

**June
2020**

A Technical Magazine

SONA COLLEGE OF TECHNOLOGY(AUTONOMOUS)
DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING

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Message



EEE department publishes technical magazine that represent the department's attitude and goals and technical contributions of staff, students, and other team members. I'm happy to congratulate the team for producing a top-notch technical magazine in consecutive years. All students and faculty members would be inspired and motivated to contribute even more to the upcoming editions after reading this technical magazine.

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

I am in immense pleasure coming up with another issue of EEE department technical magazine. This issue has more concentrated technical information to the student community and quenches their thirst for knowledge updating. I strongly believe that the informative articles & innovative ideas presented in the magazine will be appealing and useful to the readers.

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
- To inculcate moral and ethical values among the faculty and students.

PEOs OF B.E: ELECTRICAL AND ELECTRONICS ENGINEERING

- Apply their knowledge and skills to provide solutions to electrical and electronics engineering problems in industry and governmental organizations or to enhance student learning in educational institutions.
- Work as a team with a sense of ethics and professionalism, and communicate effectively to manage cross-cultural and multidisciplinary teams.
- Update their knowledge continuously through lifelong learning that contributes to personal and organizational growth.

Students Technical Projects

Smart Water Leak Controller in Metro Water Supply Lines Using IOT

Unwanted water leakage beneath the underground pipelines is almost always pertaining in drinking water supply networks. This system contains a leakage detection and automatically closes the solenoid valve for to prevent the over leakage of water and alert using IOT module according to sensor information. By using GPS location to detect where the leakage takes place based on fill in the water tank by using android application.



