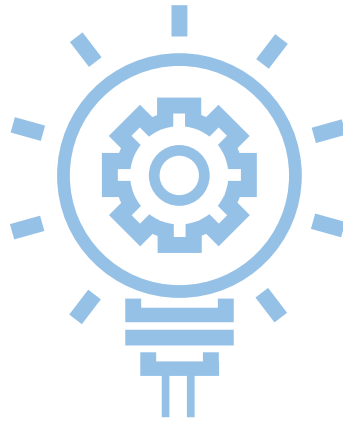# PROCEEDINGS

of

NATIONAL CONFERENCE ON RECENT ADVANCES IN ELECTRICAL & ELECTRONICS ENGINEERING (NCREEE '19)

on 27 April 2019

Organized by
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

In Association with
KSEBEA

IEEE PES
Power & Energy Society®

MAR BASELIOS CHRISTIAN
COLLEGE OF ENGINEERING & TECHNOLOGY
KUTTIKKANAM, PEERMADE

Conference Proceedings

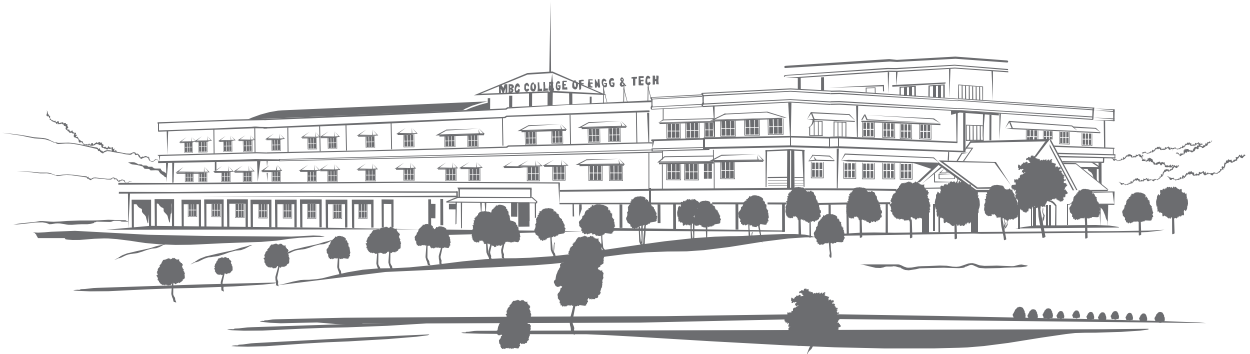## National Conference on Recent Advances in Electrical and Electronics Engineering (NCREEE '19)

Department of Electrical & Electronics Engineering
MBCCET, Kuttikkanam, Kerala, India

27 th April 2019

Editors

Prof. Robins Anto, MIEEE, MIE, MISTE
Prof. Lordson Devasia, MIEEE

ABOUT THE INSTITUTION

Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Peermade, established in 2001 is one of the first generation self-financing Engineering College affiliated to APJ Kerala Technological University and approved by All India Council for Technical Education (AICTE), New Delhi. The College is fully owned and managed by the Malankara Orthodox Syrian Church, which plays a paternal role in the institutions establishment and operations.

ABOUT THE DEPARTMENT

The Department of Electrical & Engineering aims to produce skilled and competent engineers who aim for greater heights. We are proud that the majority of our department graduates are employed in leading Electrical, Electronic, Communication, Computer, Power, Oil & Petrochemical and consulting industries in the Govt. and Private sectors. To improve the employability of the graduates, the department offers various add-on programmes in different thrust demanding areas and according to the employer requirements. The motto of the Department point towards the excellence in teaching learning process.
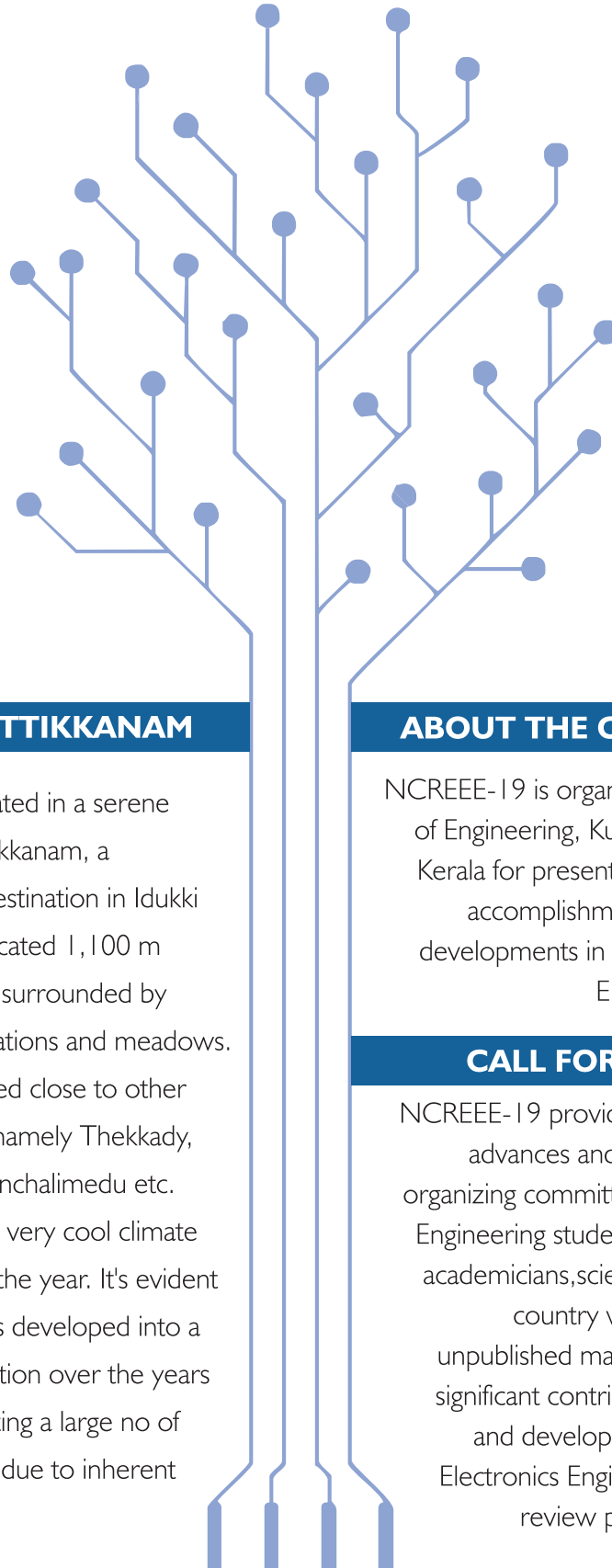
ABOUT KUTTIKKANAM

MBC College is located in a serene atmosphere of Kuttikkanam, a prominent tourist destination in Idukki district of Kerala, Located 1,100 m above sea level and surrounded by lush green tea plantations and meadows. Kuttikkanam is located close to other major tourist spots namely Thekkady, Vagamon, Idukki, Panchalimedu etc. Kuttikkanam offers a very cool climate to its visitors round the year. It's evident that Kuttikkanam has developed into a hub of higher education over the years and has been attracting a large no of students every year due to inherent climate and beauty.

ABOUT THE CONFERENCE

NCREEE-19 is organized by MBC College of Engineering, Kuttikkanam, Peermade, Kerala for presenting and sharing recent accomplishments and technological developments in the field of Electrical & Electronics Engineering.

CALL FOR PAPERS

NCREEE-19 provides a platform for new advances and research results. The organizing committee of NCREEE invites Engineering students, research scholars, academicians,scientists and industrialists country wide to submit original unpublished manuscripts that illustrate significant contribution to the research and developments in Electrical and Electronics Engineering. Un published review papers are also invited.

CONFERENCE TRACK

- ELECTRIC MACHINES & DRIVES
- POWER SEMICONDUCTOR DEVICES
- RENEWABLE ENERGY SOURCES
- FACTS, HVDC, POWER QUALITY
- AUTOMOTIVE ELECTRONICS

- CONTROL & INSTRUMENTATION
- ARTIFICIAL INTELLIGENCE
- BATTERY MODELLING
- POWER CONVERTERS & APPLICATIONS
- POWER ELECTRONICS DESIGN ISSUES

- SMART/ MICRO GRID
- ENERGY EFFICIENCY IN ELECTRICAL SYSTEMS
- HYBRID ELECTRIC VEHICLES
- MEDICAL ELECTRONICS
- IOT BASED APPLICATIONS

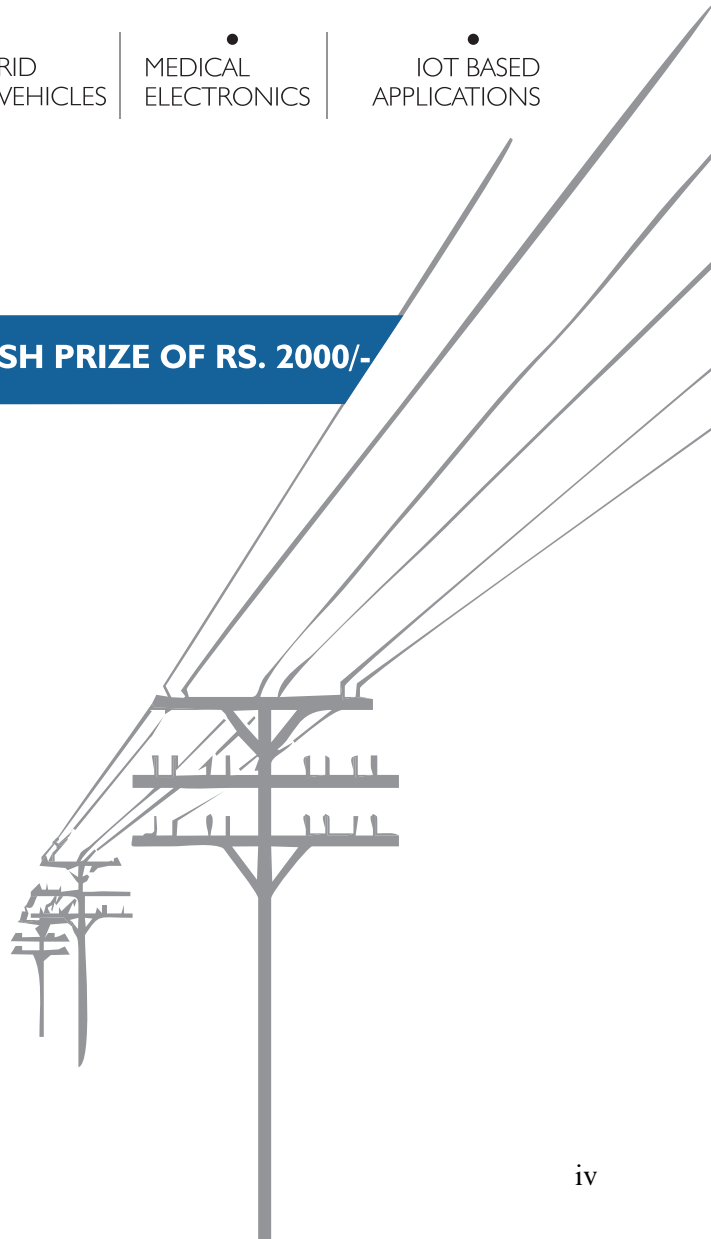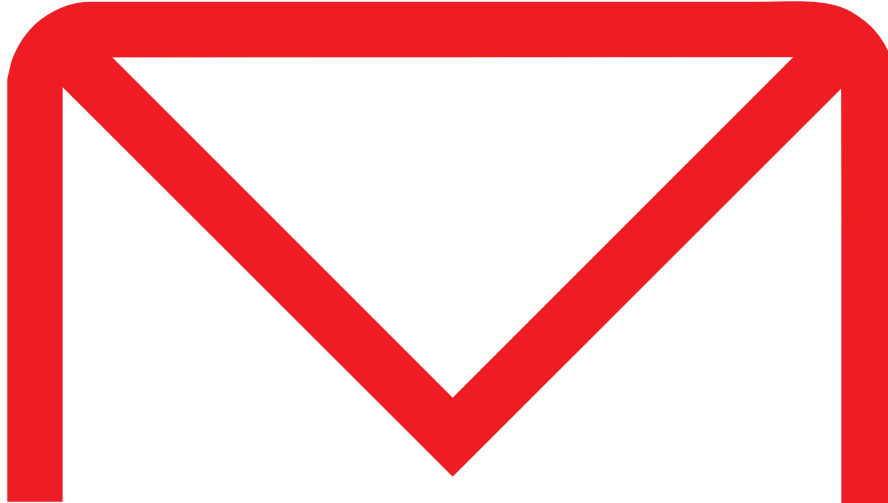## BEST PAPER AWARD WITH A CASH PRIZE OF RS. 2000/-

IMPORATANT DATES

Submission of the Abstract: 10.04.2019

Intimation of Acceptance: 18.04.2019

Full Paper Submission: 23.04.2019

Last date of Registration: 24.04.2019

AUTHOR GUIDELINES

Post your paper in IEEE format through Easychair in the following URL:

https://easychair.org/conferences/?conf=ncreee19

Or send to e-mail: **ncreee19@mbcpeermade.com**

All accepted and presented papers will be published in Scopus Indexed / UGC Listed Journals.

Journal of Emerging Technologies and Innovative Research - (ISSN No. 23495162, UGC No. 63975)

IETE Technical Review (SCOPUS indexed)

Indian Journal of Environmental Protection (SCOPUS indexed) *

For Registration,

please visit our website: **www.mbcpeermade.com**

CHIEF PATRON

His Holiness Baselios Marthoma Paulose II
The Catholicos of the East & Malankara Metropolitan,
The Supreme Head of the Malankara Orthodox Syrian Church

PATRON

V. Rev. Fr. C John Chirathilattu
Cor Episcopa, Convenor, Core Committee
Sri. Roy V. Vairamon, Director, MBC CET
Mr. Sajan George, Board Member

GENERAL CHAIRS

Mr. K. A. Abraham, Bursar
Fr. Kuruvila Perumal Chacko, Student Advisor
Dr. Nirmala Joseph, Dean Student Affairs, MBCCET

PROGRAMME CHAIRS

Dr. Pradeep C, Principal ,MBC CET
Dr. Anoop K J, Dean Academics, MBCCET

CONVENOR

Prof. Robins Anto
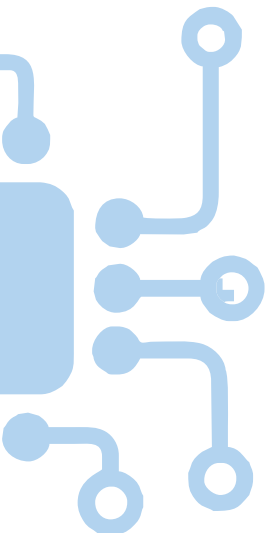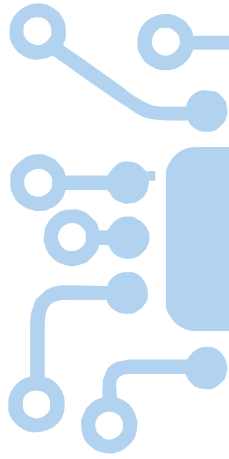Associate Professor & HoD, EEE Department

EVENT CHAIR

Prof. K. Kanchana
Associate Professor

CO-ORDINATORS

Prof. R Griesh, Asst. Professor
Prof. Sherin Samuel, Asst. Professor

Preface

NCREEE-19 is organized by the Department of Electrical and Electronics Engineering, MBC College of Engineering and Technology, Kuttikkanam, Peermade, Kerala for presenting and sharing recent accomplishments and technological developments in the field of Electrical Electronics Engineering.

NCREEE'19 has received 259 high quality paper submissions from various states of India. After a rigorous review process, the program committee accepted 78 papers for inclusion in the conference proceedings. The primary goal of this conference is to provide a platform to elaborate the contribution in the field of Electrical & Electronics. This conference also intends to bring eminent, academicians, researchers, scientists, engineers and students to share their knowledge. Bringing out their innovating ideas and research outputs related to their areas of expertise and express their suggestions & improvements to the conference theme.

ISSN 2349:5162

Conference website: http://mbcpeermade.com/Research/NCREEE%5E19

Editors: Robins Anto, Lordson Devasia

Table of Contents

Selected Papers

Message from Director's Desk

Er. Roy Vairamon
Director

I am pleased to welcome you all for the Conference on Recent Advances in Electrical and Electronics Engineering (NCREEE19) being organized on 27th April 2019 at Mar Baselios Christian College of Engineering and Technology, Peermade, by the Department of Electrical and Electronics Department of MBCCET. It with utmost pride that I propose this message to the entire team of National Conference and the participants

The events in the conference are targeted towards researchers, practitioners, professionals, educators and students to share their experience, innovative ideas, issues, recent trends and future directions in field of Electrical and Electronics Engineering and other avenues of Science and Technology.

My best wishes are there for all the participants and knowledge aspirants from various technical educational institutes and research institutions around the country for a thorough and useful understanding of the ideas and exhibitions through this National Conference NCREEE19. In a nutshell, the conference promises to transcend to a new and unprecedented level of excellence. It has become a milestone of MBCCET and Department of Electrical and Electronics Engineering. I wish NCREEE19 a grand success.

Message from Cor-Episcopa

Rev. Fr. John C Chirathilattu
Former Director

It gives me an immense pleasure to be a part of the first edition of National Conference on Recent advances in Electrical and Electronics Engineering. I am happy that the Department of EEE under the leadership of Prof. Robins Anto, is striving towards excellence and NCREEE19 is yet another effort to disseminate the developments in science and technology to common man and society. I strongly believe that this conference will provide tools and knowledge to overcome significant problems appearing in our industry too and society by identifying innovative ideas and technologies introduced by the researchers and students.

The success of this Conference is solely on the dedication and efforts of innumerable people from the Department of Electrical Engineering and guidance by the head of the Institution. Let the success of this conference encourage all 'MBCians' to take up many more initiatives for innovative trends in the coming years. Eventually I express my special thanks and appreciation to all. I offer all my prayers and wishes for NCREEE2019, and all the best for its success.

