur, AJK Pakistan  Self-driving cars are considered as the best solution to avoid collision between vehicles. However, this collision avoidance capability can be increased if we use Internet-of-Things (IoT) based smart roads. IoT is a combination of different computing as well as mechanical devices. The use of IoT is a growing technology and its use in self-driving cars is not explored at large. This research paper is a concept paper presenting the latest efforts in the Control, Automotive and Robotics lab, NCRA to implement first IoT enable smart controlled environment to help AVs to avoid collisions more efficiently. In this regard concept of four novel schemes has been proposed in this paper along with their diagrams and pseudo codes. We have explored biological aspects in this regard. Our proposed models are Chameleon-inspired, Bat-inspired, and human Tactile-based collision avoidance schemes which further incorporate IoT concepts to envisage the next generation self-driving cars. |
| **Paper ID: IEEC-2020-62** |
| **Solar Power: A Way Out of Energy Crisis of Pakistan**  **Muhammad Hassaan Qadeer, Urooj Fatima, Misbah Kashif, Syed Umaid Ahmed4 and Riaz Uddin**  NED University of Engineering & Technology Karachi Sindh Pakistan    Pakistan is facing a significant supply-demand gap due to limited energy production, resulting in power cuts that are blamed for the country's instability. For years, this has been a major hurdle in the country’s economic growth. The country with a short-fall of about 6000 MW hasto opt for load-shedding in order to fulfill the demands. This load-shedding occurs mostly for uncertain period which disturbs the life cycle of many citizens. This article discusses the energy scenario of Pakistan with facts and figures leading to the load-shedding issue. Moreover, it proposes solution to energy crisis of the country by aiming to the sustainable alternative in terms of renewable energy. Pakistan is enjoying a higher rank among countries with great potential of solar irradiance can explore this resource not only to fulfill its demands but also to play a part in cleaning the environment of the world. With proper infrastructure and policies, Pakistan can utilize this potential to achieve a better solution to its energy crisis as well as to its economic conditions. |