

# **SONA - EDISON Pages**





# SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS)

# DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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## **The Gravity Behind**



I am gratified to know the Department of Electrical Engineering is bringing out an issue of their technical magazine. This is a productive technical material that will be subsidiary skill- developing tool for the students. I wish the Electrical Engineering Department a very big success in all their ventures. I also applaud the coordination and efforts behind the team bring out this issue. I wish them all success.

Dr. S.R.R. Senthil Kumar, Principal

I am exhilarated in establishing technical magazine of our Department, which is a reference of the most recent trends and activities in Electrical and Electronics field. This magazine should be good source of guidance for faculty and students in choosing activities of their choice in their future for building their careers.

Dr. S. Padma, HOD/EEE



# Vision - EEE

To become a front-runner in bringing out globally competent electrical and electronics engineers, innovators, researchers, and entrepreneurs and thereby contribute value to the knowledge-based economy and society.

# **Mission - EEE**

- To offer good quality Under-Graduate, Post-Graduate and Doctoral programmes in electrical and electronics engineering
- To provide state-of-the-art resources that contribute to achieve excellence in teaching-learning,

- research and development activities
- To bridge the gap between industry and academia by framing curricula and syllabi based on industrial and societal needs
- > To provide suitable forums to enhance the creative talents of students and faculty members
- To enable students to develop skills to solve complex technological problems of current times and also provide a framework for promoting collaborative and multidisciplinary activities
- $\succ$  To inculcate moral and ethical values among the faculty and students.

# **Students Technical Projects**

## Dynamic clustering and scheduling for vehicle to vehicle communication

Elakkiya Vadhana M S & Team -IV Year EEE students developed a vehicle-to-vehicle (V2V) communication for data exchange among cars travelling in opposing directions in highways. This study is focused on examining the peculiarities of data services in such a situation and looking into fresh ways to improve system performance as a whole. Secondly using test signal-to-interference-noise ratio results the of V2V communication, the theoretical analysis of the possibility of effective data exchange among vehicles travelling in opposing directions. Moreover, a cluster association method is created to allow cars to join or leave a cluster on the fly based on their actual speeds.



### **Smart Gardening with Insect trapper using IOT**



Dr. S. Vijay Shankar & Student team developed Solar Insect Trapper - a solar energy-based insect trapper can trap many pests and helps farmer to cultivate more quality and quantity of crops since farmers faces the problems of various types of pests that harm crops right from sowing till the crop harvested. This project uses UV LEDs were safer than using ordinary fluorescent lamps. Moreover India is a tropical country, solar power is readily available and also it requires less maintenance. The device seems promising to farmers since it has been capturing adults of many pest, borers, and flies thereby reducing the dependence on bio pesticide usage to the tune of 50%.

### **Wireless Controlled Humanoid Robotic Arm**

• A system that can be remotely managed, has a high degree of maneuverability, and can be precisely controlled in every movement. For this project, the operator will use a wireless



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controller on each hand that is installed on a pair of gloves. The driver IC, which controls the movement of the arm, is controlled by the microcontroller through an interface between the RF receiver and the latter.

• The transmitter circuit transmits instructions to the receiver circuit, which tells the robotic arm whether to move in any direction to grasp or release an object. The operator may control the motion of the robotic vehicle using motions made with the other hand.

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## **Development of Robotic Arm using Raspberry Pi Module**

Aparrna M & Team of IV year EEE developed a robotic arm in which a sensor placement in robots is difficult to establish and with high risk. A motor drive coupled for knee movement obtains self-estimation algorithm to drive parameters of BLDC through sensor-less estimation method. An experimental validation is incorporated with high power density motor with controller.



# Power Harvesting System Using THSEAF with P+R Controller to Improve Grid Current Quality



PG-Power System Engineering Scholar- Praveena S developed a Transformer-less Hybrid Series Active Filter (THSeAF). THSeAF is modeled and control strategies with renewable energy resources to enhance the power quality. The converter scheme has P+R topology in which the common mode leakage current is minimal.

#### Intelligent eye for visually impaired people with self-generation



A concept for creating a clever system that can help those who are blind with daily tasks. Those who are blind confront a variety of difficulties. One of the biggest obstacles is finding a way to go from one area to another without help. Additional difficulties

include having trouble identifying individuals and spotting barriers. The gadget overcomes the difficulties in creating the device by combining technologies that are now available and integrating them into a multifunctional device that can be used by the sight handicapped.

