SONA COLLEGE OF TECHNOLOGY

SONA - EDISON Pages

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Electrical Department In SONA

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June 2022

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A Technical Magazine

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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Principal's Message

It gives me an immense pleasure to note that the Department of Electrical and Electronics of Sona College of Technology is bringing out the annual departmental magazine. "Learning is a continuous process from the minute we are born, until we die." This magazine provides a platform for every student to develop his learning skills. I congratulate the HOD,Teaching and non-teaching staff and students of the Electrical and Electronics department for bringing this edition of Magazine. Wish you all the best.

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

HODs Message

Over the years the Electrical and Electronics magazine has provided an opportunity for students and faculty members to portray their topics of research interest, outcomes and share their ideas. Academic and research activity of department is continuously geared up and monitored to cope-up with emerging trends of technological development and innovations. This magazine contains new department vision and mission statements which is updated on December 2021. It will be a good source of guidance for faculty and coming batches of students in choosing activities of their choice in their future for building their carrier.

Dr. S. Padma, HOD/EEE

About Sona

Sona College of Technology (SCT) is established in the year 1997. It is one of the nationally ranking Autonomous self-financing Institutions founded by the Visionary Late Mr. M.S. Chockalingam Chettiar.

Vision - EEE

To be a leader in electrical and electronics engineering education and training by producing globally competent graduates who excel in their chosen careers and are successfully involved in innovative research and entrepreneurship with a strong commitment towards societal development.

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Mission - EEE

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M1) To offer undergraduate, postgraduate, and doctoral programmes in EEE through formal, non-formal, part-time and full-time delivery modes.

M2) To provide state-of-the-art resources that contribute to the achievement of excellence in teaching-learning and research & development activities.

M3) To organize faculty development programmes in need-based areas to enhance their capability in teaching, publishing research papers in peer reviewed journals, filing patents and for their overall career enhancement.

M4) To provide special learning opportunities and a conducive environment for students to enhance their skills in technical, co-curricular activities, extra-curricular activities, entrepreneurship, soft skills and personality traits.

M5) To enhance the research facilities, training, and consultancy services to bridge the gap between industry and academia.

M6) To offer continuing education and need-based skill development programmes to the students for sustainable improvement and development of the society.

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Students Technical Projects

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Design of reconfigurable DC motor drive with auto synchronisation

- Praveen Kumar E, Sri Hari K, Periyasamy S, and Manoj R have designed a reconfigurable DC motor drive with auto-synchronization. The project has the potential to be used in a variety of applications, including agriculture, e-bikes, and e-cars.
- The reconfigurable DC motor drive with auto-synchronization is a system that allows the user to change the motor configuration based on the specific application.
- The system also includes a microcontroller-based control unit that allows the user to monitor and control the motor's operation.
- In e-bikes, the system can be used to provide an efficient and reliable motor drive that can help to reduce the carbon footprint of transportation. In e-cars, the system can be used to provide a robust and reconfigurable motor drive that can be optimized for different driving conditions.
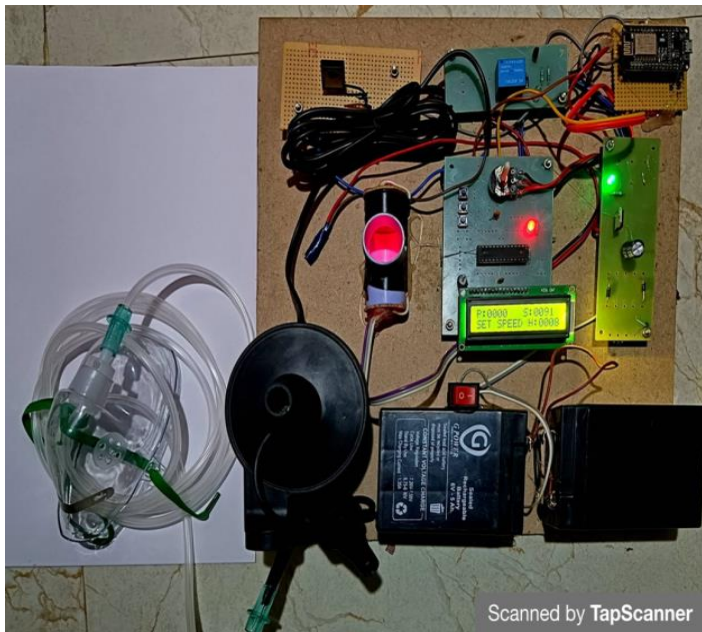
Without load   With load below 6 amps