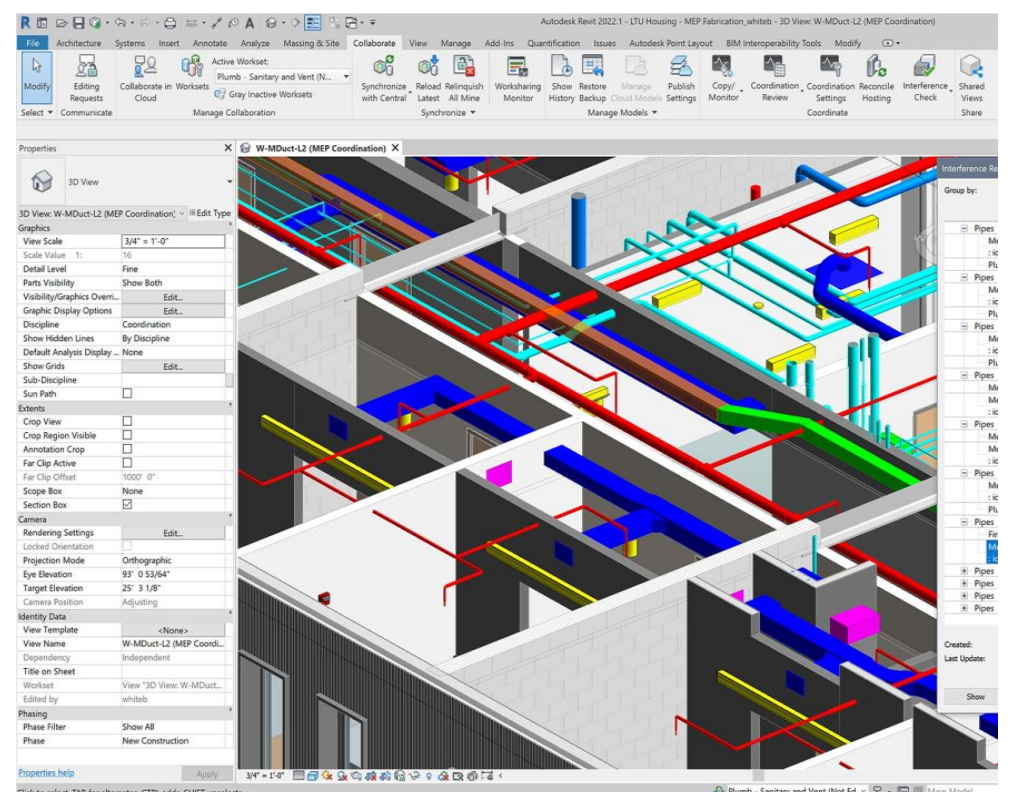
Training on ARM Processor



- ARM is an acronym used for Advanced RISC Machines as these are a family member of those CPUs which are based on RISC architecture. More simply, Advanced RISC machines have created the architecture of ARM processors thus called so.
- These processors offer architectural simplicity due to which it exists in small size, is less complex, and thereby offers high performance when implemented within a system.
- Training was conducted on Oct.16.2019 at power electronics lab.

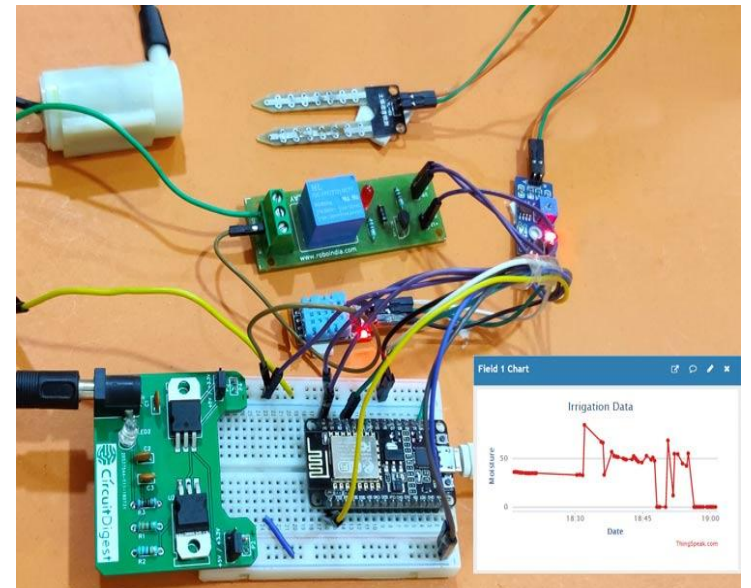
EEE Department-Introduces-MEP

MEP facilitates the development of precise 3D coordination models for plumbing, electrical, HVAC, fire protection, and mechanical components. All project participants, including builders and contractors, are able to quickly interchange and discuss their models with one another on the digital platform in Revit Software. The main difference between AutoCAD MEP and Revit MEP is BIM and Computer-Aided Design (CAD). Revit is a robust design and documentation platform.



Smart Irrigation System Using Intelligent System –Workshop on 5th Feb 2020

Smart agriculture, in general, refers to the incorporation of new technologies in crop management to make remote monitoring, resource optimization, and the automation of the systems involved easier. This workshop related to the concept of intelligent irrigation system which consists of adding intelligence to automatic irrigation systems, either using intelligent control techniques.



CONSILO - EEE



- CONSILO – EEE project contest on 6th March 2020,
- Innovation, Research and Development activities to stimulate young minds is the need of the day amongst the budding engineers.
- This event will help to identify the next generation innovators and introduce to the marketplace for commercialization to realize ‘Make in India.’
- Enable students to exhibit their design