May God Bless you all.

Message from Principal's Desk

Dr. Pradeep C
Principal, MBCCET

It is my great pleasure to welcome you to for the National Conference on recent advances in Electrical and Electronics Engineering (NCREEE'19), organized by the Department of Electrical Electronics Engineering on 27th April 2019. It has been a real honor and privilege to serve as the General Chair of the conference. In the first edition of NCREEE19 itself, it provides a cross-disciplinary venue for researchers and faculty members, UG and PG scholars too. The conference also focuses on latest research areas including IOT, Nano applications etc. NCREEE is a one day program which includes a Keynote by eminent researcher, presentations, panel discussion and poster presentation.

The conference would not have been possible without the enthusiastic and hard work of by a number of colleagues lead by the Convener and Head of the Department of Electrical Engineering Prof. Robins Anto. I would like to express my appreciation to the Event chairs, Coordinators, Chair of various Committees and Co-chairs, Advisory Committee, for their valuable contribution in assembling the high-quality conference program. We look forward to an exciting week of insightful presentations, discussions, and sharing of technical ideas with colleagues from around the world. We thank you for attending the conference and we hope that you enjoy your visit to visit Kuttikkanam, the evergreen hill station of Idukki Distirct, Kerala

Message from Dean's Desk

Dr. Anoop K J

Professor and Dean (Academics)

Welcome to the first National Conference on Recent advances in Electrical and Electronics Engineering – NCREEE'19 which is held on April 27, 2019. It has been a real honour and privilege to serve as the Programme Chair of this Conference.

Research activities across all the engineering fields pave the way for the industrial world to strive forward with huge advancements. As an educational institution, encouragement and support to research can be provided by establishing a suitable platform for the research community, to interact with each other and to share the knowledge. Having this objective, this conference would bring together the technologies and researchers who share interest in the area of Electrical and Electronics Engineering. Moreover, this conference points to enhance the spirit of innovation among Faculty Members, Research Scholars and Students. Further, the Conference focuses to promote discussions on research and relevant activities in the thrust area of electrical, electronics and computer engineering fields. Also, NCREEE'19 aims at increasing the synergy between academic and industry professionals working in this area.

The conference would not have been possible without the enthusiastic and hard work of a number of colleagues. I would like to express my appreciation to all the supporters for this conference. This proceeding of the conference has been documented with utmost care. I believe strongly that, this will stand as a great source of knowledge on the recent advancements in the field of engineering.

With great pleasure and pride, I convey my best wishes for NCREEE'19.

Message from HOD's Desk

Prof. Robins Anto

Welcome all to NCREEE19...

With utmost proud we present the first edition of NCREEE, National Conference on recent advances in Electrical and Electronics Engineering at MBCCET. It's a wonderful initiative of the Department of Electrical and Electronics Engineering. Almost 3 months back when the call for papers was initiatied, we received a very warm response from researchers, UG and PG scholars. Among the 200 plus papers received 78 papers were shortlisted for presentation, after strict evaluation process. The acceptance rate is 38.5%

We appreciate the support of the IEEE PES and KSEBEA for NCREEE by with Chair of various Sessions and needful technical guidance. I am indebted to Er. Roy Vairamon, The Director of MBCCET for his support and guidance. I heart fully thank the eminent guidance and vision of our Program chair and Principal Dr. Pradeep C. Also I express my gratitude for Dr. Rajesh Abraham Joseph,(Associate Professor, Indian Institute of space Science and Technology, Trivandrum) the Keynote speaker of the program for accepting our invitation. The final result of NCREEE19 would not have been possible without the dedication and hard work of my colleagues. Special thanks are due to the Prof. K Kanchana the Event chair, Coordinators Prof. Sherin Samuel and Prof. R Griesh for their valuable contribution for development of this conference. I need to place on record the hectic work done by the Editors of the proceedings led by Prof Lordson Devasia and Prof. Fini Fathima. I appreciate the financial Chair Prof. Tomina Thomas for dedicated effort in her portfolio. Thankfully remember the contribution by Prof. Vineetha P Joseph being the chair of track management and Prof. Snehapriya Sebastian

in her duties as chair of H R management. The invitation committee chaired by Prof. Resmara.S successfully completed their task by reaching nationwide. Thanks to all faculty who supported him. Thanks to other chairs including Prof. Anoop Joy, Co-chairs Prof. Ansu Thomas, Prof. Prasanth, Prof. Annu Mary Zacharias and Prof. Deepa Suresh for their kind all round support for the success of NCREEE19.

The objective of NCREEE, conference is to establish itself as a national reference for the dissemination of high-quality research in all aspects of Electrical and Electronics Engineering and recent developments fostering interaction and exchange of ideas over the coming years and editions.

Wish you all a nice time at MBCCET

Regards.

Prof. Robins Anto, MIE, MIEEE, MISTE

Convener, NCREEE-19

Message from Event Chair

Prof. K Kanchana

Associate Professor (EEE)

It is my great pleasure to welcome you to the International Conference on Recent advances in Electrical and Electronics Engineering – NCREEE '19. Electrical and electronics engineering and its various applications are an interdisciplinary and exigent ground of research due to the several daily life and industrial applications. The Conference aims to bring different ideologies of engineering under one roof and provide opportunities to exchange and share ideas face to face, to establish research relations in a mutual way. NCREEE'19 focuses to endow with a collective stage to the Students, Academicians and Industrial people to deal with the challenges, most recent developments, inventions in the various fields of Electrical and Electronics Engineering and share their expertise. Collaborations coming through the conference might cultivate academic and industry oriented research and developments. This conference will be exceptional in many ways, a muscular accentuate is being prepared for a well-balanced and effective academic - industrial participation, High quality papers and presentation sessions delivered by national delegates from academic and industry communities. I would like to thank my colleagues and students for their contribution in successfully organising and managing this conference. This event wouldn't have been possible without the guidance and constant support of my higher authorities too.

I hope that NCREEE'19 will act as a medium for all participants to ponder upon the topic of discussion, challenge us to strive towards it and inspire us at the same time. I wish this national Conference "NCREEE'19" a grand success…. Thank you!

PAPER ID: 102

Advanced Electronic Voting Machine

Amal Johan*, Mathew Abraham*, Akhil Babu*, Poly Ben Antony**

Abstract:

Electronic voting machine are getting popular day by day to conduct election in today's modern era. Our country has lot of voters, therefore the information for voting also becomes typically vast. To make proper use of this information in election for faster and transparent election process, more advanced electronic voting machine has become a necessity. Currently available electronic voting machine have some issue with their security, vulnerability and power backup. This paper is about the design and construction of an advanced electronic voting machine (AVEM) with greater security and power backup compared to the existing electronic voting machine (EVM). The machine is integrated with finger print and various steps of hardware security layers. The process of casting vote includes the identification of user within stored database by comparing their corresponding biometrics. Therefore the proposed design ensures accuracy, transparency, security and faster result processing in election comparing to existing voting system.

Keywords – Voting, Electronic Voting Machine, Microcontroller, Finger Print Scanner, Biometric, Fingerprint , Secure Voting.

* UG Student, Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology. ** Assistant Professor Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology.

PAPER ID: 103

Fault Detector for Solar Grid Connected System

Aswin Suresh*, Febin K Varghese*, Rahul Eapen George*, Reshma Manoharan**

Abstract:

Abstract-The most common way of harnessing energy from the sun is through photovoltaic (PV) panels. These panels operate as conductors, taking in the sun's rays, heating up, and creating electricity. However, fault can occur and detecting the fault in solar panels is a difficult and lengthy process. The main objective of this project is to design an error detector and alerting system for an On Grid system of solar panels. Current sensors connected to the solar panel and the grid analyses the flow of current. If the panels are not generating power while the grid is in supply, this means that a fault has occurred in the solar panels. Thus, the user must be aware of the fault. So whenever such a case occurs, a message will be sent to the user's mobile phone through GSM module, which is interfaced to the Arduino Uno board, therefore warning the user of the fault so that immediate action can be taken.

Keywords: photovoltaic, solar panel, monitoring system, GSM module

* UG Student, Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology. **Assistant Professor Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology.

PAPER ID: 104

CNC Automation

Tessin Treesa*, Jobin P Thomas*, Christy C Kuruvilla**

Abstract:

Computer Numerical Machines are used to shape metal parts by milling, drilling etc. It is a highly precise way for manufactures to make sure all their parts are within the set tolerances. A CNC machine consists of various controllers like computer controlled servo amplifiers, servomotors, spindle motor and various toolings. As CNC machine contains various sensitive electronic circuits, the user must provide quality input power for the machine and also necessary earthing. In earlier days achieving productivity up to the desired level was not possibilities due to lots of drawbacks like the complication of shapes and sizes, lack of skilled labours, lots of wastages and scraps due to unexpected mistakes and low-quality levels and accuracy. By using automated CNC, all these drawbacks can be overcomed. CNC machines have high cost and losses due to down time of the machines are also heavy. It is found that 50% of losses from CNC machines are due to breakdown caused because of electrical problems. Our aim is to reduce the manufacturing losses and completely automate the CNC.

Keywords— CNC MACH 3 control, open loop stepper, auto tool zero, tool interchangeable, bed extendable

* UG Student, Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology. ** Assistant Professor Dept. of Electrical and Electroncis Engineering, St Joseph's College of Engineering and Technology.

PAPER ID: 108

Low-cost Smart Air Purifier and Cooling system using Raspberry Pi

Yashawant Basu*, Ankit Malik*, Gerardine Immaculate Mary**

Abstract:

This paper proposes a concept to build a low-cost and efficient air purifier and cooling system with smart IoT capabilities using Raspberry Pi. The novelty of the prototype lies in its usage of Peltier technology combined with low power consumption and smart IoT capabilities to deliver a cheap and efficient air purification and cooling solution. HEPA filters have been used as these are efficient in removing particulate matter and allergens from air. The sensors MQ135 and MQ7 monitor the air quality for high levels of gases and warn users if the levels are unhealthy. A temperature and humidity sensor, DHT11 is also present. A relay-based switching system is present to turn off the device for a given time period set by the user. An Android application adds to the convenience of the user for monitoring the air quality and remote control of the device through Wi-Fi.

Keywords: *Air Purifier, cooling system, Raspberry Pi, MQ135, MQ7, DHT11, Peltier plate, IoT, SMPS, HEPA (High Efficiency Particulate Air) Filter, Relay, pollution, Android application*

Reference:

[1] "Air purifier market size worldwide 2015-statistic," https://www.statista.com/statistics/735835/air-purifier- market-size-worldwide/, (Accessed on 04/02/2019).
[2] M. A. E.-L. Mowad, A. Fathy, and A. Hafez, "Smart home automated control system using android application and microcontroller," International Journal of Scientific & Engineering Research, vol. 5, no. 5, pp. 935–939, 2014.
[3] P. Bhagwat, "Bluetooth: technology for short-range wireless apps," IEEE Internet Computing, vol. 5, no. 3, pp. 96–103, 2001

*UG Student, School of Electronics Engineering Vellore Institute of Technology Vellore, Tamil Nadu, India. **Assistant Professor, School of Electronics Engineering Vellore Institute of Technology Vellore, Tamil Nadu, India.

PAPER ID: 111

HYBRID BIDIRECTIONAL DC-DC CONVERTER FOR PV SYSTEM WITH ENERGY STORAGE

Haritha.P* , Shanifa Beevi S**

Abstract:

This paper focuses on hybrid bidirectional dc-dc converter (HBDC) for the simultaneous power management of multiple energy sources. The converter has the advantage of using low component counts, which is a combination of switched-capacitor converter and an inductor based converter. To make the system cost effective a single switch high step up dc-dc converter is introduced in between the PV panel and HBDC, which is developed by combining boost and sepic converter with diode capacitor circuit to reduce the stress across the semiconductor devices. The system provide simultaneous power management when the HBDC and high step up dc-dc converter is interfaced with PV by proper change of duty ratio which is obtained through MPPT. The simulation results shows that the high step up dc-dc converter is capable of maximum power point tracking when there is solar radiation, and the HBDC is capable of controlling the charge and discharge of the battery, when there is surplus energy and power deficiency with respect to the load.

*UG Student, Dept. of Electrical & Electronics, Rajiv Gandhi Institute of Technology, Kottayam.
**Assistant Professor, Dept. of Electrical & Electronics, Rajiv Gandhi Institute of Technology, Kottayam.

PAPER ID: 115

Electromagnetic suspension system for Automobiles

Abin Kuriakose *, Vidya Venu Nair*, Shalman S*, Nishanth Santhosh*, Priya Saji**

Abstract:

Presently automobiles and machines use in compressible fluids as shock absorbers in order to absorb sudden shocks and vibrations that arise under motion. These shock absorbers provide damping effect thus converting Kinetic energy of sudden shock into heat energy which is then dissipated. Our attempt is to design electromagnets in order to replace these shock absorbers by using the concept of polarity. This system consists of an electromagnet, a permanent magnet and a 12V battery assembled in such a way that a clearance is maintained between these electromagnet and permanent by placing similar poles on the same side. Whenever there is a sudden shock (or) a vibration, this clearance between two electromagnetic plates provides damping effect. This project resulted in increased comfort for passenger travelling in automobiles and reduced annoying sounds in machines. Also it avoids environmental pollution caused by the leak of fluids and gases used in suspensions such as hydraulic, pneumatic etc. It also minimized the damage to the floor carried due to vibrations. Moreover the additional advantage using this concept is clearance can be varied by making changes in the input voltage and the number of windings.

Keywords: *Electromagnet, magnetic levitation, damping, sensors, Environment protection, current controller.*

Reference:

[1] "Electromagnetic Suspension System-A Review" IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 3 Issue 3, March 2016.
[2] "Design and analysis of dynamic electromagnetic suspension system for improved vehicle stability" ARPN Journal of Engineering and Applied Sciences, VOL. 11, NO. 2, JANUARY 2016 ISSN 1819-6608.
[3] "Active Electromagnetic Suspension System for Improved Vehicle Dynamics" IEEE Vehicle Power and Propulsion Conference (VPPC), September 3-5, 2008, Harbin, China.

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam. ** Assistant Professor, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam.

PAPER ID: 116

PIEZOELECTRIC ENERGY HARVESTER FOR WIRELESS SENSOR NETWORKS

Jayakrishnan E P*, Jaseena Sayeed**

Abstract:

Wireless sensor networks have gained interest of engineers and utility handlers in various areas of applications like military, environmental applications, home applications, monitoring water distribution infrastructure to help drinking water utilities to have better understanding water quality. The attractions of these networks are primarily they can avoid plenty of wiring which is expensive. One of the challenges that we face while deploying wireless sensor networks is limited power resources for operating them. Current commonly used power supplies for sensor node are batteries. Batteries have many drawbacks such as short life time, periodic on- site checkup and maintenance and need to be replaced on regular basis which is uneconomical and hard to manage depending on the site of applications. This work focuses on the vibration based energy harvesting, specifically using piezoelectric materials. For practical use of vibration energy harvester with piezoelectric materials, it is necessary to process the alternating current (AC) by using different rectifier circuits in order to charge batteries with direct current (DC) or to feed electronic devices. Simplified models with simple resistive loads are being focused in most of the studies and works, but in real world applications the loads are not that simple. In this scenario, the goal of this present study is to estimate the output power provided by a cantilever beam, develop an energy harvesting using harvest-store-use methods and finally power the wireless sensor node. Polyvinylidene difluoride (PVDF) and Lead Zirconium Titanate (PZT) cantilever beams have been used in this study. The piezoelectric energy harvester consists of the piezo-element, rectifier, dc-dc converter and the load, which have been modeled and simulated in LTSpice , the output from the harvester is conditioned and regulated to 3.3V . From the results obtained after conditioning shows that , it is possible to use this harvester using combination of cantilever beams to power the wireless sensor device working with a specific duty cycle.A brief comparison of various energy harvesting methods with their advantages, disadvantages and performance have also been discussed.

*UG Student, Dept. of Electrical & Electronics, TKM College of Engineering and Technology, Kollam.
** Assistant Professor, Dept. of Electrical & Electronics, TKM College of Engineering and Technology, Kollam.

PAPER ID: 117

CURRENT MEASUREMENT USING HALL SENSORS IN ELECTRONIC METER

Bijila Lainakumar*, Viki Prasad**

Abstract:

The demand for energy is constantly rising due to the increase in energy consuming activities all over the world. As people use more and more home appliances and each device require more power, energy measurement plays a very significant role in smart homes. These demands are not fully met by the traditional power grid hence smart grid came into existence. The goal of this transition is to move from one route correspondence into two way correspondence. Generation, transmission, and distribution are the important application of smart grid. Smart meter, smart socket etc. are the common form of smart grid technology. The key elements in measuring energy are the sensors employed. Current measurement is essential for monitoring, control, power management and protection. In this proposed paper, the measurement of current in an electronic Watt-hour meter using Hall Effect sensor and comparison of the existing current measurement techniques is discussed. There are different techniques for current sensing, such as, ohms law of resistance, faradays law of induction, magnetic field sensor and faradays effect. Based on these techniques the different methods like shunt resistor, current transformer, rogowski coil, magneto resistor, and Hall Effect and flux gate sensors are classified. Here MSP430F67791 microcontroller from Texas Instruments is used for the measurement of current and voltage. It has been particularly produced for energy metering applications. The MSP430F67791 has inbuilt 24-bit sigma delta analog to digital converter (SD24_B-ADC). The IAR embedded workbench is the IDE used to develop the application software. The IAR embedded workbench is an arrangement of improvement devices for building and investigating the implanted applications utilizing constructing agent, C, and C++. The 16 bit MSP430 devices from Texas Instruments are supported by the IAR apparatus. Based on performance and some common applications comparison between the different current sensing methods is proposed. With different input signals the SD24_B ADC digital output discrete values are tested and compared with the theoretical values of voltage from the sensor.

