



ABSTRACT BOOK

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1. Energy Monitoring of Household Appliances with Data Acquisition in A Power System

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Abstract— Most of us take power for granted wherever we live in the world power touches all our lives. Poor power quality is a growing concern and often unseen. It generates higher electricity bills leads to higher running costs in factories and offices causes appliances to malfunction. He drains our planet's precious resources. Whether we work in an electrical utility or an industrial facility understanding the health of our power quality is critical. There can be many causes of poor power quality like low power factor, harmonic pollution, load imbalances or fast voltage variations. Therefore, real-time monitoring of power quality parameters is of great significance because it provides accurate and reliable data for analysis, system planning and demand management. This paper bestows the virtual power quality (PQ) analyser integrated with LabVIEW and a laptop/PC having remarkable data acquisition system (DAQ). Power quality parameters like root mean square (RMS) voltage and current, total harmonic distortion (THD) of current and voltage, frequency, real power, reactive power, apparent power and power factor are presented in this paper.

2. Load Flow Analysis of a 132 kV Industrial Area Grid Station under Peak Load

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Abstract—This paper presents the load flow analysis of Islamabad Electric Supply Company (IESCO) 132 kV grid station which is installed to provide continuous supply of quality power to Islamabad industrial area. The purpose is to analyse grid stability, identify problem areas in electric power transmission and suggest measures for improvement in the light of analysis. The original name plate values of grid components including Power Transformers, Circuit Breakers, Current Transformers, Potential Transformers, Isolators, Overhead incoming lines and Outgoing cables were used for analysis. The real-time peak values of load currents, power factor recorded in extreme hot season of year 2016 were taken for study. Simulation was performed in Electrical Transient Analyzer Program (ETAP) which is one of the advanced tools used for load flow studies. Overall grid performance under peak load was found adequate with respect to the laid down parameters except that under-voltage was observed along with few overloaded lines. Keeping in view the load shifting in case of fault, replacement of the oldest commissioned transformer and a circuit breaker is recommended.

3. Techno-economio-environmental viability assessment of Grid-Connected photovoltaic system- A case for different cities of Pakistan

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Abstract—With the increased demand of electricity and depletion of conventional energy sources reserves, lately researchers are recommending the use of standalone and grid connected photovoltaic (PV) systems. Pakistan has ~2.9 million MW potential of electricity generation through solar PV applications which is hardly exploited. This work is focused on analyzing the technical, economic, and environmental aspects of a standalone photovoltaic system installed in five different cities of Pakistan (Faisalabad, Sakkar, Bhakkar, Gawadar and Abbotabad). Simulations are carried out on “RETScreen” for 1 kW system capacity. The weather data used in simulation is reported by the National Aeronautics and Space Administration (NASA). Technical analysis is performed in terms of capacity factor and electricity delivered to load. Designed system’s economics is analyzed considering economic parameters i.e., net present value, internal rate of return, payback period, benefit-cost ratio and annual life cycle savings. Outcomes elaborate that Abbottabad is the most feasible location among selected locations with 4.1 years payback period, while Bhakkar and Gwadar are the least feasible with 4.6 years payback period. GHG emissions possible to get reduced are estimated for pointing out the feasibility of solar PV technology implementation leading towards green growth of Pakistan

4. Load Management Techniques and Challenges for Smart Power Grid: A Survey

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Abstract: Energy demand is increasing day by day and smart grid is one of the promising solutions to deal with the situation by integrating CO₂ free renewable sources with the existing system. Load management techniques are employed by utilities and consumers to meet their load demand in peak times, to reduce their energy cost by lowering maximum demand, and to use their energy resources effectively. Bi-directional communication feature of smart grid is facilitative in load management as loads can be remotely controlled in different scenarios. This paper comprehensively describes various techniques of load management and highlights various challenges in their adoption. It also discusses different methods to improve the performance of existing techniques and give directions for further research in the said area.