International Conference-POWERCOIN-2020

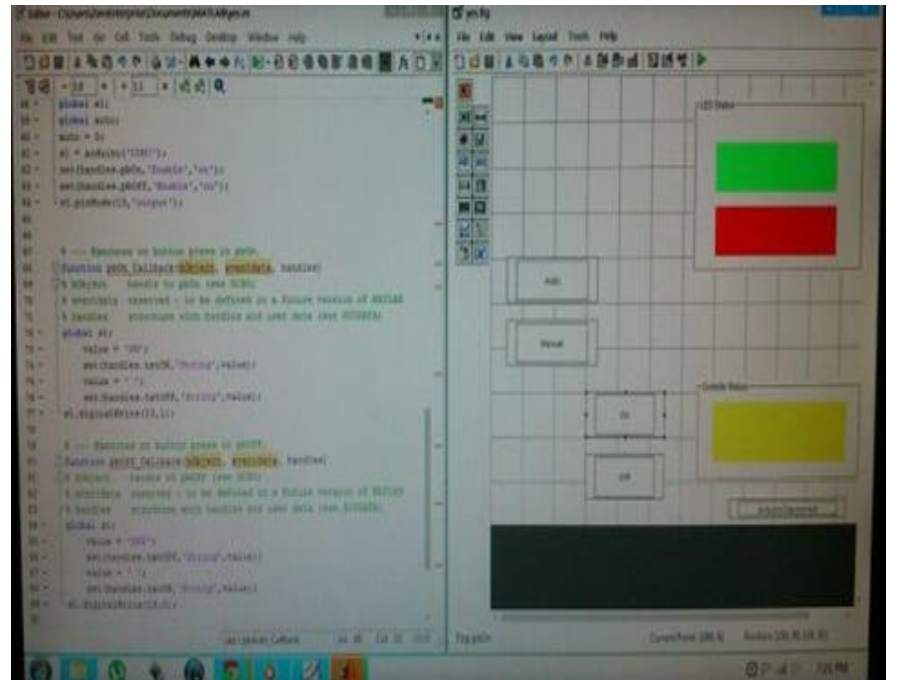


International Conference on (POWERCOIN'20) and Chief guest are Dr. Mazlan Abbas CEO, FavoriotSndbhd, Malaysia and Mr. PrakashBhattarai R&D Test Engineer in Carbon Track PTY Ltd-Hawthorn,VIC, Australia.

Industry 4.0 has been designated as a mission. In Indian manufacturing, Industry 4.0 has reached a tipping point. Emerging markets, such as India, have accelerated digital transformation in their manufacturing sectors. It is time for industry stakeholders to see the pandemic as a chance to implement Industry 4.0 and its initiatives.

Workshop on MATLAB Lab & Arduino Training, 26th -28th May 2020

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. 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.



Energy Auditing & Importance



- The routine energy audit helps in reducing the carbon footprint of an organization with systematic steps and enhances energy efficiency.
- The energy audit brings a detailed report with in-depth analysis to identify the diverse techniques of energy-saving on the site.
- The audit report helps you understand the gaps, minimize energy exploitation, and promote calculated consumption.
- An energy audit analyzes and detects the safety concerns with the existing electrical setup, wiring system, ventilation, etc. It is an effective way to make the workspace secure.

CTPT Caliber –SONA PERT

- Instrument transformers such as, current transformers and potential transformers are widely used in electrical grids to provide signals to meters and protective relays. Therefore, accuracy testing of current and potential transformers is important for applications in the area of power system protection and metering.
- SonaPERT's CTPT Caliber Model CTPTC-10.3 is a unique, compact, lightweight, innovative PC based system developed to meet the highest standards for performing ratio and phase angle error evaluation of both current and voltage transformers in a single test set.



Dual Power Generation Alternator-Dr. D. Prasad & Team

In an emergency vehicle having dual batteries, one of which is employed for supplying power to the electrical system of the vehicle chassis and the other of which is employed for supplying power to the emergency equipment, dual alternators driven by the engine are provided for charging the batteries.