Reference:

[1]   Suman Das, (2014). "Design of Smart Electrical Energy Metering Using Hall Device",

[2]   Zelijko N.Popovic, (2012). "Smart Grids Concept in Electrical Distribution System", Vol.16, pp. S205-S213.

PAPER ID: 118

Reducing the Grid Dependency of Large Buildings through Renewable Integrated Microgrids

Manuel Sathyajith Mathew*, Jom Joseph+, Ebin Jose+, Anuraj M Nair+, Rinu Susan Roy**

Abstract:

In this paper, we investigate the possibilities of reducing the grid based conventional energy consumption in large buildings through the integration of a microgrid supplemented by renewable energy sources. An educational building, with an average annual consumption of 317.55 MWh was chosen for the study. Based on the daily energy consumption pattern of the building and renewable energy resource potential at the site, a microgrid has been optimally designed for minimizing the Cost of Energy. It could be seen that, 38.8 % of the total energy demand of the building can be met by wind energy, by installing a turbine of 40 kW rated capacity, which would contribute 129.3 MWh per annum to the proposed microgrid. This can also reduce the cost of electricity from the current rate of 0.12 \$/kWh to 0.107 \$/kWh. Sensitivities of the Cost of Energy, renewable energy system capacity and excess renewable energy, on the renewable penetration levels are presented. The sensitivity of the Cost of Energy on different levels of emission reduction through increased renewable penetration is also discussed. The technical feasibility and economic viability of renewable integrated microgrids, in reducing the grid dependency of large buildings, has been established under this study.

*UG Student, Dept. of Electrical & Electronics, University Brunei Darussalam. + UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Idukki. ** Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Idukki.

PAPER ID: 123

Smart E-Bike with Accident Detection System

Amil K Mathew*, Adharsh Manohar*, Akshay K Raj*, Jaimon P Joseph*, Neethu Thomas**

Abstract:

The main objective is to design an electric bike which is ergonomic, efficient and cost effective. By developing these types of technologies we may able to reduce the consumption of fossil fuels. In addition to the electricity as a fuel, another smart feature called as the accident detection feature makes this bike smart. Here we do not need to design a separate frame or skeleton for the bike, whereas we have to just replace the IC engine of an existing bike with BLDC motor. In this way the bike becomes cost effective and affordable. These types of technologies can be adopted by the ordinary people too. The accident detection feature works on the basis of intelligent operation done by the Nodemcu. A tilt sensor, vibration sensor and GPS module is connected to the Nodemcu. Therefore at the time of accident these sensors work simultaneously and generate a (SOS) message to the nearby police control room or hospital. Thus with the help of this feature we may be able to save the life of many people who are using this bike. By the development and adaptation of these technologies it will change the entire face of our country to a new era. Many other features like anti-theft system, smart helmet, parental monitoring system etc..can be added in the nearby future.

Keywords: *frame, brushless dc motor, accident detection system*

Reference:

[1] N Pavan Kumar Reddy, and K.V.S.S VISHNU PRASANTH, "On Next Generation Electric Bike," IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI-2017)

[2] Md. Syedul Amin, Jubayer Jalil, M. B. 1. Reaz "Accident Detection and Reporting System using GPS, GPRS and GSM Technology" IEEE/OSAIIAPR International Conference on Informatics, Electronics & Vision 2012, pp. 640-643 .

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science and Technology, Ernakulam,India. **Assistant Professor, Dept. of Electrical & Electronics, Vijnan Institute of Science and Technology, Ernakulam,India.

PAPER ID: 125

SEMI-HUMANOID ROBOT FOR LIFE SAVING AND PROTECTION USING IOT

Vishal Chacko*, Shinto Tony*, Abin Geevarghese*, R Griesh**

Abstract:

Many accident and disaster are happening around our eyes, rescue mission are also done but not 100% secure or successful. Many heroes are born by sacrificing their life to save others. Few months back our state has faced the biggest flood and many fought for helping other where no one can communicate or rescue but still many did and many couldn't , what if there is another flood or any other disaster which would be much worser than this. Here we are creating a machine to help human beings in any such situations . A Semi-humanoid robot which will be stronger than any average human being. We will be using IOT based controller devices and an Exo-skeleton which will be employing latest sensor (FLUX Sensor) that are flexible and easy to change the actions of the robot. High definition cameras for live visual capturing. LORA wireless network is used to bring up communication much easier so that there won't be any interference with other networks. For lifting and moving we use gear motors so that they can lift from 5 kg and above. We are focusing on saving life from anywhere, anyplace weather at any distance, with this technology any authorized people can easily use. Also, it can be used for military purpose.

Keywords: LORA (Long range wireless communication), Flux sensor, IOT (Internet of thing).

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 126

Smart Energy Meter With DSM Capabilities

Sachu Philip*, Abin J Dani*, Ebin C Mathews*, Renoy Xavier*, Reshmi V**

Abstract:

India's energy intensity per unit of GDP is higher as compared to other countries which indicates inefficient use of energy but also substantial scope for energy saving. Energy is one of the most imperative aspects of a country's technological progress. Efficient use of energy and it's saving is essential for sustainable development. Demand Side Management (DSM) is a vital function to manage energy. The DSM can attain reduction in energy utilisation and cost savings via optimally developed methods. During the peak hours the use of electricity is high, but the capacity of the utility cannot be increased just to supply power in the peak hours due to limitations in natural and financial resources. The proposed DSM system can tackle the above crisis by implementing various DSM techniques, thus providing energy management and energy conservation. It can also provide financial benefits to the consumer. EON is an intelligent demand side management system with built-in energy metering capabilities. The system cuts off the loads according to preset time periods defined by the user or during the default peak consumption time. With the help of an in-home display, the user can monitor their individual load consumptions and can also schedule cut off times. The system consists of a main control unit and several sub-nodes. The main control unit consists of a micro-controller which controls all the sub-nodes and the display. The MCU communicates with the sub-nodes via a wireless trans-receiver module. A 2.2 inch TFT screen displays all the required information. The system consists of two modes, peak time load clipping mode and manual scheduling mode. In peak load time clipping mode, the loads except lighting loads are cut out during the peak hours i.e. 7 PM to 10PM. The timing is provided with the help of a Real Time Clock (RTC) module. The main control unit is responsible for monitoring and controlling the load appliances which are connected to the sub-nodes. Hardware results indicate the effectiveness of the proposed DSM system. The termination of loads was performed within the test conditions. The energy recorded and displayed was found to be precise with respect to the rated values of the loads used.

Reference:

[1] Anjana, S.P. and Angel, T.S., 2017, December. Intelligent demand side management for residential users in a smart micro-grid. In 2017 International Conference on Technological Advancements in Power and Energy (TAP Energy) (pp. 1-5). IEEE.
[2] Garcia, F.D., Marafão, F.P., de Souza, W.A. and da Silva, L.C.P., 2017, March. Power metering: History and future trends. In 2017 Ninth Annual IEEE Green Technologies Conference (GreenTech) (pp. 26-33). IEEE.

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.
**Assistant Professor, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.

PAPER ID: 127

TORQUE RIPPLE REDUCTION OF BLDC MOTOR USING CUK CONVERTER

Ashwin K Philip*

Abstract:

The BLDC motor is used in many applications because of its advantages like high power density, higher torque to inertia, higher efficiency, improved reliability, fast dynamic response and lesser maintenance. The main drawback associated with the BLDC motor is that the armature current cannot be commutated easily. So it produces current ripple thereby leading to torque ripples. The current ripple is produced due to the influence of armature winding inductance. Many technologies have been used to reduce the torque ripple such as SEPIC converter, NPC converter etc. A comparative study between diode bridge rectifier with two level inverter and CUK converter with two level inverter are made. The CUK converter topology reduces the torque ripple better than the diode bridge rectifier. The converter is connected so that it lifts the dc link voltage according to the motor speed. The output of CUK converter is observed. The performance of the proposed system is verified by simulation.The CUK converter has advantages like high efficiency, less switching voltage stress, and produces high output voltage even if the input voltage is low. The BLDC motor can be used in robotics, consumer electronics, heating and ventilation, industrial engineering, aerospace, automotive electronics and medical applications.

Reference:

[1] Vaiyapuri Viswanathan , Seenithangom Jeevananthan, "Hybrid converter topology for reducing torque ripple of BLDC motor," IET Power Electron., 2017, Vol. 10 Iss. 12, pp. 1572-1587

*PG Student, Dept. of Electrical & Electronics, Rajagiri School of Engineering and Technology, Ernakulam.

PAPER ID: 128

AMICA: An Intelligent Shopping Robot

Stevens Johnson*, Nithin Issac*, Midhun V.M*., Ann Mariya Mathew*

Abstract:

The growing trend and requirement of robots assisting humans in their surroundings have been explored considerably. Recently, the area of autonomous mobile robots increased the demand for various types of applications such as enhancing the physical mobility of elders, assisting in the transportation of products, and providing precise information for the user in a more intelligent manner. Intelligent shopping robots robots are designed and developed to interact with customers. This paper presents an intelligent shopping robot which will provide useful shopping information and also perform the collection of products. The developed intelligent shopping robot gives priority to improve space utilization, increase energy conservation with effective time management. This developed robot is basically a line follower robot which has the ability to collect the required items from the shopping complex. The major parts of the robot are - a robotic arm, a movable chassis and a collecting basket. This project proposes that the supermarket is designed like a square having different nodes. A node represents one item in the supermarket eg: biscuit, soap, etc. To get the exact brand each node consists of a bundle of same brand products and whole collection of products are identical. There is an interface (list of products) for the customer to interact with the robot. Once the order is placed the robot starts its intended function and collects the ordered products from the racks or the designated area for the products. When the shopping is over, it will transfer the items to the billing section. The customer can access the products from the billing section, where billing is done in the traditional way. Dijkstra's algorithm is used to implement the path planning needed for the efficient functionality of the robot. Using this algorithm the shortest path to the destination is determined after considering all the possible paths to the destination. The simulation was performed in V-REP PRO EDU to make the code solid. The code from Visual Studio gets mirrored onto V-REP PRO EDU to run the simulation.

Keywords:

Reference:

[1] Conception and Implementation of a Supermarket Shopping Assistant Robot - Antonio Marin-Hernandez, Guillermo de Jes´us Hoyos-Rivera, Marlon Garc´ıa-Arroyo, Luis Felipe Marin-Urias, Department of Artificial Intelligence, Universidad Veracruzana ,Mexico
[2] Design and Implementation of Line Follower Robot, Mehran Pakdaman Tabari, Institute of Babol, M. Mehdi Sanaatiyan Mazandaran Institute of Technology, 2009 Second International Conference on Computer and Electrical Engineering

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.
**Assistant Professor, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.

PAPER ID: 129

Energy Audit and Management

Athul Thomas*, Ajay Sasi*, Fenny Varghese*, Libina Rose Sebastian*, Joffie Jacob**, Victor Jose**

Abstract:

Educational Institutions are the major contributors to energy intensive operations in India. Energy cost is one of the problems in the institute's budget. Electricity consumption can be reduced with targeted efforts and by using various energy management methods. Resultant energy saving provides a venue for the reinvestment in the educational institute itself. This paper presents an energy audit of the college site (Amal Jyothi College of Engineering, Kottayam). The review begins by gathering data of all the feeders in the college and the past record of electricity bills. This data is then inspected to realize how much energy is used. The load curve of each feeder in the college along with the power consumption data was obtained. From the above data we noticed that some buildings consume more energy. So, we mainly concentrated on these buildings that are RB (Resource Block), STP (Sewage Treatment Plant), Laundry and Kitchen. The data are obtained using some devices such as power quality and energy analyzer, clamp meter and lux meter. Power quality analyzer technology tracks numerous electrical parameters which include voltage, current, frequency, peak demand, harmonic distortion etc. Lux meter is used to measure the lumens and clamp meter is used to measure the power respectively. After analyses of this readings, we have suggested some of the energy and demand side management that can be implemented in each of this buildings so that energy consumption can be reduced to a minimum level. Time of working of all the buildings was also analyzed along with the data.

Keywords: *Energy Audit, Power Quality Analyzer, Clamp meter, Lux meter*

Reference:

[1] Muhammad Usman Khalid, Mariam Crul, Ahsan Hashmi, "Energy Conservation Through Lighting Audit",2012 IEEE International Conference on Power and Energy,2-5 December 2012,page no:840-845

[2] S.N Chaphekar,Ruturaj Ajitrao Mohite,"Energy Monitoring by Energy Audit and Supply Side Management",2015 IEEE International Conference on Energy Systems and Application,30 0ct-01 Nov 2015

[3] J.Zhang,Y.C Zhang,S.Chen and S.H Grong,"How to reduce Energy Consumption by Energy Audits and Energy Management",IEEE tech.Manag in Energy Smart World Conf 2011,pp.1-5,2011

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.
**Assistant Professor, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.

PAPER ID: 132

ULTRASOUND PULSER

Saptha S.S*, Jaseena Sayed*

Abstract:

There is a growing interest in a hand held ultrasound system for point -of-care diagnosis.This paper deals with the design and implementation of low cost, efficient and adaptable ultrasonic pulser system front end which can be used in medical as well as nondestructive purposes. Principles of operation of instruments which use ultrasonic waves to 'see with sound' enables one to use ultrasonic's for medical imaging, non-destructive testing, materials evaluation and for instrumentation in the process industries is presented. A method for prediction of the geometric focus location in focused ultrasound transducer which represents the transition between the near field and the far field is developed here.The application adopted here is for ultrasonic flow meter and ultrasonic anemometer which works on the principle of time of flight. The time taken by the ultrasonic sound to travel from a transmitter to a receiver is expressed as the time of flight. Mechanical anemometer works well in good weather but it is not suitable to in bad environmental conditions. Ultrasonic anemometer works well in most situations. Moreover, it has wider detectable wind speed range which makes it more advanced instrument to measure wind velocity. In this paper, the theory of ultrasonic anemometer is discussed. Using the theory, an experimental setup is then designed and constructed to measure wind speed. Different platforms are available to generate the code for this application,here we use Micro vision Keil (IDE). The proposed system is aimed to have a better accuracy at lower cost when compared to other the existing systems.

Keywords:

Reference:

[1] Kajal V. Ingale, Vashwant Kale, "High voltage ultrasonic pulser", Industrial Electronics and Electrical Engineering, ISSN(p): 2347-6982, Volume-5, Issue-7, Jul.-2017.
[2] Liu Runbo Li Yujun He Xiaoliang "Ultrasonic wind speed and direction detector designation based on DSP [J]" Electronic design engineering no. 2 pp. 22-24 2015.

*UG Student, Dept. of Electrical & Electronics, TKM College of Engineering, Kollam.

PAPER ID: 133

Automatic Painting Machine

Donna Thomas*, Cecil Susan Kurian*, Sona James*, Therese T. Rose*

Abstract:

Abstract- The need of automation in the field of construction is increasing on a daily basis. This makes the automatic process of painting important. This can not only reduce the time lag caused by this strenuous process but also reduce the manual labour required. Also, manual painting of high rise buildings tend to be a threat to both the labourers health and life. The automatic painting machine can paint walls with minimal human intervention. This machine aims to provide horizontal and vertical movement of the sprayer, which is used to paint the wall. For this we make use of motors and control systems. This paper can be used as reference for information of motors used and of control circuits incorporated in this machine.

Index Terms – Field of construction, Automation, Painting machine, Sprayer, Motor, Control circuit.

*UG Student, Dept. of Electrical & Electronics, St. Joseph's College of Engineering and Technology, Palai. **Assistant Professor, Dept. of Electrical & Electronics, St. Joseph's College of Engineering and Technology, Palai.

PAPER ID: 135

MICRO WIND TURBINE BASED STREET LIGHT

Akshay Sreenivasan*, Amal Shah S*, Martin Mathew*, Nahinu Nizar*

Abstract:

Rural areas lacks with the availability and reliability of electricity due to its geographical and climatic conditions. So we are switching over to renewable energy resources. Renewable energy resources is the major energy sources in remote areas. We are using wind energy as one of the energy source. In this paper we are designing a micro wind turbine for powering street light in Amal Jyothi College Of Engineering(AJCE). Here we analysed wind velocity of different areas in AJCE and it can be concluded that the average wind velocity in our location is 1.5m/s. Using this wind velocity we designed wind turbine. We studied about different wind turbine that is Vertical axis and Horizontal axis Wind Turbine and found out that Vertical Axis Wind Turbine is suitable for lower wind velocity. Savonius type VAWT is used here as it is suitable for low wind velocity. The generator used here is permanent magnet axial generator as it rotates in lower rpm and produce maximum power and it is light in weight. A battery is also used to store energy and a converter is used so that battery don't get overcharge and do not get drained, in our case LED used is 5W.

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kanjirappally.
**Assistant Professor, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kanjirappally.

PAPER ID: 136

Human Occupancy detection in commercial buildings using IoT

Sara Johnson*, Dr. Shihabudheen K.V**

Abstract:

A thorough understanding of the interaction of occupants and indoor environment has been the key component towards occupancy comfort and energy efficiency of the buildings. In order to take control over the physical systems of buildings, user comforts and energy consumption needs to be optimized. Video camera, PIR motion detectors, reed switches and various environmental sensors like temperature, humidity, acoustics, illumination, carbon dioxide are used for determining occupancy. Multiple sensor networks and various sensor combinations were also tested. Most of the above said models detect the presence/absence (binary detection) and not counting of people. And it was found that single sensor network of carbon dioxide is the dominant one out of all due to high Pearson coefficient, high R^2 value, privacy concerns, no LOS required, no transmitter-receiver required etc. The sensor measures the CO2 concentration in a selected closed space at different days and at different time periods; simultaneously, a temperature sensor also measures the temperature and humidity of the room and decision tree algorithm is used to classify according to number of people.

Keywords:

Reference:

[1] Irvan B. Arief-Ang, Flora D. Salim, and Margaret Hamilton, "RUP: Large Room Utilisation Prediction with carbon dioxide sensor", in Pervasive and Mobile Computing, vol. 46, pp. 49-72, 2018

[2] J. Ahmad, H. Larijani, R. Emmanuel, M. Mannion, A. Javed, "Occupancy detection in non-residential buildings – A survey and novel privacy preserved occupancy monitoring solution", in Applied Computing and Informatics, 2018.