Development Of Automatic Ventilation System For Hospital Application

Dharshanramkumar R & Team of IV year EEE developed a low cost ventilator. A low-cost ventilator is made using free licensed design and freely available components that are generally not expensive. These types of ventilator can be used in manual and automatic mode easily to deliver the air into the patient body. This project has proven to be a viable option to achieve low-cost and portable ventilator technology.

Energy meter monitoring using IOT

Mukesh Raj & Team of IV year EEE developed a energy meter monitoring using IOT. Electricity can be produced through many ways which is then synchronized on a main grid for usage. It is used to monitor units consumed and transmit the units as well as cost charged over internet using wi-fi connection.

Advanced Diploma in Electric Mobility and Smart Systems

Rise in substantial operating and maintenance cost savings is expected to significantly increase the demand for electric mobility thereby supporting the market growth.

Electric vehicles depend on electricity to replenish their batteries rather than using fossil fuels such as petrol or diesel. With the increasing number of EV battery charging stations emerging, it is now more convenient for consumers to charge their batteries at a local station rather than stand in line at a CNG station or a gas station. The segment's growth can be attributed to the rising sales of electric two-wheelers as more customers choose electric transportation for both commuting and relaxation

Innovative Technical Project Exhibition - 2022

The event was held in the EEE Laboratories and featured innovative projects from the students. The exhibition was divided into two categories, with different themes for each category. Second-year students showcased their projects on electric lamps/diyas, electric toys, and solar-based applications. Third-year students displayed their projects on embedded systems applications and IoT applications. The event provided an opportunity for students to showcase their creativity and innovation in the field of EEE. The exhibition was open to all, and students, faculty members, and industry experts attended the event. The exhibition provided a platform for students to showcase their talents and potential,

Industrial Visit at TRACO Cables Company - Kerala

Sona college of Technology had organized an industrial visit on 30th September, 2022 for the 3rd semester students of Department of Electrical and Electronics Engineering students along with faculties. The electrical wires and cables carry current from one element to another. They are the conductor through which electricity flows. These conductors are manufactured using copper and aluminium. Copper is considered a better option than aluminium because it has the quality to conduct electricity with high flexibility and very little resistance. There are several stages through which materials have to pass to produce cable and wires. All these steps are followed to determine the quality of the wire and match the industry standard.

Industrial Visit at BIEC – associated with ISRO

Sona college of Technology had organized an industrial visit on 5th – 7th September, 2022 for the batch of 5th semester students of Department of Electrical and Electronics Engineering. Students also gained knowledge about how television signals are broadcasted with the help of satellites. A working model was demonstrated. Various images of India taken at different angles from the satellites, for the purpose of geographical/weather study were seen. A latest image of moon obtained from satellite was also shown. Different electronic devices used in satellite and space communication were explained.

Institute- Industry Interaction Program- Capegemini

The institute-industry interaction program started with the signing of the MoU between Sona College of Technology and Capegemini. The MoU aimed to establish a partnership between the two organizations for collaborative research and development projects, faculty development programs, and student internships.

Livewire JAVA Program Training

Department of Electrical and Electronics Engineering organized a training program on "JAVA Essentials" in collaboration with Livewire for the third-year EEE students. The training program was aimed at equipping the students with the fundamental knowledge of Java programming.

The program was successfully completed by 44 students, and certificates were issued to them. The program was conducted by experienced trainers from Livewire, who provided the students with the necessary guidance and support throughout the program. The trainers also gave the students valuable insights into the real-world applications of Java programming language. The program provided the students with valuable skills that would help them in their future careers.