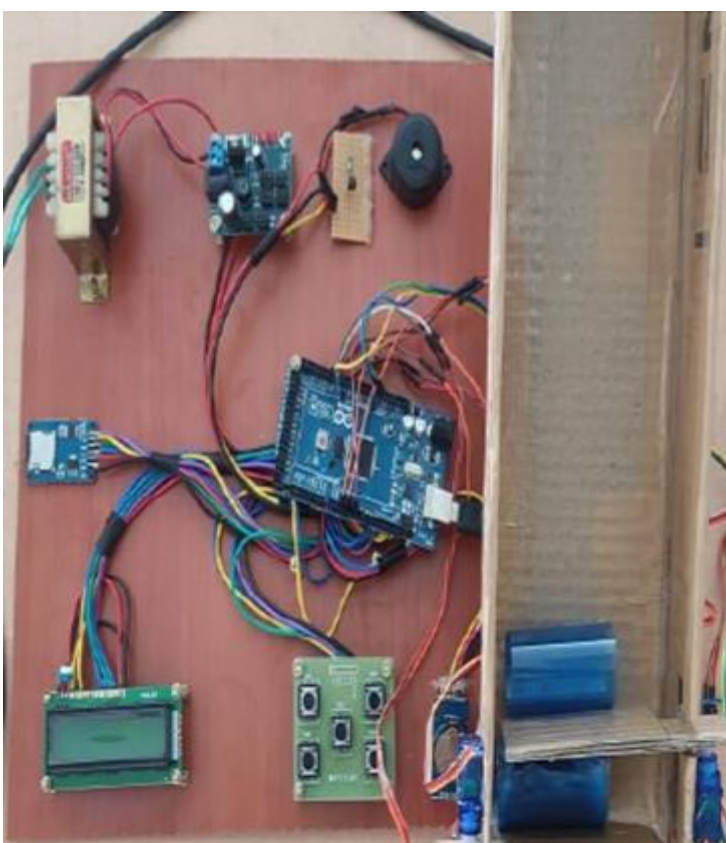
COVID Product



Automatic Hand Sanitizer

- This technology product developed to avoid Covid-19 contagion. Sensor Function – Fully Automatic and touch free operation to avoid foreign bodies' infection.
- Fittings - Operated by wall mounted roof, easy to install and safe to use. More Convenient – Easy to top filling and be hung on the wall, Single out approximately 0.5 ml, avoid unnecessary waste, non-drip design.
- Multifunction – Suitable for Home kitchens, Bathrooms, Offices, Kindergartens, Schools, Hotels etc.

Design and Development of Medicine Vending Machine for Covid-19



Patients forget to take the medicine at the required time of medicines. And sometimes patient also forgets which medicine He/She have to take at required time. And it is difficult for Doctor to monitor patients around the clock. To avoid this problem, we have made this medicine reminder system for patients using IOT enabled controller based system.

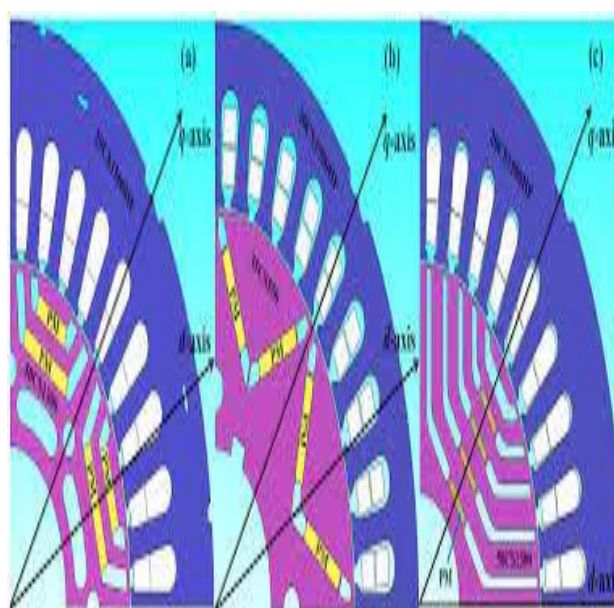
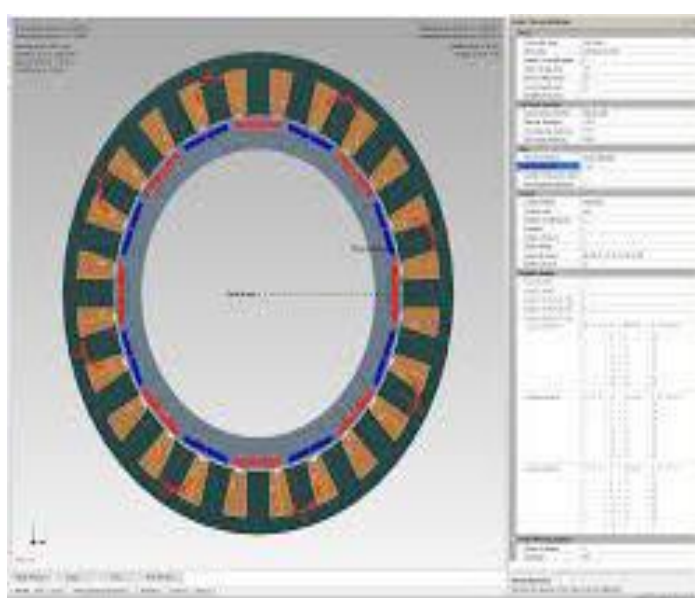
It is extremely beneficial during pandemic situations with a high risk of virus propagation, such as COVID-19 and other pandemic suction.