*PG Student, Dept. of Electrical & Electronics, TKM College of Engineering and Technology, Kollam.
** Assistant Professor, Dept. of Electrical & Electronics, TKM College of Engineering and Technology, Kollam.

PAPER ID: 137

Review of Integral Dynamic Control Technology For Air And Missile Defence Control System

Sherin Samuel**

Abstract:

High level networking model and technology suitable for effective management of large distributed dynamic air and missile systems will be described which can be cope with different kinds of unpredictable and asymmetric situations including massive air and missile attacks. The resultant traditional distributed system with many interacting parts into compliance with the initial idea. The resultant solution may be predominantly static, if the initial idea changes, the whole system may have to be partially or even completely redesigned and reassembled. The existing multi component system designed for one idea to an essentially new one may result in a considerable loss of the system's integrity and performance. The new ideology for high level management of distributed dynamic systems that can be useful for advanced air and missile defence that many targets can be simultaneously captured over the defended area and individually followed and studied by spreading mobile intelligence propagating in networked space. The ideology and technology developed can convert any distributed system into an integral dynamic brain which can quickly asses and withstand asymmetric situations and threats, protect critical infrastructures, with local and global conflicts as well as avoid and terminate them at different stages of their development.

Key words: *Distributed control,Air and missile systems,Defence system, Assymmetric situations,Integral dynamic control*

Reference:

[1]
[2]

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 138

Simulation of Solar Energized Stepper Motor For Fab Labs Applications

Oshin Peter *, Unnikrishnan L**

Abstract:

Solar energy extends it applications over a wide variety of fields and it's been very evident that solar energized equipments are highly preferred for their low running cost. Inorder to setting up a less expensive fabrication laboratories, low cost CNC equipments are required. Stepper motors are widely used in CNC machines based on cost, versatility, life span & motor design. In this paper we dealt with simulation of solar energized stepper motor for fab labs under various irradiance conditions and at different load conditions. Simulation results are presented to verify solar energized stepper motor using MATLAB-SIMULINK.

Keywords: *CNC, DIY,PO*

Reference:

[1] Alexandru Morar ,"The modelling and simulation of bipolar hybrid stepping motor by Matlab/Simulink ", Procedia technology 19(2015)576-583.

[2] Takashi Kenjo ,"Stepping motors and their microprocessor controls ", Monographs in Electrical and Electronic Engineering ,Clarendon press, oxford science publications ,1984.

[3] Marvin Barivure Sigalo, Lewis T. Osikibo " Design and Simulation of Dc-Dc Voltage Converters Using Matlab/Simulink ", American Jour. of Engg. Res. (AJER)vol.5, Issue-2, pp-229-236.

*PG Student, Dept. of Electrical & Electronics, Rajagiri School of Engineering & Technology, Ernakulam, Kerala,India. **Associate Professor, Dept. of Electrical & Electronics, Rajagiri School of Engineering & Technology ,Ernakulam, Kerala,India

PAPER ID: 139

A Hardware Framework for Smart Speaker Control of Home Audio Network

Sneha Priya Sebastian**, Vineetha P Joseph**

Abstract:

In this paper, an intelligent audio system controlling multiple speakers through a network cable and a USB cable used as an interface to a living room PC to connect to the proposed main controller. More distributed approach to multi-channel systems is. The main controller connects all speaker channels serially via a network cable through sub controllers that are distributed across the rooms. The network cable interface between the sub-controllers and the main controller uses a custom-made transmission protocol. This protocol allows the main controller to provide multiple CD quality audio sources to different locations in a house. Furthermore demonstrate a bidirectional communication capability to allow seamless personalized listening at all locations in the home with the proposed protocol between the main controller and the sub-controllers. Multi-channel speaker systems configured as a home network appliance in modern houses are still mostly based on analog systems. These audio system cause connection and maintenance problem because of complex wiring. The main system consists of a USB 2.0 controller including the 8051-core and Altera's Cyclone II FPGA.

Keywords:

Reference:

[1] Moovin Song, Doo Young Yi, Ohkyun Kwon, Yunmo Chung, "Serial Connection of Speakers for Multi-channel Audio System," Proceedings of ISEE 2003, pp.440 – 443, Japan, November 2003

[2] Moovin Song, Ohkyun Kwon, Yunmo Chung, "A Serial Connection Technique of Speakers for Multi-channel Audio systems," IEEE Transactions on Consumer Electronics. Vol. 51, No.2, pp. 611-616, May 2005.

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 140

A Novel Control Technique For Power Quality Assessment Of Railway Traction Using RPC

Vineetha P Joseph**, Sneha Priya Sebastian**

Abstract:

Railway traction has become an important part of power system. It creates power quality issues in the grid. Negative sequence and harmonic currents have become the main issues in high speed train traction systems. A V/V traction transformer has been adopted for power supply to the traction. Railway static power conditioner (RPC) has been developed to mitigate the power quality issues. A comprehensive technique for compensation of negative sequence and harmonic currents has been discussed. RPC is a back to back connected converter with a dc link. The controller also provides a constant dc link voltage and thus helps in the compensation of power quality problem. Thus RPC improves the power quality in railway traction.

Keywords:

Reference:

[1] An Luo , Fujun Ma, Chuanping Wu and Shi Qi Ding, "A Dual loop control strategy of Railway Static power Regulator Under V/V Electric traction System",   IEEE Transactions. Power Electronics,. vol. 26, July 2011.

[2] An Luo , John Shen and Chuanping Wu, "Railway Static Power Conditioners for High- speed train traction power supply systems using three phase V/V transformers" , IEEE Transactions. Power Electronics, vol. 26, October 2011.

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 141

TOBC with PI Control

Chikku Joseph*

Abstract:

A third order boost converter is capable of giving higher voltage gain. The converter is more suitable to interface the given low voltage source to a high voltage dc point of load or to a dc bus. The converter has simple structure, therefore the control of the converter is simple. This converter overcome the limitations of the previous converters including FIBC and FOBC.

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam.

PAPER ID: 142

Speed and direction control of dc motor through wireless communication

Amal R*, Anandhu P Shaju*, Jibin Thomas*, Vishnu S*, Anjana Manuel**

Abstract:

Today most widely used systems are wireless because these systems are less in cost and more efficient than wired systems. In wireless systems we do not use wires so these systems are light in weight and free from line losses i.e. losses due to current flowing in the wires. Wires are easily affected by environmental conditions, so wired systems are not so good. In wireless systems, the data transmitted through the Electromagnetic Waves and these waves are not affected by the environmental conditions. Also the environment is not affected by these waves. Hence this is a eco-friendly method. Today motors are everywhere. In every industry motors are playing a great role. In home appliances motors are playing a common role. So the use of this project will reduce a number of wires which are being used daily. And the reduction in number of wires will reduce the electrical losses.

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam. **Assistant Professor, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam.

PAPER ID: 143

SUBHAKSHA - Solar Powered Graphite Stove

Rohan Thomas Philip*, Parvathy P Pai*, Alen Joseph Tom*

Abstract:

Graphite is an indispensable natural resource. Graphite forms the quintessential part in refractory applications. Since graphite is an essential component used, there is a need to extend its application to different fields and promotes its usage. This universal element is critical to the needs of the present generation and reaching out globally. The use of ferromagnetic materials and metals in induction cooker and solar cooker is the foremost crisis ever confronted due to high power and instantaneous heating changes. Another area susceptible to cooking application is in mass dwellings where peoples rely upon fuel consuming conventional gas stoves for their daily routines. This project deals with the conservation of fuel and energy by introducing a Solar Powered Graphite Stove (SUBHAKSHA) for daily household cooking as well as for commercial users. Graphite heating and exploitation of solar power are the two main techniques used. This system can be employed in food industries and domestic potable cooking systems. For domestic applications, continuous use is made possible with this proposed technique. Heating of the graphite coil can be done using a DC source. For environmental considerations, proposed system employs a solar panel for heating the graphite coil. Specific features like reduced operating cost, less energy consumption and reliability are incorporated in SUBHAKSHA and are user friendly.

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kanjirappally.

PAPER ID: 144

A Battery Energy Management System And Motor Drive For Electric Vehicle Applications By Using A Multilevel Converter With Hybrid Cascaded Structure

Puneeth Raj Jitty *, Subhash Raparthi**

Abstract:

Generally large number of battery cells will be connected in series to increase the output voltage of the motor drive system .The SOC and unbalanced output voltage will lead due to the variations in electro chemical parameters. A battery energy management system and motor drive using a multilevel converter with hybrid cascaded structure for EV is proposed in this paper. Control method of battery cell is studied and one of each battery cell can be controlled and it can be bypassed through half bridge converter.Therefore, to improve the performance of the motor drive the ouput of the H-bridge converter consists of less harmonics and lower dv/dt with multilevel voltages. And also the energy utilisation ratio of batteries can be improved according to SOC of each cell. The other advantages are terminal voltage imbalance and SOC are avoided.

Keywords: *Electric vehicle(EV) , Battery cell, hybrid cascaded multilevel converter , Pulse Width Modulation(PWM)*

Reference:

[1] H. M. Zhang and S. P. Ding, ―Application of synergic electric power supply in HEV,‖ in Proc. 8th World Congr. Intelligent Control Autom., 2010, pp. 4097–4100.

[2] S. M. Lukic, J. Cao, R. C. Bansal, F. Rodriguez, and A. Emadi, ―Energy storage systems for automotive applications,‖ IEEE Trans. Ind. Electron., vol. 55, no. 6, pp. 2258–2267, Jul. 2008.

[3] K. Jonghoon, S. Jongwon, C. Changyoon, and B. H. Cho, ―Stable configuration of a Li-Ion series battery pack based on a screening process for improved voltage/SOC balancing,‖ IEEE Trans. Power Electron., vol. 27, no. 1, pp. 411–424, Jan. 2012.

*UG Student, Dept. of Electrical & Electronics, KU College of Engineering and Technology, Warangal.
**Assistant Professor, Dept. of Electrical & Electronics, KU College of Engineering and Technology, Warangal.

.

PAPER ID: 146

Dam Water Level Monitoring and Alerting System

Kripa Mariya Joseph*, Sanjay Kumar*, Vineetha Krishnan*, Gokul Krishnan*

Abstract:

Man-made dams are designed to stop or interrupt the flow of water across a river. The history, culture, current and future socioeconomic status of India and its people are linked to the water resources which are available from dams. The water from the dam can be used for farming and producing electricity. The dams are acting as a reservoir for keep the water, at the same time improper dam management leads to flood. So a proper management system to be implemented for the sake of safety of people. At present the dam water level is measured and uploaded manually. This will cause time delay and may lead to sudden back water rise. This paper gives an idea for the implementation of an information system based on the traditional systems with the utilization of some sensors and IoT. In this paper we introduce an automatic system where the dam water level is raised above a threshold value, messages will be send to the mobile numbers.

Keywords: *Water level, ultra sonic sensor, Thingspeak, Arduino, Dam*

Reference:

[1] Nikhil M. Dhandre entitled "Dam Parameters Monitoring System" Published in 2015 1st International Conference on Next Generation Computing Technologies (NGCT-2015), Dehradun

[2] J. A. Hern´andez-Nolasco, Miguel A. Wister, Francisco D. Acosta and Pablo Pancardo entitled Water Level Meter for Alerting Population about Floods published in 2016 IEEE 30th International Conference on Advanced Information Networking and Applications I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.

[3] Rastko Martać1, Nikola Milivojević1 entitled Using internet of things in monitoring and management of dams in serbia published in Electronics and Energetics Vol. 29, No 3, September 2016, pp. 419 – 435

*UG Student, Dept. of Electronics and Communication, College of Engineering and Management, Punnapra. **Assistant Professor, Dept. of Electronics and Communication, College of Engineering and Management, Punnapra.

PAPER ID: 148

Malayalam Braille Transmutation to Text and Speech using FPGA

Kanishma krishnakumar*, Riya Jose*, Mahalekshmi.V*, Adithya R*, Veena Gopan**

Abstract:

Abstract— The Braille system has been used by the visually impaired peoples for reading and writing and also for the communication and contact with the outside world. This paper presents the implementation of Malayalam Braille Recognition with voice and text conversion. The input is applied as different combinations of six cells to the FPGA Spartan 6 processor. It is converted into corresponding Malayalam text through the decoding logic in Verilog language. The corresponding alphabet is displayed on the desktop using an interface with the Spartan 6 processor. Also it is converted to speech using an IC aP890341/170/085.

Keywords: *FPGA, Braille language, Braille to Malayalam word converter*

Reference:

[1] S.Padmavathi, Manojna K.S.S, Sphoorthy Reddy .S & D Meenakshy., "On Conversion of braille to text in English, Hindi and Tamil languages" International Journal of Computer Science, Engineering and Applications (IJCSEA) Vol.3, No.3, June 2013

[2] K.Parvathi, B. Maynoher Samal & Jitendra Kumar Das,"Odia Braille:Text Transcription via Image Processing"1st International conference on futuristic trend in computational analysis and knowledge management (ABLAZE 2015)

[3] Xuan Zhang, Cesar Ortega-Sanchez & Iain Murray," Reconfigurable PDA for the Visually Impaired Using FPGAs" International Conference on Reconfigurable Computing and FPGAs, 2008.

*UG Student, Dept. of Electronics and Communication, College of Engineering and Management, Punnapra. **Assistant Professor, Dept. of Electronics and Communication, College of Engineering and Management, Punnapra.

PAPER ID: 151

Hardware Implementation of PI Controller using Genetic Algorithm for NOEL Converter

B.Achiammal**, M.Thillaikarasi**

Abstract:

Negative Output Elementary Luo converter (NOELC) is one of the DC-DC Converters. Due to the time-varying and switching character of the converter, its dynamic performance becomes highly non-linear. Conventional PI controller has unsatisfactory dynamic performance for such converter and hence Genetic Algorithm based PI (GA-PI) controller have been developed to tune the PI parameters. In this paper, design and implementation of ZN-PI controller and Genetic algorithm based PI (GA-PI) controller using TMS320C5420 DSP have been developed and experimental results of the above converter under supply disturbances and load disturbances are presented and analyzed.

Reference:

[1]J.F.Huang, F.B.Dong, "Modelling and Control on Isolated DC-DC Converter", Power Electronics, voI.44, 2015, pp.87-89
[2] J.You, S.B.Kang,"Generalized State Space Averaging based PWM Rectifier Modeling", Electrical Measurement & Instrumentation Vo1.46, 2009, pp.67-70,

**Assistant Professor, Dept. of Electronics and Instrumentation, Government college of Technology, Coimbatore.

PAPER ID: 153

MPPT and Battery Management System

Anandhakrishnan S*, Chithra Thankachan*, Praveen Kumar P S*, Rahul K*

Abstract:

This paper aims to presents the design and development of a photovoltaic system based on the enhanced P&O algorithm that allows to improve efficiency, stability and accuracy of solar system using MPPT and BMS. Maximum Power Point Tracking algorithms (MPPT) are used to track maximum power, a sepic converter is used to obtain the impedance matching between the PV array and the load. Although a huge number of approaches have been proposed in literature, the methods based on the perturb and observe (P&O) technique are the most widely employed in commercial products. The reason lies in the fact that P&O can be implemented in cheap digital devices by ensuring high robustness and a good MPPT efficiency. A battery management system (BMS) is any electronic system that manages a rechargeable battery such as by protecting the battery from operating outside its safe operating area, monitoring its state, calculating secondary data, reporting that data, controlling its environment, authenticating and balancing it.

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam.

PAPER ID: 154

DESIGN & ANALYSIS OF 30 kW PHOTOVOLTAIC SYSTEM FOR MBC LIBRARY BUILDING IN KUTTIKKANAM

Sachin Sam Stephen*, S Sreedev*, Abraham Mathew*, K Kanchana**, Prasanth K G**

Abstract:

The main objective of this paper is to design and analysis of solar PV system for an isolated building. This paper is done to evaluate the feasibility of stand-alone roof top solar PV system for MBC library building at Kuttikkanm, Kerala, India (Latitude:9o35'N Longitude:76o56'E). The detailed designed equations for estimating different types of load are given here. This paper is not only dealing with design steps, but also analyzing the comparison of different AC loads (LED, CFL, Tubelight, T5 lamp) and DC loads. The panels required for different loads are calculated both manually and using PVSyst software. The effective and performance analysis of 30kwp solar p-v roof top plant is done using PVSyst software and the result are presented here. The characteristic of PV array, normalized energy, irradiation and daily array output are analyzed for this system and results are presented here. The design of battery equation required for this system are presented here. The installing cost and total expenditure of different lighting load are compared and suggested the suitable one for the system. The CO_2 emission for various lamps in AC and DC was analyzed and is included.

Keywords: *PV; Design of Stand-alone PV Systems; PVSyst; Poly-crystaline PV Panel*

Reference:

[1] Kucuk, S., 2017, November. Steps for industrial plant electrical system design. In 2017 10th International Conference on Electrical and Electronics Engineering (ELECO) (pp. 1435-1439). IEEE.
[2] Kanchev, H., Hinov, N., Amaudov, D. and Stanev, R., 2017, May. Modelling and control of a grid-connected PV system for smart grid integration. In 2017 40th International Spring Seminar on Electronics Technology (ISSE) (pp. 1-6). IEEE.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 155

Non Human Like Walking Bipedal Disaster Response Robot

Ajay Krishnan*, Anjali Johnson*, Raymon P Robin*

Abstract:

Robots agile enough to be able to perform in disaster scenarios costs a fortune and this high cost is a major wall against fully fledged application of robotics in disaster scenarios. This project focuses on building a hybrid bipedal- wheeled robot with non-conventional humanoid walking but increased speed and stability. Traditional legs are complicatedly designed to reduce oscillations during bipedal walking. Humanoid bipedal walking creates oscillations in robots. These oscillations are due to the offset in the hip of a human. Oscillations lead to small calculated steps taken by the robot. This Non-Anthropomorphic Bipedal Robotic System modifies the traditional bipedal form by aligning the legs in the sagittal plane. The robot has a height comparable to a small child and yet it weighs much less. A wheeled leg platform opens up a new path for robot locomotion. The robot will be further equipped with an arm and cameras which would make it easy for the person controlling the robot. We look forward for a wide range of applications for our robot, mostly in the disaster-find and rescue scenarios. Efficient bipedal walking at low costs puts the use of robots in dangerous situations at a more favourable position.