5. Centroid based tracking of a moving light source

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Abstract— Exploiting machine vision techniques, a two degree-of-freedom tracking system for a visible moving light source is designed and implemented. A digital webcam is used as a visionary sensor to take images of a visible moving light source. Image processing regarding enhancement of captured images and detection of light source is performed in MATLAB programming environment. Depending on the new position of the light source on the captured frame, the coordinates of light source are obtained and sent towards micro-controller through serial port of computer. According to this data, micro-controller activates two H-bridge circuits to activate two dc motors incorporated with pan-tilt mechanical structure to provide required movements to the webcam. The webcam tracks the light source in a way that the center of the webcam always stays aligned with the center of light source. A real time pan-tilt visual tracking system is developed as a test platform to investigate the performance of the system. Tracking of light source is done in left-right and up-down directions. Experimental results indicate satisfactory performance of the system

6. Fingerprint classification: A Machine Learning based approach

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Abstract— In this work, a machine learning based matching technique for fingerprints have been adapted to showcase the performance of the algorithm. Support vector machine has been used for the classification of fingerprints. Whereas, different statistical parameters have been calculated to depict the performance of the algorithm such as sensitivity, specificity, accuracy, etc. Intrinsic features of fingerprints such as orientation field and frequency are calculated by using least mean square algorithm and x-signatures, respectively. Gabor filter is applied to cope with the noise and poor quality images and enhanced images are produced. Minutiae points carrying well defined orientation are extracted and the classification based on support vector machine is performed using FVC2000 and FVC2002 fingerprint databases. Through experiments improved accuracy and equal error rates have been obtained.

7. Solar Water Heating System with Improved Efficiency and Thermal Analysis using TRNSYS

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Abstract—The objective of this paper is to develop and analyze a solar water heating system with flat plate solar collector using TRNSYS simulation and improving the efficiency of the system by parametric optimization. Pakistan has a great potential for renewable sources which still needs to be exploited in order to overcome the energy crisis faced by the country since many years. This model is developed for the weather conditions of Lahore, considering the abundant solar energy potential for the area which could be an alternative solution to fulfill the natural gas demands for water heating. The flat plate solar collector is used with a stratified water storage tank and auxiliary heating system. The efficiency of the system is calculated taking into account the input energy, feed water temperature and output useful energy obtained from the solar collector. The results for the winter and summer season are compared and the simulation results are integrated to find the total efficiency for the year which is 83.3%.

8. Landmines Detection with Drone*

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Abstract— This paper shows the ongoing project on the detection of landmines through an unmanned Ariel Vehicle. Detection of mines using Unmanned Ariel Vehicle is a modern conceptual prototype, in which a low pass flying drone has been designed to detect landmines which remotely control by base station. This Drone sustain a Metal Detector, and send spotted locations to our developed Computer Application via GPS. Base station is an important part of project as it is required to acquire the position of landmine that has been detected by our drone. It consists of an Graphical User Interface application installed on our computer which will be monitor by personnel in real time. Landmines have been a great threat to human life since world war II. A large number of casualties reported are mostly caused by landmines. Old methods of landmines detection are expensive, life risky and time-exhaustive. Our System for the detection is more efficient, secure and cost effective as it would not involve any human interaction during demining process.

9. Mathematical Model for Maximization of Power Generation of Photovoltaic Plants

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Abstract: Substantial amount of Mathematics is required to get electricity from renewable sources or fossil fuels power plants to light up switch. By using Matlab software a Geo-thermal system model has designed to check energy production with the help of fossil fuel projects and to minimize its delivery cost. The photovoltaic, electric energy production system is the most efficient and technically tested choice to optimize electric energy production. To avoid mismatch problems of Photovoltaic (PV) plants, re-configuration techniques of fixed series-parallel connection has been used. In this project Matlab-Simulink is used to design Mathematical model that allows the maximization of the generated power of Photovoltaic plants under equal radiation conditions. Finally, both the models are compared to check that which one is best to fulfil our requirements of energy production in reference of available economic condition.