Dissemination of Technical Knowledge through Publications

Author	Title of Paper	Name of the Journal	Impact Factor	Indexed	Technical novelty and Major contributions
S. Padma, Professor/EEE	Implementation of PSOANN Optimized PI Control Algorithm for Shunt Active Filter	Journal of Computer Modeling in Engineering & Science	0.72	SCI	The technical work proposes the optimum controller for shunt active filter (SAF) to mitigate the harmonics and maintain the power quality in the distribution system.
	Stability Enhancement of Power System with UPFC using Hybrid TLBO Algorithm	Journal of Scientific & Industrial Research	0.42	SCI	This paper proposes an optimal power flow analysis using a Modified Teaching Learning Based Optimization (MTLBO) algorithm followed by an optimal placement of UPFC in the system.
S.Chandrasekar Professor/EEE	A Study on the Influence of Sio2 NanoParticles on the Failure of XLPE Underground Cables due to ElectricalTreeing	Journal of Electrical Engineering & Technology	0.47	SCI	In this research work, electrical treeing analysis of Cross Linked Polyethylene (XLPE) material filled with pure nano silica particles has been carried out
	Investigation on Novel Carbon Quantum Dots Covered Nanofluid Insulation forMedium Voltage Applications	Journal of Electrical Engineering & Technology	0.47	SCI	The present study investigates a novel nanofluid insulation prepared using carbon quantum dots (CQD) which is used for the surface treatment of SiO2 nanoparticles added to commercially available mineral oil.
R. Arulmozhiyal Professor/EEE	An Improved Self-Tuning ControlMechanism for BLDC Motor using Grey Wolf Optimization Algorithm	Electrical Engineering	0.32	Scopus	This paper investigates modeling and simulation of BLDC motor with an optimization algorithm for self-tuning parameters in an unknown alleyway. Grey wolf algorithm (GWA), an intelligent control algorithm is developed with the behavior of a wolf while hunting the pathways.
K. Krishnamoorthi Associate Professor/EEE	Design and Implementation of Bidirectional Converter for Electric and Hybrid Electric Vehicle	Journal of Electrical Engineering	0.28	Scopus	A novel power electronics energy management system for hybrid electric and plug-in hybrid electric vehicles (PHEV) is designed using a bidirectional switched capacitor (SC) DC/DC Luo converter.
S.Padma, Professor/EEE,	Optimization of harmonics with active power filter based on ADALINE neural networ	Journal of Microprocessors and Microsystems	1.61	SCI	This research develops efficient technique for harmonic estimation and detection of the renewable wind energy resources and elimination of these harmonics will also be done accordingly for getting desired output from wind energy.
S.Chandrasekar Professor/EEE	Investigation of Electrical Tree Growth Characteristics in XLPE Nano-composites	IEEE Transactions on Dielectrics and Electrical Insulation	0.76	SCI	The use of Nano composite cross linked polyethylene, XLPE, is investigated in this paper. Experiments of electrical tree growth on silica-nanostructured XLPE specimens, during which the time behavior of partial discharges is recorded, are presented and discussed.
R. Arulmozhiyal Professor/EEE	Investigation on Solar PV generation and design of switched reluctance motor for Smart Agriculture actuation system	Journal of Brazilian Technology	0.62	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.