Keywords: *bipedal, rescue, disaster*

Reference:

[1]   Anjani Kumar ,Ankur Bhargava, "Arduino controlled robotic arm," in International Conference on Electronics, Communication and Aerospace Technology, Delhi, 2017.

[2]   S. Kajita, F. Kanehiro, K. Kaneko, K. Yokoi and H. Hirukawa, "The 3D linear inverted pendulum mode: a simple modeling for a biped walking pattern generation," Intelligent Robots and Systems, 2001. Proceedings. 2001 IEEEIRSJ International Conference on, Maui, HI, 2001, pp. 239-246 vol l.

*UG Student, Dept. of Electrical & Electronics, Sree Ernakulathappan college of engineering and management, Thrissur.

PAPER ID: 156

Smart and Eco-Friendly Pest Repellent Scheme For Agricultural Lands

Jibin Joseph*, Pravin Sam G*, Geevar Paul*, Aromal Krishna*, Anoop Joy**, Fini Fathima**

Abstract:

Agriculture plays a vital role in the field of Indian economy. Over seventy percent of the rural households depend on agriculture and agriculture is a main source of income for more than sixty percent of the Indian population. But nowadays, most of the agricultural sector and crop yield are affected by the pest bug attacks as well as by the wild animals. Many studies proved that the sound waves in frequency of range above 20 kHz known as the ultrasonic frequency waves can be effectively used as a pest repellent and can cause significant reduction in the pest pairing as well as reproduction of pests. Comparing to other types of pest control, ultrasonic pest control is found to be more effective as ultrasound makes a hostile environment which confuse, disorient and repels the pests and do not cause any environmental impact. Our paper proposes a smart protection scheme for agricultural lands which incorporates the use of ultrasound to repel the pests as well as the employment of predator deterrent lights and sounds in scaring wild animals. The Arduino Uno microcontroller connected to a crystal oscillator is used to generate the ultrasonic sound for pest control. They produce a square wave of the specified frequency with specific duty cycle on a digital pin connected to the amplifier circuit based on power amplifier with an 8-ohm speaker. This ultrasound generation unit present in the system can produce different types of frequencies to repel the pests. Since ultrasounds are present in the range above the human audible frequency, humans are not affected by the ultrasonic frequency sound waves. The ultrasound generation system can be controlled by three methods- DTMF control using GSM cell phone from a remote distance, manual control via switches and LDR for night mode. The system is provided with motion sensors and vibration sensors which senses the wild animals and turn on the predator deterrent systems to scare them. Since the system is powered by solar energy provided with a charge controller and battery energy storage system, the system is a cost-effective and eco-friendly.

Reference:

[1]"Design a smart insect repeller using ultrasonic sensor" By Nur Najjah Mohd Nasir, Faculty of EEE, Universiti Malaysia Pahang, (June 2012)
[2] "Development and preliminary testing of an electronic Pest repeller with automatic frequency variation", (January 2013)

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 159

Drover For Post Disaster Search and Rescue

Nejiya Khader*, Jane Susan Jacob*, Tincy Merin Thomas*, Jerin Joseph*

Abstract:

This project is based on the real life experiences that we came across as volunteers of the flood that struck Kerala in the month of August 2018. We realized from the witnesses of the victims that most of them were rescued after quite a long time. There were also incidents where family members had to keep watch over the dead bodies of their loved ones, whose lives could have been rescued had the rescue team arrived earlier. An effective Search and Rescue mechanism is imperative to contain the toll on human lives. Rovers and drones have been in use in such situations for some time now. But they both suffer from some limitations that can greatly affect the effectiveness of their functions. Drones suffer from some limitations that can greatly affect the effectiveness of their functions. They face problems such as fast depletion of battery and decreased mobility indoors like collapsed hallways. Rovers, on the other hand, find it difficult to overcome obstacles like fallen boulders and debris. Also, the on board camera offers only one perspective from the ground level. Combining both drone and rover into a single standalone unit can really improve the effectiveness of the search and rescue operations as it offers increased mobility and flexibility. Equipped with an on-board camera and an image processing system coupled with wireless transmission capabilities, a drover, or the combined drone rover platform, can become a powerful tool for post disaster search and rescue operations. A drover will be able to fly over obstacles and hover over certain areas to offer more camera angles to properly assess the situation. Also, when working as a rover, the drover will use only less power without compromising its ability to move. An infrared camera and a suitable image processing system could further enhance the performance of such a versatile platform. In the end, it's the performance of the platform that matters; or in other words, its ability to detect the presence of human life in the quickest time possible. A drover would certainly be able to speed up the search and rescue process further.

*UG Student, Dept. of Electronics and Communication, Viswajyothi college of Engineering and Technology. **Assistant Professor, Dept. of Electronics and Communication, Viswajyothi college of Engineering and Technology.

PAPER ID: 163

Automatic Irrigation And Fertilisation System Using Arduino

Aravind Vijayan*, Bibin Alex*

Abstract:

In this project, we aims to irrigate the farm by a soil moisture sensor control by Arduino using soil moisture sensor and GSM module. This automatic irrigation system senses the moisture content of the soil and automatically switches the power of the water tank when the supply is available. We can use the system in any climatic conditions. India being an agriculture country. Most of the people depends on agriculture. So the irrigation and fertilisation is an important factor, as many places in India is affected by lack of rainfall. As we are using a GSM module. It will display the indication of water level in the tank, on our mobile phone. Not only irrigation, we can also provide fertilisers through this project, a fixed time interval is set on the Arduino board. So that the fertilisation can be provide according to this time interval. The aim of this implementation is to reduce the water usage and can save the irrigation and fertilisation time.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 164

Vehicle Navigation with Accident Messaging System

Anoop Joy**

Abstract:

A new approach to gathering data for intelligent transportation system applications over a continuous-flow of traffic rather than at discrete locations, as is the case with many existing technologies. The detailed algorithms mean complete navigation solution, including attitude, position and velocity of the vehicle respectively. This kind of integrated navigation consists of inertial navigation based on MEMS, GPS and magnetometer, the goal of research presented in this paper is to provide some frontier study for the development and research of the intelligent transportation system.

Keywords: *Vehicle Navigation, MEMS, Intelligent Transportation System*

Reference:

[1] Model-Based Probabilistic Collision Detection in Autonomous Driving Matthias Althoff, Olaf Stursberg, Member, IEEE, and Martin Buss, Member, IEEE , IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 10, NO. 2, JUNE 2009
[2] Architecture and algorithm of intelligent vehicle navigation system based on   MEMS Zhiping Liu Fan Yu Coll. of Comput., Xi'an Technol. Univ., Xian, China .This paper appears in: Intelligent Vehicles Symposium, 2009 IEEE Publication Date: 3-5 June

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 162

TEXT-TO-IMAGE SYNTHESIS USING GENERATIVE ADVERSARIAL NETWORK WITH LSTM AND GRU

Ishu Anand*, Vibhor Singh*, Ankit Jain*, Vishesh Devgan*, Narina Thakur*

Abstract:

Synthesizing realistic images from textual data i.e. description automatically is a challenging problem in Machine Learning, and has many real-world applications in domains of animation and digital design. Current state-of-the-art systems mostly employ some form of GAN along with a RNN. In this project, we are proposing a novel architecture by combining features of GANs along with (i) LSTM (ii) GRU. Our study shows promising results, with the synthesised flower images being quite realistic while also having a good amount of detail.

Keywords: *LSTM, GRU, GAN, text-to-image*

Reference:

[1] C. H. Lampert, H. Nickisch, and S. Harmeling, Attribute-Based Classifi- cation for Zero-Shot Visual Object Categorization, IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 36, no. 3, pp. 453465, 2014.

[2] Y. Fu, T. M. Hospedales, T. Xiang, Z. Fu, and S. Gong, Transduc- tive Multi-view Embedding for Zero-Shot Recognition and Annotation, Computer Vision ECCV 2014 Lecture Notes in Computer Science, pp. 584599, 2014.

[3] S. Reed, Z. Akata, H. Lee, and B. Schiele, Learning Deep Representations of Fine-Grained Visual Descriptions, 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016.

*UG Student, Dept. of Electrical & Electronics, Bharati Vidyapeeth'sCollege of Engineering, Delhi.

PAPER ID: 166

Solutions for the Challenges of Smart Grid

Teddy Thomas**

Abstract:

Smart grid has emerged as an interesting field in the power and energy researches. Efficient implementation of smart grid can solve the current challenges faced by traditional grid .The implementation of distributed generation and digital rather than the centralized generation and electromechanical leads to an efficient power generation and distribution. This paper addresses the relevant solution to the key challenges including strengthening the grid , Enhanced intelligence , Communications and Preparing of hybrid vehicles.The solution includes the integration of digital twin AL modeling technology and google map model grid analysis.Thus this paper solves many challenges faced by traditional grid technologies.

Keywords: *Smart grid, Efficient implementation, Traditional grid, Key challenges, Digital twin AL modelling, Solutions.*

**UG Student, Dept. of Computer Science Egineering, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 167

Assessment of Temperature in Induction Heating by Inductive Sensor

Libin Liya*, Mathew Jose*, Shealtieal Sacharia Koshy*, Sherin Samuel**, Annu Mary Zacharias**

Abstract:

In this paper we are introducing a new inductive sensor for temperature measurement in induction heating industries and simulation of a colpitts oscillator circuit that produces an inversly varying frequency output, according to the inductance value of the induction coil is done in LABview software. LABview is a software virtual instrumentation tool in which hardware configuration is possible. The oscillator circuit is coupled with the software by using Arduino kit. Different types of contact and non contact temperature sensors were analysed. We have done a comparison and analysis of contact temperature sensors like thermistor, RTD, thermocouple and the non contact sensor like infrared sensors. It was found that high frequency oscillators can be used to detect the frequency variations in the induction heating device. Colpitts oscillator was found more suitable for the detection of frequency variations, so we have selected the colpitts oscillator for this purpose. The colpitts oscillator have the frequency range of 20KHz to 300MHz.

Reference:

[1] Inductive Sensor for Temperature Measurement in Induction Heating Applications Carlos Franco, Student Member, IEEE, Jesús Acero, Member, IEEE, Rafael Alonso, Carlos Sagüés, Member, IEEE, and David Paesa, Student Member, IEEE.

[2] Adaptive Observers Applied to Pan Temperature Control of Induction Hobs David Paesa, Sergio Llorente, Carlos Sagüés, and Óscar Aldana

[3] QFT-Based Robust Simmering Control for Domestic Induction Cookers Using an Infrared Sensor D. Paesa, C. Franco, S. Llorente, G. Lopez-Nicolas and C. Sagues

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 169

METAL AND EXPLOSIVE DETECTOR

Aswathy Santhosh*, Mohammad Zeeshan*, Muhammed Mijas*, Roshni Johnson*, Swetha R*
Lordson Devasia**, Prasanth K G*

Abstract:

Nowadays a lot of attention is being paid to the development of methods and instrumentation for the detection of explosives. Infrastructural facilities, like railway stations, airports, undergrounded railways, water supply etc are preferred targets involving up to thousands of people. This project aims to implement a security system which can detect metals and explosives in remote locations using switch mode. As a single system is used for both the detection mechanisms it will be economical. The detection of metals has become more important than ever before. Although metal detection technology continues to be refined, all metal detectors rely on the magnetic induction principle, in which a magnetic object (such as metal, which is always magnetic), can magnetize a second object simply by their proximity. Most of the explosives have nitrogen compounds in them. This fact is exploited in detecting the explosive and thereby preventing a disaster. There are two sensor units in the device, one for explosive detection and the other for metal detection. The modes are selected by switching mechanism. The apparatus is placed on a movable platform driven by DC motors to facilitate detection in remote locations. The detection apparatus is controlled using ZigBee transmitter receiver modules. This hardware project is beneficial for the society and for its safety.

Keywords: *Metal Detector, Explosive Detector, ZigBee*

Reference:

[1] Mohammad S. Sharawi, Mohammad I Sharawi,, "Design And Implementation Of A Low Cost Vlf Metal Detector With Metal-Type Discrimination Capabilities", IEEE International Conference on Signal Processing and Communications (ICSPC 2007), 24-27 November 2007.

[2] Muhammed Ali Mazidi, "The 8051 Microcontroller and Embedded Systems", Pearson Education, 10 th Edition.

[3] Ademola Abdulkareem, Programming a computer and a Microcontroller to control the Speed and Direction of DC Motors, IJECS, Volume 3 Issue 3 March 2014, pp 5046 -5053

*UG Student, Dept. of Electrical & Electronics, Govt. Model Engineering College, Cochin. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 170

Impact of VSIs in the Analysis of Power System Security

Fini Fathima*, Dr. Prabhakar Karthikeyan S**

Abstract:

To meet the competition of the power system, the system is made to operate in an optimal manner, by considering the economic and reliable methods. This paper presents basic indicators used in analysis of voltage stability including voltages at lines, at buses and overall. In its entirety, it detailed background information about all VSIs and also it investigates the effect of VSIs in transmission as well as distribution systems. A new index is proposed and investigated to predict the voltage collapse in power system which in turn helps in reactive power planning to identify the weak locations of system. The results of the paper give a clear idea of best VSI for different applications including incorporation of renewables, micro grid, rectifying weak areas, contingency screening etc

Keywords: *Voltage stability, Reactive Power, Voltage stability Indices, power system security*

Reference:

[1] Report on the grid disturbance on 30th July 2012 and grid disturbance on 31st July 2012, Submitted in Compliance to CERC Order in Petition No. 167/Suo-Motu/2012 (dated August 1, 2012), August 2012.
[2] Maharjan, Rabindra, and Sukumar Kamalasadan. "Secondary voltage control of power grid using voltage stability index and voltage control areas." *2017 North American Power Symposium (NAPS)*. IEEE, 2017.

*PhD Scholar, SELECT, Vellore Institute of Technology, Vellore. **Associate Professor, SELECT, Vellore Institute of Technology, Vellore.

PAPER ID: 171

ANANTOMICAL STUDY OF GRID CONNECTED PV SYSTEM

Anjana A Kumar*, Beena P Thomas*, Della Susan Joy*,Vineetha P Joseph**, Ansu Thomas**

Abstract:

The demand of renewable resources has been increasing rapidly due to the environmental concerns and need of energy. Solar photovoltaic energy is currently one of the most popular and renewable energy resource on the earth. Inverter is essential component in grid connected PV systems. When PV is connected to grid through inverter some important terms like total harmonic distortion, galvanic isolation, anti-islanding detection and voltage, frequency ranges for uninterrupted operation must be in specified limits according to standards. Our paper reviews state- of part of discussion about various components in grid connected photovoltaic system. And the mitigation for the power quality issues that arise during the the solar connected to grid. The present energy need of world is mostly fed by the conventional energy resources. These resources have limited storage on the earth. The aspects like pollution, CO_2 emission, global warming pollutes the environment. Due to the development in the semiconductor technology the cost of the solar photovoltaic is reducing. Also the improvement in power electronics helps to generate electricity at high efficiency and make it possible to supply power directly to the grid. Grid connection is needed because there is better utilization of PV power and more energy is harvested. As the PV module normally generates low voltage, so a boost converter is needed to step up this DC voltage to a higher amplitude. Central inverter topologies is mostly preferred for large scale generation and it has centralized inverter and common MPPT for PV array (series-parallel connection of PV modules). String inverter topology is reduced version of central inverter, some number of modules are connected in series (string) and inverter is connected to that string is called as string inverter. In which each string has its own MPPT. Multi-string topology is evolution in string inverter for larger system in which strings have their own DC-DC converter and these strings are connected to common inverter and finally the module integrated micro inverter in which each PV modules has its own inverter and individual MPPT.

Reference:

[1] Masoud Farhoodnea, Azah Mohamed, HussainShareef, Hadi Zayandehrood,-Power Quality Analysis of Grid Connected Photovoltaic Systems in Distribution Networks‖, Przegląd Elektrotechniczny, (2013), ISSN 0033-2097, R. 89 NR 2A.
[2] Seok-Ju, L., P. Hae-Yong, K. Gyeong-Hun, S. Hyo-Ryong, M.H. Ali, P. Minwon, and Y. In-keun, ―The Experimental Analysis of the Grid- Connected PV System Applied by POS MPPT‖, In International Conference on Electrical Machines and Systems 2007. 1786-1791.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 201

Two Wheeler Safety Using Adept Helmet System

Adharsh M.A*, Ashik S.*, Indrajith S.S*, Hima Vijayan V.P**, Riyaz A.Rahiman**,
Dr. Rafeeq Ahmed K.**

Abstract:

Many two wheeler drivers could ensure their safety in accident cases if they wear helmet at the time of accident. So as to overcome these problems, an adept helmet system is proposed having a control system built inside a helmet. This is a project undertaken to increase the rate of road safety among motorcyclists. The idea is obtained after knowing that the increasing number of fatal road accidents over the years is cause for concern among motorcyclists. It consist an alcohol sensor, RF transmitter and a RF receiver system. The bike will get started only if the driver is not drunk and if he wears the helmet. RF signals will be radiated from transmitter sensed by the receiver placed in the ignition switch of the bike, the ignition lock is removed.

Keywords: *RF transmitter module, RF receiver module, relay, microcontrollers*

Reference:

[1] Ministry of Road Transport & Highways, Government of India

[2] Global status on road safety,World Health Organization,2018

[3] Minakshi Sandhaya, Smart helmet for accidental prevention, International Journal of Advanced Research In Engineering Technology & Services.

*UG Student, Dept. of Electronics and Communication, ACE College of Engineeing, Trivandrum.
**Assistant Professor, Dept. of Electronics and Communication, ACE College of Engineeing, Trivandrum.