## **Design of Wireless Sensor System for Neonatal Monitoring**

The use of wireless sensor technology and the benefits it will inevitably bring to the monitoring and treatment of newborns in neonatal intensive care units (NICU). Based on embedded wireless sensor systems, a wireless transceiver module, an electrocardiography (ECG) readout board, and a software interface were built. The wireless system is intended to be compatible with non-invasive monitoring systems, including a smart neonatal jacket that has been created.





#### **Mango Picking using MATLAB**

This project details the creation of a MATLAB simulation control and framework for testing sensors and manipulators during robotic mango harvesting. The goal was to create a fully realistic environment for simulation so that control algorithms could be easily tested and improved without endangering the real robot or the equipment it. The control method in MATLAB employed data from simulation trials as inputs, and the outputs were communicated back to the real robots and the simulated

### **Motor Olympics'19**

- The students have to recall the working principle of a motor and make a model with the given materials.
- This year, it was conducted on 23.02.2019 (Saturday) at power electronics lab.



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## **Testing of ageing and Humidity in Silicone Rubber Specimen - SONA PERT**

R&D centre successfully conducted ageing and humidity testing in Silicone Rubber Specimen The corresponding transverse relaxation time drop, the amount of H atoms that enter low bond energy states, and the resistance to corona ageing all rise as silicone rubber ages. The outcomes can be used to diagnose problems and to produce composite insulators in application of engineering products and components.



#### Knowledge sharing of Embedded & Electronics Programming



Feb.11,2019-Workshop on Embedded & Electronics Programming delivered by Ajay Singh Dahiya from Tricog, Bangalore.

- Embedded system is the core of every intelligent device all the automated electronics gadgets are having one or another form of embedded systems responsible for their intelligent functioning.
- Electronic devices are rapidly finding applications in many of the areas, from simple coffee vending machines to space science to environmental friendly products such as big belly etc.

#### **Techno trends on Technical Conference RTES'19**

Department of Electrical and Electronics Engineering and the IEEE students branch of Sona College of Technology, Salem organized a National Tends Conference on "Recent 1**n** Electrical Systems"- RTES'19 on 01.03.2019. Shri. M. Narayanan Namboodiripad, Deputy Director. The key intention of RTES is to provide global opportunities for global participants to share their technical ideas, research experience in person and a forum to take new path for many young budding technical engineers to discuss the challenges and unsolved technical and social problems.



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# **Dissemination of Technical Knowledge through Publications**

Author	Title of Paper	Name of the Journal	Index	Technical novelty and Major contributions
S. Padma, Professor/EEE	Detecting abnormalities of video gaming kids by developing Lab view based standalone system	Journal of medical imaging and health informatics	SCI	This paper focus on developing the lab view based stand-alone system for monitoring the kids and identifying the abnormalities with the help of the EMG and EEG.
S.Chandrasekar Professor/EEE	Influence of SF6 /N2 Gas Mixture Ration on the Lightning Streamer propagation Characteristics of 2kV MV Circuit Breaker	Journal of Electrical Engineering & Technology	SCI	The positive and negative polarity LI tests are carried out on 22 kV medium voltage circuit breaker filled with SF6/N2 gas mixture at different gas pressures (1-5 bar) and at different gas mixture ratios.
R. Arulmozhiyal Professor/EEE	Investigation on Solar PV generation and design of switched reluctance motor for Smart Agriculture actuation system	Journal of Brazilian Technology	SCI	This paper presents standalone solar photovoltaic (PV) powered fed actuation system employing a switched reluctance motor (SRM) particularly used in remote and rural areas.
K. Krishnamoorthi Associate Professor/EEE	Low area ASIC implementation of LUT–CLA–QTL architecture for cryptography applications	Wireless Networks	SCI	A new ultra lightweight BC is implemented which consists of 64-bits BC QTL that supports 128 or 68-bits keys.
R. Shivakumar Professor/EEE	Design and Implementation of Crow search algorithm tuned MPPT controller for Grid connected PV system	Journal of Electrical Engineering	Scopus	In this work a Crow Search Algorithm (CSA) based Maximum Power Point Tracking (MPPT) scheme for solar PV system integrated with utility grid.