Dr. M. Senthilkumar Professor/EEE	Optimal Location and Sizing of Renewable Energy based Distributed Generation Units in a Radial Distribution Power Network using Ant Lion Optimization Algorithm	Journal of Electrical Engineering	0.78	SCI	This paper introduces an ant lion optimization algorithm (ALOA) for identifying suitable location and capacity of renewable energy based DG units for different distribution network systems.
R. Shivakumar Professor/EEE	Stability Improvement in Multi Machine Power Systems using Nature Inspired Algorithms	TEST Engineering and Management	0.87	Scopus	In this work a design was performed with conventional method, Genetic Algorithm and output is evaluated against by Grasshopper Optimization Algorithm output to get fast response from Power System Stabilizer in order to maintain the power system with dynamic stability.

Motor Design for Electric Vehicle Through MagNet Software

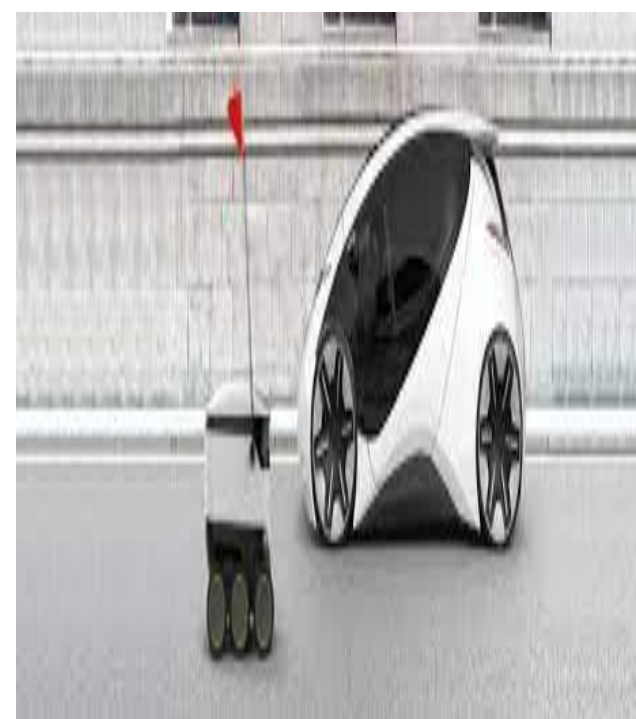


MAGNET software is a powerful electromagnetic field simulation solution for performance prediction of motors, generators, sensors, transformers, actuators, solenoids or any component with permanent magnets or

Webinar on Robotics Systems for E Mobility

June 27th, 2020, Robotics Systems for E mobility workshop – lecture delivered by Rajappan Rajkumar, Hilmil Solutions Bengaluru.