PAPER ID: 203

Performance Comparison of Massive MIMO System with and without Channel Coding

Amina N*, Aysha Humaira S*, Fathima Shehna*, Nair Soumya Ajitkumaran*, Jazir S*

Abstract:

In this paper we concentrate on performance for Massive Multiple Input Multiple Output (MIMO) with channel coding and without channel coding wherein the performance of Bit Error Rate (BER) of both is compared. In the test setup, the Base station is incorporated with 16 antennas along with 16 User terminals with single antenna providing a reliable communication. The coded Massive MIMO system for Channel coding adopted Low Density Parity Check (LDPC) codes. The setup is simulated using Matlab. The observed simulation produces a result which shows a better performance and lower BER for LDPC coded Massive MIMO system than for the system without channel coding.

Keywords: *Massive MIMO, Channel Coding, LDPC codes*

Reference:

[1] M. Pappa, C. Ramesh and Madhushri N. Kumar, "Performance Comparison of Massive MIMO and Conventional MIMO Using Channel Parameters", Department of Electronics and Communication, CMR Institute of Technology, Bangalore, 2017 IEEE.

[2] Noha Hassan and Xavier Fernando, "Massive MIMO Wireless Networks: An Overview", Department of Electrical and Computer Engineering, Ryerson University, 26 August 2017.

*UG Student, Dept. of Electronics and Communication, ACE College of Engineering, Thiruvallam, Trivandrum.

PAPER ID: 205

360° Video Stabilization Using Geometric Transformation

Farzana Nazim*, Krishna P*, Reshma Chandran C R*, Afsal S*

Abstract:

In this paper, we concentrate on stabilizing the 360° videos which when captured instantly causes unnecessary shakiness result in cyber sickness to the spectator. 360 degree videos are video recordings where we get the complete view around us at the same time. We implemented our algorithm in Matlab R2016b. In our algorithm first we convert the unstabilized 360 degree video which is usually represented in equirectangular to cubemap. Then we extract Speeded Up Robust Features (SURF) features from each of the faces and estimate a set of outliers and inliers using RANSAC algorithm. With the application of warping technique in each frame, stabilized 360 degree video output is obtained.

Keywords: *Cubemap, Feature extraction, SURF features, RANSAC, Geometric Transform, Warping*

Reference:

[1] Chetan Arora and Vivek Kwatra.''Stabilizing First Person 360 degree Videos'', IIT Delhi,2018

[2] J. Kopf. 360. video stabilization. ACM Trans. Graph.,35(6):195:1–195:9, Nov. 2016.

[3] N. Kawai, N. Inoue, T. Sato, F. Okura, Y. Nakashima, and N. Yokoya. ''Background estimation for a single omnidirectional image sequence captured with a moving camera.'' IPS Transactions on Computer Vision and Applications, 2014.

*UG Student, Dept. of Electronics and Communication, ACE College of Engineering, Thiruvallam, Trivandrum, Kerala.

PAPER ID: 206

Intelligent Resource Management in Wireless Networks

Sherin Jacob*, Pavitha P.P.**

Abstract

In a communication system lifetime of a battery is one of the most important factor. Now the rapid growth of wireless application, demands to lead the increase of energy and spectrum utilization. More exploitation of energy and spectrum consumption wireless traffic is limited. Energy can be harvested from the radio frequency signals present in the surroundings. The scheme combines the concept of harvesting the energy wirelessly along with sharing of spectrum in a cognitive network system. A cooperative scheme is introduced which aims at increasing the throughput of both Primary Users (PUs) and Secondary Users (SUs). The simulations are done keeping in check with various constraints. This method is promising for the upcoming fifth generation (5G) technology since increased throughput directly corresponds to the high data rate. Here the use generic algorithms to solve the optimization problem. In order to increase the efficiency of the overall system, flexible time structure is also used. As enhancement introduces the concept of multiple PUs and SUs in a cognitive network. A more efficient system can be designed by considering the channel information in a detailed manner. And to solve the multi-objective optimization problem generic algorithm is introduced in order to increase the throughput and to reduce the delay.

Keywords: *Energy harvesting, generic algorithm, enhancement, optimization, throughput*

*PG Scholar, Department of Electrical and Electronics Engineering, Sree Buddha College of Engineering Alapuzha ** Assistant Professor, Department of Electrical and Electronics Engineering, Sree Buddha College of Engineering Alapuzha.

PAPER ID: 207

SOLAR PROJECTOR WITH DATA TRANSFERING AND REMOTE CONTROL

Harikrishna M S*, Nasma Latheef*, Reshma Nath B*, Shijith S Kumar*

Abstract:

Projector is an optical device that project the image on to the surface. The main problem associated with viewing an image through a projector is, if there is no power supply the projector will not work.To overcome this problem we are introducing a solar projector that will work by solar power in the absence of power supply. Also this projector having additional automatic controlling facility, that is tilt focus and rotate adjustment. Here data transferring is provided by USB port itself.

Keywords: *Solar Panel,Battery,Servomotor, Gear-Motor,Remote-Controller*

Reference:

[1] Torque-Speed Characteristics Analysis of a Magnetic-Geared Motor Using Finite Element Method Coupled with Vector Control. Noboru Niguchi and Katsuhiro Hirata Osaka University Suita, Osaka 565-0871, Japan. IEEE TRANSACTIONS ON MAGNETICS, VOL. 49, NO. 5, MAY 2013

[2] Self-Correcting Portable Projector, M.R Kulasekara, D Sandaruwan, C Keppitiyagama, N.D Kodikara, University of Colombo School of Computing UCSC Building Complex, 2017 International Conference on Advances in ICT for Emerging Regions (ICTer) : 115 -12035, Reid Avenue

* UG Student, Dept. of Electrical and Electroncis Engineering, Musaliar College of Engineering & Technology, Pathanamthitta.

PAPER ID: 208

Self-Synchronization Operation For Grid-Connected Renewable Energy System

Ansu Thomas**

Abstract:

An inverter is typically used to interface a renewable energy system into the utility grid. When major portion of the grid power is inverter-based, it will be beneficial to operate the inverter in the same way as ordinary power generators or at least to imitate some major characteristics of the conventional generators. Synchronverters are grid connected inverters that mimic a synchronous generator. Grid-connected inverters normally uses a phase locked loop (PLL) for synchronization purpose. But PLL has got number of negative impacts on control performance. In this paper, a radical step is adopted to improve the performance of the grid connected system by integrating the synchronization function into the synchronverter and thereby removing the complex phase locked loop. Thus the renewable energy system can automatically synchronize with the grid before connection and track the frequency after connection. This eliminates the slow element (PLL) in the system that affects the speed of synchronization. Hence, it improves the speed of synchronization and reduces the complexity of the controller. The controller is a power controller with capability of frequency and voltage regulation together with the self-synchronization control. The structure will also be compact. A power oscillation damper is integrated into the controller to damp out the oscillations in grid power during disturbances.

Keywords: *grid connection, PLL, renewable energy, synchronization, synchronverter.*

Reference:

[1] Q.-C. Zhong, Phi-Long Nguyen, and Zhenyu Ma, "Self-Synchronized Synchronverters: Inverters Without a Dedicated Synchronization Unit," IEEE Trans. Power Electron., vol. 29, no. 2, pp. 617-630, Feb 2014.

[2] Q.-C. Zhong and G. Weiss, "Synchronverters: Inverters that mimic synchronous generators," IEEE Trans. Ind. Electron., vol. 58, no. 4, pp. 1259- 1267, Apr. 2011.

[3] M. Karimi-Ghartemani and M. Iravani, "A new phase-locked loop (PLL) system," in Proc. 44th IEEE Midwest Symp. Circuits Syst., 2001, pp. 421- 424.

[4] L. Zhang, L. Harnefors, and H.-P. Nee, "Power-synchronization control of grid-connected voltage-source converters," IEEE Trans. Power Syst., vol. 25, no.

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

Modelling and simulation of electric vehicles through the process of optimisation in Mat Lab- Simulink

Rahul Raj*, Prince Abrahan Varghese*, Rejin Tom Tommey Jose*, R. Griesh**

Abstract:

Automobiles are an integral part of our everyday lives. Conventional vehicles are the primary cause of urban pollution by late century. The world will eventually encounter an acute energy crisis if we do not focus on alternative energy sources and transportation modes. Therefore, the international community toward developing low-emission (hybrid electric) and zero-emission (electric) vehicles to replace conventional internal combustion (IC) engine vehicles. Several auto industries have started marketing electric and hybrid electric vehicles. Furthermore, the gradual replacement of the hydraulically driven actuators by electrically driven actuators. The EVs.Modelling and simulation in Matlab-Simulink are of great value in investigating the energy flow, performance and efficiency of the EV drivetrain. The design of the EV model presented in this paper, however, is indeed a basic model. There are still many opportunities for augmentation to establish a good EV model which will form the foundation for further research and development. Modelling and simulation are significant for automotive designers to find the best energy control strategy and exact component size, and to minimise the use of energy because prototyping and testing are expensive and complicated operations. Good design leads to a reasonable compromise among flexibility, model simplicity, computational load and accurate representation of the components.

Keywords: *Electric Vehicle (EVs), Hybrid Electric Vehicles (HEVS), Actuators, Matlab-Simulink and Drivetrain.*

Reference:

[1] A review on the state-of-the-art technologies of electric vehicle, its impacts and prospects(2015)
[2] Mathematical Modelling and Simulation of an Electric Vehicle, T.A.T.Mohd,M.K.Hassan, and WMK.A.Aziz

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 217

Monitoring and Control of Greenhouse Environment for Better Crop Yield

Soumya K. G*, Abhijith P*, Ahilu Jalal*, Harsha Joseph*, Jeena James*

Abstract:

Every plant needs ideal climatic conditions for their growth. So it is practically difficult to get better yield during every season. This proposed framework is very much prepared to respond to the climatic changes happening inside the greenhouse. This setup overcomes the issues created due to human errors. The proposed system which is an implanted system that will monitor and control the climatic conditions of the plant which is placed inside the greenhouse. An automatic system continuously monitor and control the climatic parameters inside the greenhouse which facilitates the plant development and consequently provides better crop yield. This system provides climatic condition accordingly to provide yield at all season and also decrease the effect of pest and other vermin that will destroy the plant. The framework contains sensors in order to monitor different parameters such as light, temperature and soil moisture and also includes a relay module. Microcontroller controls the whole framework. This framework also compares the growth rate of plant set inside and outside the greenhouse.

Keywords: *Greenhouse, Environment, Microcontroller*

Reference:

[1] Niamul Hassan, "An Automatic Monitoring and Control System Inside Greenhouse", Department of Electrical and Electronic Engineering, BRAC University, Dhaka, Bangladesh.

[2] "Quan Minh Vu, "Automated Wireless Greenhouse Management System", Master of Engineering in Electronics and Computer Systems, Massy University, Palmerston North, New Zealand, June 2011

[3] Jose Luis Guzman, "Simulation of Greenhouse Climate Monitoring and Control with Wireless Sensor Network and Event-based Control", Department of Computer Science and Automatic Control, UNED C/. Juan Del Rosal, Madrid, Spain

*UG Student, Dept. of Electrical & Electronics, College of Engineering Kidangoor.

PAPER ID: 219

A Novel approach to differentiate between Biodegradable and Non-biodegradable waste materials in beach

K.T Anisha Jubitha*, Shamini R*, Ashna Rasheed*, Anshad P.K*, Parvathy S.B*,
Dr. Rafeeq Ahmed K**

Abstract:

This paper concentrates on a vision system for the purpose of automatic beach cleaning process which would identify Biodegradable and Non-biodegradable waste. A system that detects the object, edges and features is very important for easier and proper cleaning in all the areas. The vision system uses various techniques with the real time captured image for Object detection to find if any object or waste is present. Edge detection is used to recognize the boundary of the waste present in the area which needs to be cleaned and Feature detection is used for retaining all useful products present in that area. The proposed system uses Speed-Up Robust Features (SURF) algorithm and RANSAC algorithm for Feature detection. Canny edge operator is implemented for Edge detection and Image segmentation technique is used for Object detection. The Feature detection method is used to find out if the trash detected in a specific area is Biodegradable or Non-biodegradable. It is implemented in MATLAB R2016b with Computer vision toolbox. The real time image capturing is done with IP webcam application and IP camera support package.

Keywords: *SURF algorithm, RANSAC algorithm, Canny edge operator, Image Segmentation Technique*

Reference:

[1] Oscar Cieza, Carlos Ugarte, Elizabeth Gutiérrez, Javier García, José Tafur, "Prometeo: Beach Cleaner Robot", 2015.

[2] P. Corke, Robotics Vision and Control: Fundamental Algorithms in Matlab, 2011.

[3] Sirichai Watanasophon and Sarinee Ouitrakul, "Garbage Collection Robot on the beach using Wireless Communication", 2014.

*UG Student, Dept. of Electronics and Communication, ACE College of Engineeing, Trivandrum.
**Assistant Professor, Dept. of Electronics and Communication, ACE College of Engineeing, Trivandrum.

PAPER ID: 220

Microcontroller Based Crop Finder

Binith K M *, Abhinav Sunil*, Nivedh K*, Sreelekshmy L*

Abstract:

In society, our agricultural sector facing a major problem based on finding the suitable crops for suitable soil. The existing Soil test laboratories provide a critical step in management decisions of nutrients for optimum crop production, however the best analytical process can not compensate for poor sample collection and handling. Calibration of soil test methods and recommendations can be influenced by soil properties (soil pH, texture, seedbed moisture), agro-climatic zones and cropping systems. We find that in Malappuram crops were harmed due to the absence of technology in selecting suitable crops for suitable soil. Soil tests conducted by agricultural laboratories are chemical test. Chemical tests are more time consuming, costly and complex. In this project we are overcoming such problem by implementing microcontroller based technology. The main parameters in the soil which is useful for the crop are pH, electrical conductivity, primary nutrients such as nitrogen, phosphorus, potassium. For different crops all the parameters of the soil are different .These parameters are sensed (by pH sensor, EC sensor, NPK sensor) and the values of parameters are compared by a reference value. Hence select suitable crops for the soil.
+

Reference:

[1] Mohammad Junaid Khan, Rashid Mustafa "Soil Testing and Analyzing using AVR Microcontroller", IJECT Vol. 3, Issue 1, Jan. - March 2012

*UG Student, Dept. of Electrical & Electronics, College of Engineering pathanapuram.

PAPER ID: 222

Neural Network Based Antirigging voting machine using finger print detection

Akhil P A*, Chitra Thomas*, Rahul Ragava A K*, Nithin V*, Beenu Mary Panicker**

Abstract:

Voting process is exercised using EVM(Electronic voting machine) in INDIA and other difficult means by the rest of the world. In this proposal we present and implement a simulation of anti rigging voting system using neural network fingerprint classifier to recognize the fingerprint and this enables or disables the voting of that voter In this the fingerprint of the present voter is taken and tries to matches it with the fingerprints in database, if match is found that person can vote and that fingerprint is marked, so that multiple voting can be stopped, if it is not found that person can vote. This new process makes the voting process more secure. The analysis of fingerprints for matching purposes generally requires the comparison of several features of the print pattern. These include patterns , which are aggregate characteristics of ridges, and minutiae points which are unique features found within the patterns , It is also necessary to know the structure and properties of human skin in order to successfully employ this. Some of the imaging processing techniques such as image thinning, edge detection, filter algorithms are used in conjunction with neural network. A multilayer perceptron network is used for fingerprint recognition , it contains an input layer, hidden layer and output layer. So this new method vastly improves the credibility of the voting system compared to our present system due to the uniqueness of the fingerprint , even the fake fingerprints can be resisted easily by just using an ultrasonic fingerprint sensor if it is made into hardware.

*UG Student, Dept. of Electrical & Electronics, College of Engineering, Pathanapuram. **Assistant Professor, Dept. of Electrical & Electronics, College of Engineering, Pathanapuram.

PAPER ID: 223

Solar Based Irrigation And Feasibility Study in Growth Enhancement

Amal K Joseph*, Jeffin Jacob Paul*, Joel Shajan Varghese*, Rinu Susan Roy**, Lordson Devasia**

Abstract:

India is an agricultural country. Tons of new technologies are emerging in the field of agriculture to raise its productivity. A solar based irrigation system and itsfeasibility in growth enhancement of plants is discussed. The burden of the farmer gets reduced by providing an automated irrigation scheme. The time of water consumption and the effort taken by the farmer gets reduced. A photovoltaic system with a storage battery, back up for two days, is used to provide the electric power for the control and monitoring operations. The devices used for controlling and monitoring operations are controller, solenoid valve, timer circuit, water level detector, moisture level sensor and other electronic devices. Drip irrigation is used here because of its advantages over the conventional methods of irrigation. Using drip irrigation, the wastage of water is very less and also all the plants coming under the area of drip irrigation will get the correct and required amount of water very effectively. It is proved that red and blue lights from sun are responsible for the growth of plants. An artificial lighting system (red and blue lights) using LED strips is provided for the plants during night and this is will increase the photosynthesis of the plants during the night time. It has also been proved that the rate of growth of plants becomes faster by giving electricity to the stems of the plants. A DC supply of 4V and 5V having 5μA current is provided for a duration of 5 minutes. Polarity of supply also affects the growth of plants.