#### **Next generation E-Vehicles workshop**



Work shop on "Electrical Vehicles", 2019. Electric vehicles can reduce fuel costs dramatically because of the high efficiency of electric-drive components.

#### **FDTP on Power System Analysis**

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May 13, 2019, Power System Analysis is to design complex power system network consisting of generators, transformer and transmission lines and compensating devices. The technical topics such as power flow analysis, symmetrical and unsymmetrical analysis, short circuit analysis and stability analysis is discussed.

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## **Review on Latest Technologies on Machine Learning and Robotics**

Machine code that mimics human and animal intelligence is at the heart of artificial intelligence (AI). Professionals in artificial intelligence create algorithms and programme machines to do human-like activities. Artificial intelligence (AI) is already widely used to detect credit card fraud, identify disease outbreaks, and improve satellite navigation. Reliability and safety for intelligent autonomous systems,

AI for digital manufacturing, and trustworthy and explainable AI and machine learning are all purported AI breakthroughs. Robotics is a field that studies and develops robots in order to make life easier. Robotics is a multi-disciplinary field that includes computer science, electrical engineering, and mechanical engineering. Artificial intelligence, machine learning, and other technologies are used in robotics. In industries such as manufacturing, farming, and food preparation, robots attempt to improve safety and efficiency.

#### Career Opportunities in Robotics:

- ✓ Robotics Engineer
- ✓ Algorithm Engineer
- ✓ Data Scientist
- ✓ Software Engineer
- ✓ Robotics Research Scientist
- ✓ Cloud Engineer

#### Career Opportunities in AI:

- ✓ Machine Learning Engineer
- ✓ Senior Data Scientist
- ✓ Artificial Intelligence/Machine Learning Research Scientist
- ✓ Deep Learning Engineer
- ✓ Algorithm Engineer

## Learning Experience of MATLAB/SIMULINK and ARDUINO



# 24<sup>th</sup> & 25<sup>th</sup>2018 July,-

Enthu Technologies Coimbatore given training on MATLAB/SIMULINK and ARDUINO Training support package for Arduino lets you write MATLAB programs that read and write data to your Arduino and access



connected devices such as motors, LEDs, and I2C devices. Because MATLAB is a high-level interpreted language, prototyping and refining algorithms for your Arduino projects is easy, and you can see results from I/O instructions immediately, without recompiling. MATLAB includes thousands of built-in math, engineering, and plotting functions that you can use for your Arduino programming.

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#### Industrial Visit to Swelect Energy Systems Company

- SWELECT operates a 140 MW class 100,000, dustfree, clean-room, world-class PV module HHV Solar Technologies (HST) manufacturing plant with R&D facility at Bangalore.
- The Solar PV product portfolio comprises of High Quality – High Efficiency Solar PV modules in various Power ratings with International Certifications and compliance to BIS & IEC Standards.



#### Evaluation of Voltage Stability Index in a Distributed Photo Voltaic System-DST – SERB Fast Track Young Scientist Dr.M.Senthil Kumar, Professor / EEE

- An integrated system utilized for finding the optimal bus locations for the multiple Distributed Generation unit installation with solar PV cells.
- The optimal size of DG units at the identified bus locations are computed using ALO algorithm by minimizing the total real power loss of distribution network. The minimization of total real power loss will lead to considerable enhancement in voltage profile supplied to load.



#### Motors & Motor drives three Phase BLDC Motor Prof. N. Kannan, Head / SONA-SPEED R&D



Permanent Magnet duplex Stepper Motor in which the rotor is made of ferrite or rare-earth material which is permanently magnetized. The stator stack of phase b is staggered from that of phase a by an angle of 90° elect. When the phase a is excited, the rotor is aligned the phase b is also excited, the effective stator poles shift counterclockwise by 22 1/2 causing the rotor to move accordingly. In motor a review of position and speed sensorless methods for controlling Brushless Direct Current (BLDC) motor drives, including the background analysis using sensors, limitations and advances. The performance and reliability of BLDC motor drivers have been improved because the conventional control and sensing techniques have been improved through sensorless technology.