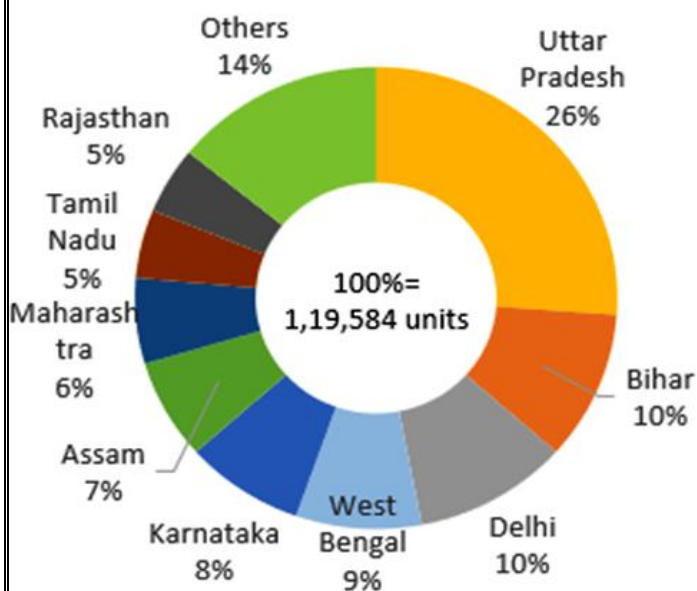
- Workshop focus on to design robot bodies and behaviors that recruit limbs and more general appendages to apply physical forces that confer reliable mobility in a complex and dynamic world.
- We develop an approach to composing simple dynamical abstractions that partially automate the generation of complicated sensorimotor programs.



Electric Vehicles and Its Sustainability in Future

Dr. C. B. Venkatramanan, Associate Professor/EEE

Region-wise registered EV sales -



Electric vehicles are significantly expanding as technology in the electrification of two- and three-wheelers, buses, and trucks develops and the market for them expands.

- Production of electric vehicles surpassed 2.1 million globally in 2019 and increased by 40% over the previous year. In recent years, the introduction of electric vehicles has been greatly aided by ambitious policy pronouncements.
- Government of India has made a clear transition from direct subsidies to policy initiatives that support the car industry and customers in the transition in a way that is economically viable for governments, such as mandates

Role of electrical engineers in the development of electric vehicles

Electrical and Electronics engineers design, develop, test, and supervise the manufacture of electrical components and perform many technical contributions in EVs system.

- Configure the processor, controller and memory along with their associated “building blocks.”
- Power electronics section with thermal-management engineers design climate control inside the EV as well as controls for heat dissipation on electronic components.
- Electromagnetic control provides techniques to prevent EMI from affecting internal systems in the EV as well as external systems in other equipment.
- Lighting engineers design the EV’s internal and external lighting, primarily using LEDs.
- Test engineers checkout the EV’s hardware and software to ensure all systems are operating properly.
- Test instrument engineers design instruments employed to test various functions on an EV. These instruments might be used on the factory floor or at a car dealer’s repair facility.

Electronic BLDC Drive for 8 kW Hubless Thruster Underwater Hydrodynamic BLDC Motor

- BLDC Motor Drive version 16.1, developed by SonaPERT R&D Centre, is an electronic drive used to control the underwater submersible BLDC motor which is connected with remotely operated vehicles (ROV) under the sea for deep sea mining operation.
- This drive can operate any BLDC motor upto 8 kW power rating comfortably. It is provided with over current, over temperature protection. User interface is given through Keypad by which operator can set the required acceleration/deceleration settings, speed commands and direction of rotation.



Ironless BLDC Motor for Laser Doppler Velocimeter SONA-SPEED, R&D

This product is an example of Indigenous technology development of space grade motors. This ironless brushless dc motor is developed for Laser Doppler Velocimeter mechanism of chandrayaan-1 technology development mission done by Laboratory for Electro Optics Systems LEOS, ISRO, Bengaluru.



Digital optic warp, weft stop motion and counter SONA PEDAC R&D



The product relates to the field of fabric production or weaving. It is an attachment designed for power looms that will help to reduce the weaving strain of loom operators.

This is composite product that offers warp and weft pick counter that can be used in shuttle based power looms. If a warp threads breaks or overlaps another or the weft pirn is about to exhaust itself of thread this device will stop the machine through electromagnetic actuated brake, with a display of the type of fault and sound an alarm.

The pick value is stored in an internal memory during power failure and continues the count when power comes again.