Keywords: *Smart Drip Irrigation, Artificial Light Survey, Electricity Plants, Solar PV system*

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 225

SMART ASSISTANT AND MANAGEMENT

Jayakrishnan M S*, Vishnu*

Abstract:

Home Automation Systems (HAS) have gained world-wide popularity these days. It guarantees security, surveillance and solace to the user and make their life more comfortable. In developed countries, many households have smart home automation systems which detect their surroundings and act on the data to trigger home appliances such as fan, air conditioners etc. But these systems are not very popular in developing nations as compared to developed nations because of their pricing. Also, almost all of these systems are hard coded so they just make some decisions based on iterative conditions. The system has neither user defined nor conditional control. There comes the need of Voice Controlled Home Automation Systems (VCHAS). The combinatory offers network interoperability, a simple and supple user interface, and distant access to the system. A home automation system will control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. When connected with the Internet, home devices are an important constituent of the Internet of Things. Home automation system typically connects controlled devices to a central hub or "gateway". Home automation is a very promising area. Its main benefits range from increased comfort and greater safety and security, to a more rational use of energy and other resources, allowing for significant savings. It also offers powerful means for helping and supporting the special needs of people with disabilities and, in particular, the elderly. The proposed home automation system and network are unified through a mutual home gateway, by this way we can create a distributed generation which the controllers of various generating equipment are controlled by a main controller connected in the same gateway. The proposed system may create a smart grid by adopting the cellular networking technology in which each cell consist of a smart grid and each of them are interconnected. This technology will revolutionize the existing centralized generating techniques.so our technology has the ability to make automation in home and also to create a distributed generation and smart grid which will provide higher efficiency. The controllers we using are IOT based which will provide more data handling capability through internet.

*UG Student, Dept. of Electrical & Electronics, Vijnan Institute of Science & Technology, Ernakulam.

PAPER ID: 226

RF BASED RIVER CLEANING BOAT

Jishnu Prasad*, P.Dinil*, Naveen Mathew*, Vipin Krishna R*

Abstract:

The main concept of this project is to build machine which can be used for clearing the sea lettuce and the other sea weeds which grow very often at water bodies. The clearing of these sea weeds is a difficult process and consumes lot of time when done manually. Also it is impossible to work under critical situations where the depth of the water is high and where there are high tides. This machine is made so simple such that when it is switched on, it moves automatically and the weeds are trimmed off and collected in a tray which can be later removed and disposed manually. Another advantage of this machine is that they can be operated by the solar powers. Also the battery power can also be made used. Hence this is a dual power project such that the power from the battery can be used and also the solar energy can be used for powering up the machine. The controlling of the system is done with the help of a remote control which can be operated manually from the ground.

*UG Student, Dept. of Electrical & Electronics, Thejus collage of engineering, Trissur.

PAPER ID: 227

Arduino based dust removing robot

Ans Thattil*, Josna Johnson*, Sooraj M.R*, Ancy K.A*, Vipin Krishna**

Abstract:

The research paper details the development of Automatic Floor Cleaner. The project is used for domestic and industrial purpose to clean the surface automatically. When it is turned ON, it sucks in the dust by moving all around the surface (floor or any other area) as it passes over it. The controller is used to drive the motors and the suction unit also a couple of sensors are used to avoid the obstacles. This can be useful in improving the lifestyle of mankind. In the modern era, the Automatic Floor Cleaner is required. Thus, the cleaner is designed in such a way that it is capable of cleaning the area reducing the human effort just by starting the cleaning unit. In the paper, main focus is to build and program it in such a way, that it can move around freely and clean a specific area by the vacuuming process. Brushes are attached at its side in order to collect the dust while moving. It uses Ultrasonic sensors to detect the obstacles and hence change its direction while moving and also preventing the cleaner to fall from height. For the manual controlling of the robot with the cellphone or mobile we are using the bluetooth module .

*UG Student, Dept. of Electrical & Electronics, Thejus Engineering College. ** Assistant Professor, Dept. of Electrical & Electronics, Thejus Engineering College.

PAPER ID: 236

Performance Study of Solar Photovoltaic/Thermal System At High Altitudes

Alan Sam Zakaria*, Benson M Mathew*, Sharon T Mammen*, Robins Anto**

Abstract:

The increasing installed area of solar technologies around the world gives us an idea about the unlimited potential available in solar energy. A thermophonic solar PV/T water heating system which could be used for domestic purpose has been designed constructed and tested using locally available materials. Solar energy is received by the PV surface which then utilize a small fraction of the incident solar radiation to produce electricity and the remainder is turned mainly into waste heat in the cells, this waste heat is utilized by attaching a copper pipe, and attached at the back of the PV panel to extract heat from the PV panel, thereby increasing its electrical efficiency, and an insulated casing is placed at the back of the heat exchanger to reduce heat loss to the environment. A water tank is then added to the system so that water flows from the tank to the heat exchanger, gets heated and flows into a water storage tank through thermosyphon principle.

[1] Blessy joy, J.Philip, Richu Zachariah, Solar Energy 140 (2016) 12-20
[2] Jee Joe Michael, Iniyan Sa, Ranko Goicb, Renewable and Sustainable Energy Reviews 51(2015) 62-88

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 237

SIGNAL PROCESSING METHODS FOR HARMONIC ANALYSIS

Emy Ann Jacob*, Aysha Sulaiman*, Fathima Sabila M.N*, Tomina Thomas**

Abstract:

This paper reviews state-of part of discussion about signal processing methods for harmonic analysis. Nowadays, emission in the range of high frequencies is increasing because of the fast improvement of energy saving equipment's. The bulk usage of electronic apparatus, the progress of electric power utilization and rising non-linear loads on electrical system network loads etc… leads to many power quality issues. The high frequency emission becomes one of the major challenging power quality issues. During normal operation, some of present-day appliances can emit high frequency such as compact fluorescent lamp, light emitting diodes, PV inverters, chargers of battery, etc. In order to detect these emissions so many researches are undergoing at different areas. To investigate the harmonic analysis of inverter, several experiments were performed. Similar experiments were performed using FFT analysis, for the comparison. These comparisons proved the priority of the new signal processing methods.

Keywords: *Supraharmonics, Power Quality, Power System Harmonics, High Frequency (HF) Emission*

Reference:

[1] E. O. A. Larsson, Student Member, IEEE, and M. H. J. Bollen, Fellow, IEEE "Emission and immunity of equipment in the frequency range 2 to 150 kHz"

[2] Rönnberg, S. and Bollen, M., 2016. Power quality issues in the electric power system of the future. The Electricity Journal, 29(10), pp.49-61.

[3] Darmawardana, D., Perera, S., Robinson, D., Ciufo, P., Meyer, J., Klatt, M. and Jayatunga, U., 2018, May. Investigation of high frequency emissions (supraharmonics) from small, grid-tied, photovoltaic inverters of different topologies. In 2018 18th International Conference on Harmonics and Quality of Power (ICHQP) (pp. 1-6). IEEE.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 238

Iot Based Vehicle Parking Manager

Alan Abraham Koshy*, Amal V Nair*, Jijo John*, Annu Mary Zacharias**, Deepa K Suresh**

Abstract:

One of the important considerations of being a smart city is the smart parking facility. Finding a particular space to park our vehicle becomes an annoying issue. In this paper we present an IOT based cloud integrated smart parking system. The proposed system consist of a Wi-Fi enabled Raspberry- pi that is used to monitor and signalize the availability of each parking space .A mobile application is provided to book parking slots as well as check the availability of parking slots, here a new tracking system which enables the customer to track the parking slot through application is also available. The vehicle can be parked at the reserved parking slot after verification using the RFID Technology. The project mainly focuses on implementing on shopping malls, movie theatres, hospitals etc... It also focus on reducing the time in finding the parking slots and also it avoids the unnecessary traveling through the filled parking slots in a parking area. Thus it reduces fuel consumption which in turn reduces carbon foot prints in an atmosphere. Towards the end of the paper finds a solution to the traffic congestion and ease the way to get a parking slot.

Keywords:

Reference:

[1] L. Atzori, A. Iera, and G. Morabito, "The Internet of things: a survey," Computer Networks, vol. 54, no. 15, pp. 2787-2805, 2010.

[2] Kaivan Karimi and Gary Atkinson, —What the Internet of Things (IoT) Needs to Become a Reality‖, White Paper, FreeScale and ARM, 2013.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 241

Electronic Differential System for The Dual-Front-Wheel Independently Driven Electric Vehicle

Anumol M.S*, Jesin K Saji* , Keerthi S Nair* , Vishnu K Potty* , Nandan G**

Abstract:

Differential system in transmission for speed control in electric vehicle plays an important role for preventing the vehicle from slipping on curved roads. Mechanical differential systems are heavy and bulkier. Electronic differential systems constitutes a technological advancement in electric vehicle design thereby enabling better stability and control of the vehicle on curved roads. Electric vehicles drives offers a number of advantages over conventional internal combustion engine, especially in terms of lower local emissions, higher energy efficiency, and decreased dependency upon oil. Over the long term, electric vehicles could represent a sustainable technology path. The electronic differential system provides the required torque for each driving wheel allows different wheel speeds electronically. It is used in place of mechanical differential in multi-drive systems. This constitutes the modelling and simulation of an electronic differential systems for electric vehicle which employs twomotors ensuring the smooth and controlled drive of two rear wheels.

*UG Student, Dept. of Electrical & Electronics, Sree Buddha College of Engineering , Pattoor.
**Assistant Professor, Dept. of Electrical & Electronics, Sree Buddha College of Engineering , Pattoor.

PAPER ID: 246

UNIVERSAL CONTROL SYSTEM USING ARDUINO FOR COMPLETE AUTOMATION

Anu Rani Thomas* , Swetha Ann Mathew* , Senu Mathulla George* , Sanju Thomas*, R. Griesh**, Tomina Thomas**

Abstract:

As the world is rapidly developing, we find new technology coming in deeper and deeper into our personal lives even at homes. In our daily life, from the beginning till the end we are accessing many electrical and electronics devices. From switching on a bulb to controlling a car, everything has become remotely accessible. In ancient times switches were used and nowadays application over phones are used. Today in the digital world, hackers can easily hack anything they need. In order to ascertain safety and better advancement in it, we are creating a device which can be controlled only by single user controller. With this device we can access only our own equipments which are used. A micro device which is easy to wear on hand can control the actions of the receiving devices. A transceiver module has both address of receiver as well as transmitter. A junction box which diverts the selection of equipment depends upon the user. When a device is to be controlled, the micro device is brought in the front of the sensor and creates a path to control the equipment using junction box which is programmed by Arduino. Hence by varying the motion of finger switching and other mode of operations, these devices cannot be hacked since it is providing analog signals as input.

Keywords: *Universal Control; Transceiver; Arduino; Automation; Smart Glove*

Reference:

[1] Lee, K.M., Teng, W.G. and Hou, T.W., 2016. Point-n-Press: An intelligent universal remote control system for home appliances. IEEE Transactions on automation science and engineering, 13(3), pp.1308-1317.
[2] Tadimeti, H.C. and Pulipati, M., 2013. Overview of automation systems and home appliances control using PC and microcontroller. Int. J. Sci. Res, 2(4), pp.127-131.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 250

RECOGNITION OF LEAF DISEASES USING IMAGE PROCESSING

Lamiya J A*, Pooja R Nair*, Suraj K Yadav*, Usama Yoosuf*, Sethulekshmi*

Abstract:

Agriculture stands as the major pillar in our economy. Due to this reason disease detection in plants plays an important role in agricultural field, as the plant leaves gets affected easily. Diseases in plants affects product quality, quantity and productivity severely. Thus detection of plant disease through image processing technique is beneficial for farmers. It reduces the large work of farmers who monitors big farms of crops. And also it will help to identify the diseases at very early stage. In this paper we use RGB to HSI conversion technique. This paper presents a study of image processing techniques which helps to detect and classify various plant leaf diseases automatically using Fuzzy and SVM.

Keywords: *RGB, HSI, SVM, GLCM, Fuzzy, K-means clustering*

*UG Student, Department of Electronics and Communication, ACE College of Engineering, Thiruvallam, Trivandrum, Kerala.

PAPER ID: 251

SKETCH BASED IMAGE RETRIEVAL AND SYNTHESIS USING SIAMESE CNN AND GRABCUT

Keerthana Radhakrishnan*, Chaithanya C*, Dr. Priya S**

Abstract:

Sketch-based image retrieval is retrieving images from a image database that correspond to a given sketch. Different methods are available for Sketch based image retrieval. Image synthesis is the process of creating new images from some descriptions or ideas. Image retrieval and synthesis together makes a tough work because we are creating something according to our vision. The combination of Sketch based image retrieval and synthesis will be helpful for designers those who concerned with appearance. We are using daily scene images as the data set and proposes a sketch-based image of a scene retrieval model. Machine Learning is most efficiently used technique for image retrieval. In this paper we propose a novel convolutional neural network based on Siamese network for SBIR. The retrieved image and background image is given for image sythesis. The Grabcut algorithm found to be a perfect algorithm for foreground extraction. Furthermore, system can blend the target object in the background domain hence we apply Poisson image editing.

Keywords: *Image retrieval, Image synthesis, Siamese, CNN, Grabcut*

*UG Student, Dept. of Electrical & Electronics, Viswajyothi college of Engineering and Technology.
**Assistant Professor, Dept. of Electrical & Electronics, Viswajyothi college of Engineering and Technology.

PAPER ID: 252

An In-Line Interference Analysis Model With Dynamic Frequency Allocation For Satellite Network

Lakshmy M Sreeraj*, Sreekumari Amma**

Abstract:

Satellite communication systems have become an essential part of world's communication systems. The development of satellite communication is increasing day by day. As a result the number of satellites in geostationary earth orbit (GEO) and Non geostationary earth orbit (NGEO) like low earth orbit (LEO) increases continuously. However, the available spectrum resources are very much scarce and the interference from the LEO and GEO also increasing. Interference has the effect of adding the overall noise on the satellite link and therefore degrading the quality of the received signal in the ground station. In this scenario, it is crucial to mitigate the interference between GEO and LEO systems and hence it allows spectral coexistence of the satellite network. In this paper, a general interference pattern is considered in a novel cognitive satellite network with GEO and LEO systems. Based on the interference analysis we obtained, an optimization algorithm with dynamic frequency allocation is proposed. This method demonstrates that the interference mitigation is possible in the satellite network and hence the cognitive satellite network can achieve a high spectrum efficiency and the spectral coexistence is feasible.

Keywords: *satellite communication, cognitive network, spectral coexistence, spectrum efficiency, interference, mitigation, dynamic frequency allocation.*

Reference:

[1] A. H. Sanchez, T. Soares, and A. Wolahan, ''Reliability aspects of mega constellation satellites and their impact on the space debris environment '' in Proc. RAMS, Jan. 2017
[2] W. A. Hanson, ''In their own words: OneWeb's Internet constellation as described in their FCC form 312 application,'' New Space pp. 153–167, 2016.
[3] LeoSat Non-Geostationary Satellite System Attachment A: Technical Annex to Supplement Schedule S. Accessed: Mar. 20, 2018. [Online].

*PG Student, Dept. of Electronics and Communication, TKM College of engineering, kollam.
**Assistant Professor, Dept. of Electronics and Communication, TKM College of engineering, kollam.

PAPER ID: 254

Closed Loop Control of Interleaved Boost Converter With PISO Configuration and Voltage Multiplier Module

Mani Bharathi V T* , Dr. B. Baskaran**

Abstract:

This paper presents closed loop control of interleaved boost converter with voltage multiplier cell. An interleaved boost converter with parallel input series output coupled to a voltage multiplier circuit on the output side which provides a higher voltage gain than that of a conventional boost converter. Parallel input connection is used to share the input current and to reduce the conduction losses, while the series output connection along with the voltage multiplier cell is to employ the high voltage gain. Additionally, in order to obtain the controlled output voltage from the DC-DC converter under varying input conditions, it is required to regulate the output voltage which can be obtained using closed loop control. A PI controller is implemented to improve the performance of the proposed IBC during the disturbances due to renewable energy sources. The closed loop control of the proposed IBC with voltage multiplier module is analyzed and simulated for R load using MATLAB Simulink.

Keywords: *Interleaved Boost Converter, Voltage multiplier module, High Voltage Gain, PI controller*

Reference:

[1] N.Mohan,T.Undeland,andW.Robbins,PowerElectronics–Converters, Applications, and Design, 2nd ed. New York: Wiley, 1995, Ch. 7.

[2] B.Bryant and M. K. Kazimierczuk, "Voltage- loop powerstage transfer functions with MOSFET delay for boost PWM converter operating in CCM," IEEE Trans. Ind. Electron., vol.54, no.1, pp. 347–353, Feb. 2007.

[3] X. Wu, J. Zhang, X. Ye, and Z. Qian, "Analysis and derivations for a family ZVS converter based on a new active clamp ZVS cell," IEEE Trans. Ind. Electron., vol. 55, no. 2,pp. 773–781, Feb. 2008.

*PhD Scholar, Dept. of Electrical Engineering, Annamalai University, Tamil Nadu. ** Professor, Dept. of Electrical Engineering, Annamalai University, Tamil Nadu.

PAPER ID: 255

Design And Implementation of Electric Bike With Gear

Amal suresh*, Geo jose* , Visakh MS* , Vipin benny*, Anoop K J**

Abstract:

Now a days several countries in the world face with the issue of air pollution due to the emission of carbon by the operation of transports and industry. The fossil fuels that are utilized in the urban transport are one of the key intensifying factors. Among the assorted types of the electric vehicles, the two wheels electric vehicle like electric bicycle, bike and scooter can play a crucial role in reducing urban traffic and sound pollution. Regarding to the aforementioned points, several researchers around the world are concerned in the design process of these types of vehicles. As the level of pollution in the world is rising, the adoption of electric vehicles are precisely the best option. Electric vehicles can reduce the emissions that contribute to climate change, smog, improving public health and reducing ecological damage. The operation of the Electric vehicles on renewable energy such as solar or wind minimizes these emissions even more. This paper focuses on the design of an electric bike with a gear system since the bike with gear system is usually preferred by most of the two-wheeler drivers. The design of electric scooter suggested by the investigators has less speed range and no gear. In order to overcome these problems, this paper proposes an electric bike incorporated with a gear system to get a speed range of 0-80 km/h. This innovative technique will attract the consumers which in turn improve the market strategy. Key words: Electric bike, gear system, renewable energy, fossil fuels, battery.