Faculty Patent Filed

S.No	Title of Innovation	Inventors	Application Number
1	Test Device for Circuit Breakers Having Magnetic actuator and Electronic Control Unit	Dr. S. Chandrasekar Prof / EEE / Dean (R&D) JRF : Dr. K. Karpagavani	202241033145
2	Automated Medicine Dispenser with Reminder and method of Dispensing Medicine Thereof	Dr. A. Jagadeeshwaran, Prof / EEE Dr. R. Shiva Kumar, Prof. / EEE Dr. K. S. Yamuna, AP / EEE PhD Scholar: Mr. H. Shree Kumar	202241006780
3	Cloud based Electric Vehicles Temperature Monitoring system using IOT	Dr. S. Padma, Prof. / EEE Dr. C.B.Venkatramanan, AsP / EEE Mr. D. Kesavan, AP / EEE Mr. S. Arun Kumar, AP / EEE Dr. S. Madhubalan, AP / EEE	202241040275
4	Method of Making Winter and Summer Revamp clothes by Chemical Treatment	Dr. K. Krishnamoorthi, AsP / EEE UG Student : Mr. P.S. Revanth	202241055788

Virtual Hackathon conducted by FIBRE

A three days virtual Hackathon conducted by FIBRE partner Institutions in Canada and India. Students participated in multidisciplinary teams and won prizes for their innovativ e design concepts related to "Pressure Ulcers".Pressure ulcers (also known as pressure sores or bedsores) are injuries to the skin and underlying tissue, primarily caused by prolonged pressure on the skin. They can happen to anyone, but usually affect people confined to bed or who sit in a chair or wheelchair for long periods of time.

Dissemination of Technical Knowledge through Publications

Author	Title of Paper	Name of the Journal	Index	Technical novelty and Major contributions
S. Padma, Professor/EEE	Speed Control of Switched Reluctance Motor by Genetic Algorithm - Based Optimal H - Infinity Control Approach	International Journal of Manufacturing Technology and Management	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	SCI	The improvement in PD performance of nanofiller blend oil is tested with increased voltage gradient and nanofiller concentration. PD of nanoblend oils for various concentrations of modified silica ranging from 0 to 0.1%wt was measured.
R. Arulmozhiyal Professor/EEE	Investigation on Solar PV generation and design of switched reluctance motor for Smart Agriculture actuation system	Dynamic Systems and Applications	SCI	To reduce stresses and losses across the switch of interleaved flyback converter is proposed. In the grid tied inverter system leakage current is one of the disadvantages and to avoid this H6 type inverter is used.
Dr. M. Senthilkumar Professor/EEE	Optimal Location and Sizing of Renewable Energy based DG Units in a Radial Distribution Power Network using Ant Lion Optimization Algorithm	Journal of Electrical Engineering	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.
M.Lavanya, R.Shivakumar, Professor/EEE	Performance analysis of ANFIS-PSO based STATCOM in an isolated renewable energy based micro-grid	Journal of Scientific & Industrial Research	SCI	This work proposes a novel application of Adaptive Neuro-Fuzzy Inference System in conjunction with Particle Swarm Optimization (PSO)-based controller for static synchronous compensator to improve the performance of a hybrid renewable energy based isolated micro grid environment.
C. B. Venkatramanan, ASP/EEE	Atom Search Optimized FOPI Controller of the DC–DC SEPIC Model with Matignon's Theorem Stability Analysis	IETE Journal of Research	SCI	An Atom Search Optimization technique is proposed to optimize the parameters of the controller in the outer voltage and inner current control loop of the DC–DC SEPIC model. The model is developed using MATLAB –Simulink, and the simulation analysis is carried out at rated load, setpoint tracking, source voltage, and load variation
K. Krishnamoorthi ASP/EEE	Integrated Renewable Smart Grid System Using Fuzzy Based Intelligent Controller	Intelligent Automation & Soft Computing	SCI	Capacitance Inductance (LCL) filters is implemented at its output to mitigate harmonics in presence of non-linear load. It's of highly important to choose LCL parameters wisely in order to attain good filtering effect. This work investigates the application of 5-H Bridge MLI with LCL filter at the output for efficient integration of renewable energy sources on to the grid.
S. Vijay Shankar, ASP/EEE K. Suresh, R. Saravanan	Design and Implementation of Comprehensive Converter	Journal of Electrical Engineering & Technology	SCI	Conversion in all the stages can be controlled by a digital controller according to the requirement. All four conversions can perform step-up as well as step-down process, so design of inductor and capacitor values are very much important.