Reference:

[1] N. Pavan kumar reddy, K.V.S.S Vishnu Prasanth(2017) "Next Generation Electric Bike" IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI-2017), pp.2280-2285.
[2] Chun-Liang Lin, En-Ping Chen, Yu-Chan Chen, Min-Kai Liu(2017) "Advanced Driving/Braking Control Design for Electric Bikes," 12th IEEE Conference on Industrial Electronics and Applications 2017, pp.1254-1259.
[3] V.Srinu, P.Satya Sai Mounica, S.Siva Varalakshmi Devi, S.Sai Kumar and K.Vijay Teja, August(2017)"A Novel Speed Control of Brushless DC Motor Using Arduino UNO R3 and BOT" Asian Journal ofApplied Science and Technology (AJAST) Volume 1, pp. 10-14.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 256

Electricity Theft Detection Using IoT

Akhil K. George Abraham* , Alen Joseph* , Joel Benny Thomas* , K Kanchana**,Sneha Priya Sebastian**

Abstract:

In India, huge amount of power generated is left unpaid where electricity theft being one of the prime reasons for this. Electric utilities face loss due to electricity fraud i.e, illegal usage of electrical equipment or service in order to avoid billing charges. This paper presents tampering protection of energy meter and energy theft detection using Internet of Things technology (IoT). One of the major problems faced by the electric power companies is the electricity theft, which introduces power quality issues into the power system and payment loss due to the increase in power theft. In this paper, the tampering protection circuit is used for energy meter protection, where the PIR sensor (HC-SR501) present here senses the motion and sends the signals through the arduino (R3ATmega 328P) to the server. Similarly, the theft detection circuit is used to detect external bypassing theft, where the special arranged transformer circuit detects the theft and send the signal to the server through the arduino. Node MCU is used as the network interface between arduino and internet. The status of meter is monitored from anywhere at any time by the power sector through the webpage created by thingspeak platform. The online monitoring provides details or location of the energy meter present at the consumer side. This new system can produce a smart effective way of energy theft detection which reduces the major loss in the power sector companies. Additionally we are also checking the Wi-Fi connectivity of the device.

Keywords:

Reference:

[1] R. E. Ogu, G. A. Chukwudebe "Development of a Cost-Effective Electricity Theft Detection and Prevention System based on IoT Technology" 2017 IEEE 3rd International Conference on Electro-Technology for National Development (NIGERCON)

[2] M. Singh and E. V. Sanduja, "Minimizing Electricity Theft by Internet of-Things", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 4(8), pp.326-329, (2015).

[3] S. V. Anushree and T. Shanthi, "IoT Based Smart Energy Meter Monitoring and Theft Detection Using ATMEGA", International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4(11), Pp.19801-19805. (2016).

*UG Student, Dept. of Electrical & Electronics, University Brunei Darussalam. and Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Idukki. ** Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Idukki.

PAPER ID:270
Maximum Available Transfer Capacity with Renewable Energy Source

Haris K V*, Hrudhya Kurian*

Abstract:

Electric utility around the world is facing with restructuring, deregulation and privatization. And transmission network tend to be heavily loaded and transmission services become one of the most critical element. Power system transfer capability indicates how much inter area power transfers can be increased without compromising system security. For both planning and operation of the bulk power market, accurate identification of this capability is very important. Available transfer capacity (ATC) as the amount of transfer capacity that is available at a certain time for purchase or sale in the electric power market under different system conditions. The computation of ATC is very important to keep reliability and security of deregulated power system. An accurate ATC computation is also very important to the transmission system. If the computed ATC is less than the ATC of the system, the transmission of power will not be efficient economically, if the computed ATC is more than the ATC of the system, the transmission will be operating in a dangerous state and any power increased will stand a chance to collapse the whole system and the result of that is disastrous. The computation of real time ATC value is very important sine it is not fixed for a line. The value of ATC for a transmission line will vary with many cases. This project also focuses on the variation of ATC value with varying renewable energy sources, with increasing load demand and with incorporation of UPFC controllers.

Keywords: *ATC, UPFC, TTC, ETC, PTDF*

Reference:

[1] A. Khairuddin, ; N. A. Bakar "ATC Determination Incorporating Wind Generation" 2013 IEEE 7th International Power Engineering and Optimization Conference (PEOCO2013), Langkawi, Malaysia. 3-4 June

[2] Anup Kumar and Mukesh Kumar "Available Transfer Capability Determination Using Power Transfer Distribution Factors", International Journal of Information and Computation Technology, Volume 3,(2013)

* PG Scholar Department of Electrical and Electronics Engineering, Thejus Engineering college, Thrissur.

PAPER ID: 271

Automated Rubber Tapping Machine

Annu Mary Zacharias*, P.C Thomas**

Abstract:

In this paper we are introducing an automated rubber tapping machine which reduces most of the problems facing in rubber tapping sector. The proposed machine completely avoids the need of skilled labor which is one of the greatest difficulty and the long time required for the tapping process. In the proposed model each tree requires individual machine which we can fix on the tree for a long term which makes the initial cost of implementation high. The machines are operated at same timewhich reduced the total time of tapping to time required to tap one tree. Another point is that the machine makes a smooth tapping with paper thickness there by increasing the productive life of tree. Its operated using a single switch and completes the entire tapping in one stretch. In this a stepper motor is used to change the everyday position of the blade and a small DC motor with a gear arrangement is used for the fast tapping process. The specially designed shape of the blade provides the removal of cut pieces easier. So the man power is only required for the collection of latex . The necessary programs are done using microprocessor.

Keywords: *Tapping, Latex*

*Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering and Technology, Kuttikkanam, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kanjirappally, Kottayam.

PAPER ID: 272

Nonisolated ZVZCS RPWM dc-dc Converter for PV Systems with MPPT

Deepa K.Suresh*, Surumi Hussainar**

Abstract:

This paper deals with the design and simulation of a simple PV with MPPT using nonisolated ZVZCS RPWM dc-dc converter. Among different MPPT algorithms, incremental conductance method is used. The RPWM dc-dc converter used for the MPPT provide high step-up with less switching losses, also the capacitance in the auxiliary circuit is significantly reduced. The proposed system provide a simple PV system with maximum power extraction for various applications. The system is simulated using MATLAB and the prototype of the dc-dc converter is developed.

Keywords: *Maximum power point tracker, photovoltaic, resonant pulse width modulation, zero voltage zero current switching.*

Reference:

[1] Hohm, D. P. & M. E. Ropp "Comparative Study of Maximum Power Point Tracking Algorithms" Progress in Photovoltaics: Research and Applications November 2002, page 47-62.

[2] BP Solar BP SX150 - 150W Multi-crystalline Photovoltaic Module Datasheet, 2001.

[3] Walker, Geoff R. "Evaluating MPPT converter topologies using a MATLAB PV model" Australasian Universities Power Engineering Conference, AUPEC '00, Brisbane, 2000.

*Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Kuttikkanam, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, FISAT Angamaly, Ernakulam.

PAPER ID: 273

A REVIEW OF THE EFFECTS OF HARMONICS IN POWER SYSTEM

Eldhose Mathew*, Meenu Saji *, Silpa J Vadakkan*, Tomina Thomas**

Abstract:

In our paper it reviews concern about the effects of harmonics in power system. Harmonics are defined as the presence of distortion of voltage and current waveforms. Every system is capable of receiving and creating some harmonic distortion. Malfunctioning of electrical equipment will often occur when there is harmonics in the electrical system. Harmonics have been experienced around a long time but at that time it has less damaging effects. Now a day it is the most important problem in power systems and cause several detrimental effects on power system equipments and loads. This work is done to reduce harmonics and to know more about the effect of harmonics in equipment. This is intended to give an overview of harmonics in power systems and aimed at how to handle harmonics in power system. It is crucial that the work is done to fortify the dependable operation of power system in future.

Keywords: *Harmonic,; Power system, Harmonic distortion, Power factor*

Reference:

[1] IEEE Committee Report: "The effects of power system harmonics on power system equipments and loads", IEEE Trans. on Power Apparatus and Systems, vol. PAS104, N0.9 September 1985, pp.2038-2042.
[2] International Conference on Harmonics in Power Systems, Worcester Polytechnic Institute, Worcester, MA, Oct.,1984.
[3] F.Z. Peng, H. Akagi, A. Nabae, "A new approach to harmonic compensation in power systems", IEEE/IAS Conf.Proc., pp.1107-1112,1990.

*UG Student, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki. **Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering & Technology, Peermade, Idukki.

PAPER ID: 406

AUTOMATIC POWER GENERATION FOR ELECTRIC LOCOMOTIVES USING DFIG

Saptarsi Sarma*, Amit Debnath*, Anindita Deb**

Abstract:

This paper basically deals with power generation for electric vehicles using DFIG. The main advantage is that, it works under operational (running) condition also. The Indian Railways primarily operates electric and diesel locomotives. We introduced doubly fed induction generator (DFIG) on electric locomotives and designed a prototype for propeller installation of DFIG in the locomotives. We use MATLAB for simulation of 1.5 MW DFIG and realize that, DFIG can produce electricity at 1 m/s wind speed also. We want to use that power for charging the batteries of electric train while it is running and deliver the access amount of power to the grid using pantograph. In India, Indian Railway (IR) runs more than 20,000 passenger trains daily. We also calculated that if 10 percent of electric trains are running with DFIG then how much electricity can serve by Indian Railway to whole grid system.

Keywords: *DFIG, Indian Railway, Electric locomotive, pantograph, Grid*

Reference:

[1] S.M. TUPE, D.P. CHAVAN, C.P. AVHAD AND A.K. PATHAK. ''POWER GENERATION THROUGH WIND CREATED BY MOVING TRAIN.'' INTERNATIONAL JOURNAL OF ADVANCE RESEARCH AND INNOVATIVE IDEAS IN EDUCATION. 2(2), 2016, PP. 852-855.

[2] M.M. EHSAN, E.G. OVY, H.A. CHOWDHURY AND S.M. FERDOUS. ''A PROPOSAL OF IMPLEMENTATION OF DUCTED WIND TURBINE INTEGRATED WITH SOLAR SYSTEM FOR RELIABLE POWER GENERATION IN BANGLADESH.'' INTERNATIONAL JOURNAL OF RENEWABLE ENERGY RESEARCH. 2(3), 2012, PP. 397-403.

*UG Student, Dept. of Electrical & Electronics, Techno College of Engineering, Agartala, India.
**Assistant Professor, Dept. of Electrical & Electronics, Techno College of Engineering, Agartala, India.

PAPER ID: 417

Reduced Graphene Oxide/Polyaniline Composite Characterization for Better Performance Supercapacitor Electrodes

Divya George*, Georgekutty James*, Jakson K Manjally*, Joseph Thomas* , Maria K Shine*,
Aryamol K S+, Anish Benny**

Abstract:

The arrival of novel organic and inorganic nanomaterials in recent years, particularly nanostructured carbons, conducting polymers, and metal oxides, has enabled the fabrication of various energy devices with enhanced performance. A coventional method is utilized for the preparation of reduced graphene oxide/polyaniline (rGO/PANI) composite, where ammonium persulfate (APS) is added to the acidic solution of graphene oxide (GO) and aniline monomer and further reduced using hydrazine. Here in-situ polymerization is conducted to polymerize the aniline monomer. An investigation is carried out by varying the amount of GO while keeping amount of aniline constant to obtain the best composition. The characterizations reveal the structural property, purity of the composite, the vibrational and rotational characteristics and further shows proper loading of PANI on rGO. As investigated earlier rGO/PANI composite then to have an energy density of about 13.9 Wh kg-1 and specific capacitance around 600 Fg-1. Therefore electrodes made out of rGO/PANI composite can be considered as a promising milestone for the fabrication of low cost, better performance supercapacitor.

Keywords: *Reduced Graphene Oxide, Polyaniline. Supercapacitor Energy density*

Reference:

[1] H. Gao, K. Lian, Proton-conducting polymer electrolytes and their applications in solid supercapacitors: a review, RSC Adv., 4 (2014) 33091-33113.

[2] H. Wang, L. Pilon, Physical interpretation of cyclic voltammetry for measuring electric double layer capacitances, Electrochim. Acta, 64 (2012) 130-139.

[3] S.K. Kaverlavani, S.E. Moosavifard, A. Bakouei, Designing graphene- wrapped nanoporous CuCo2O4 hollow spheres electrodes for high- performance asymmetric supercapacitors, Journal of Materials Chemistry A, 5 (2017) 14301-14309.

*UG Student, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam. +UG Student, Department of Chemistry, St. Dominics College, Kottayam. **Dean- Research, Dept. of Electrical & Electronics, Amal Jyothi College of Engineering, Kottayam.

PAPER ID: 418

Assessment of Classification Algorithms Using Low Level Features For MIR

Ojasvini*, Piyush*, Nitesh*, Mayur*, Mrs. Narina Thakur*

Abstract:

Multiple low-level audio features are extracted from a dataset of 1000 tracks and which are then classified into 10 genres using 12 different classification approaches to and validated using 5-fold cross validation to achieve minimal error rate and maximal classification accuracy. The extracted features of two kinds are used, one that was pre-extracted, from the data set which contains features like Mel-frequency cepstral coefficients, timbre and rhythmic features and the other kind are the self-extracted features that include chroma, MFCC, and zero crossing rate.

Keywords: *Feature extraction, audio classification, genre, classification accuracy, algorithms*

Reference:

[1] Chathuranga, Y. M. D., and K. L. Jayaratne. "Automatic music genre classification of audio signals with machine learning approaches." GSTF Journal on Computing (JoC) 3.2 (2018).

[2] Drinkify.org, 2011. [Online]. Available: http://drinkify.org/. [Accessed: 11- Apr- 2019].

[3]"Pandora", Pandora.com, 2000. [Online]. Available: https://www.pandora.com. [Accessed: 11- Apr- 2019].

*UG Student, C.S.E. Department, Bharti Vidyapeeth college of engineering, New Delhi.

PAPER ID: 501

DISTRUBUTED GENERATION IMPACT ON RURAL DISTRIBUTION NETWORK –A CASE STUDY

Sunil S K*, Vinod kumar.S**

Abstract:

This paper proposes the   analysis of a rural distribution network of rural feeder which is often challenged by voltage regulation problems, energy loss, & peak loading conditions, distributed generation like solar PV ,at optimal locations on distribution feeders, may enable energy loss reduction and voltage profile improvement. A proposed methodology is developed for deciding the appropriate sitting and sizing of distributed generation in rural distribution network; simulations are performed in power world simulators which quantify the loss reduction and system improvement by having distributed generation. I have also examined the climate and metrological condition of rural area for solar radiation assessment .Finally the analysis reveals the improvement in voltage profile, significant energy loss reduction in distribution network and an increase in network capacity of rural feeder.

*UG Student, Dept. of Electrical & Electronics, New Horizon College Of Engineering Bangalore.
**Assistant Professor, Dept. of Electrical & Electronics, New Horizon College of Engineering Bangalore.

PAPER ID: 502

Distributed Parameter-Based Voltage Stability Index for Reactive Power Management in Deregulated Electrical System

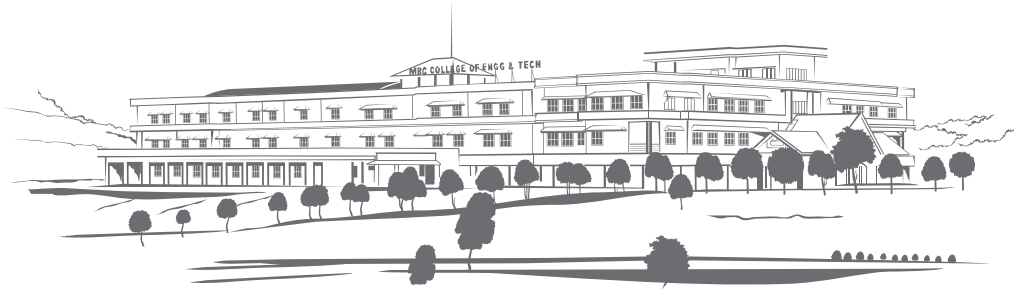Fini Fathima**, Resmara S**

Abstract:

During past two decades electric utilities have faced the upheaval of moving toward deregulation. It has always been its ambition of creating a clear structure in which rivals are allowed to do free enterprise in trading of electricity. It has always been its ambition of creating a clear structure in which rivals are allowed to do free enterprise in trading of electricity. Accordingly, in this new era economical rules and electricity market legislations have a big effect on secure operation of power systems. This means that, presense of a market independent entity is vital while it should only be in charge of security and stability of power system operation.Reactive power is one kind of ancillary service that have significant effects on active power trading indirectly. Reactive power is utilized for different purposes e.g voltage profiles amelioration, power loss reduction and lessening occupied capacity of the transmission network. In general, a good reactive power management system increase the performance of transmission lines as unique paths for physical operation of electric power transactions. This paper proposes a distributed parameter-based voltage stability index (*DPVSI*) for assessment of voltage stability of the reactive power management in the de regulated system. Proposed index incorporates the effects of distributed parameters of transmission line to predict voltage collapse. Critical loading of different lines is determined by raising active/reactive loading of different lines till the index reaches its critical value. Different contingencies are also ranked on the basis of index. Reactive power margin of the system is measured by mapping the index value in terms of reactive power margin of the system. The proposed index is investigated on IEEE 30-bus and 118-bus test systems to prove its potential.

Keywords: *Voltage stability index, voltage collapse, contingency analysis, line outage, distributed parameters*

References

[1] Ajjarapu, V. (2007). *Computational techniques for voltage stability assessment and control*. New York, NY: Springer Science and Business Media.

[2] Pradeep Singh (2019), Distributed parameter-based voltage stability index for identification of critical lines and voltage stability margin in power system, Research Article

**Assistant Professor, Dept. of Electrical & Electronics, Mar Baselios Christian College of Engineering and Technology, Kuttikkanam, Idukki.

MAR BASELIOS CHRISTIAN
COLLEGE OF ENGINEERING & TECHNOLOGY
KUTTIKKANAM, PEERMADE

NATIONAL CONFERENCE ON RECENT ADVANCES IN ELECTRICAL & ELECTRONICS ENGINEERING (NCREEE '19)

Organized by
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

In Association with
KSEBEA

IEEE **PES**
Power & Energy Society™