Author	Title of Paper	Name of the Journal	Index	Technical novelty and Major contributions
V.Shanmugasundaram, AP/EEE	Electric power-grid modernization and energy management roadmap	Journal of nuclear energy science & power generation technology	Scopus	The grid has been an incredibly important and complex system, signifying the modern era's most remarkable engineering feats. With the evolution of cost-effective energy storage devices and the new green distributed energy resources concept of microgrid and smart grid has come into action and gained immense popularity.

## Connected World: IOT and Its applications

A guest lecture on "Connected World: IOT and Its applications" was organized by the Electrical and Electronics Engineering Department of IoT is an umbrella term that refers to the billions of physical objects or "things" connected to the Internet, all collecting and exchanging data with other devices and systems over the Internet. IoT devices can range from small ordinary household cooking appliances to sophisticated industrial tools. Each IoT component has a Unique Identifier (UID) and they can also transmit data without the assistance of humans.

IoT Based speaking system for Mute people Using Hand Gestures

Final Year EEE Students (J.S. Sweetha, J. Swetha, Rithisha) project titled " IoT Based speaking system for Mute people Using Hand Gestures" received Rs. 7500/-under students Project Scheme from TNSCST.

- It's very difficult for mute people to convey their message to regular people.
- Since regular people are not trained on hand sign language, the communication becomes very difficult. In emergency or other times when a mute person travelling or among new people communication with nearby people or conveying a message becomes very difficult.
- Here we propose a smart speaking system that helps mute people in conveying their message to regular people using hand motions and gestures.

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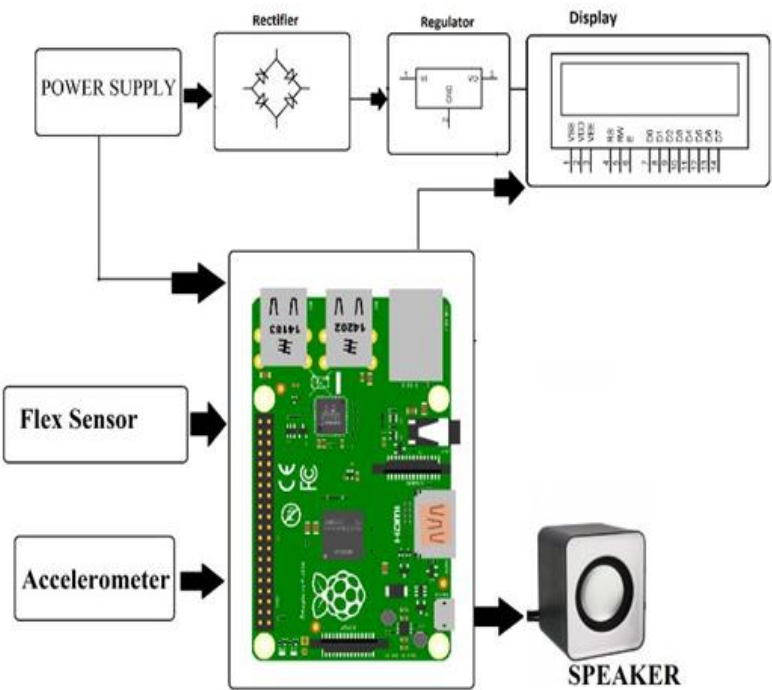
Ways to
Protect the environment at home

1. Conserve energy
2. Save water
3. Use eco-friendly products
4. Use filtered water
5. Start a compost pile
6. Plant vegetables
7. Recycle and reuse
8. Pick up litter
9. Make homemade desserts
10. Use cloth shopping bags

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Five new trends in EVs

❶ Wireless charging
❷ Smart power distribution
Challenges
Electric vehicles
Opportunities
❸ V2H & V2G
❺ Autonomous driving
❹ Connected vehicles

For each subsection

- Related technologies
- Benefits and business opportunities
- Technological developments (business cases)
- Prospects (challenges and opportunities)

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