VELAMMAL
INSTITUTE OF TECHNOLOGY

Chennai - Kolkata Highway, Panchetti, Ponneri

INSTITUTION'S INNOVATION COUNCIL
(Ministry of HRD Initiative)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTRA 23

(A Technical Magazine)

Academic Year 2022-2023

INSTITUTE VISION

To be a leader in imparting quality technical education, research & enterprising skills in pursuit of professional excellence.

INSTITUTE MISSION

- To promote quality education & technical skills to meet the industry requirements.
- To incorporate team work, leadership skills & lifelong learning.
- To facilitate career development & higher education assistance.
- To encourage innovative ideas for research & development and entrepreneurship for societal needs.
- To inculcate ethical responsibility & human values.

VISION OF THE DEPARTMENT

To produce highly competent Electrical Engineers and Researchers to fulfil the technological needs of society through innovation and product development.

MISSION OF DEPARTMENT

- To educate graduates with fundamental principles to acquire advanced technical knowledge in domains of Electrical and Electronics Engineering.
- To provide a progressive environment for innovative creations and rigorous practical training through creative activities in conventional and thrust areas of Electrical and Electronics Engineering.
- To inculcate Societal and Ethical values among the faculties and students.

PROGRAMEDUCATIONALOBJECTIVES (PEOs)

1. Graduates of the program will have successful technical and professional career.
2. Graduates of the program will reveal life-long learning to enhance technical skills and Managerial skills.
3. Graduates of the program will undertake societal responsibilities with ethical practice.

PROGRAMMESPECIFICOUTCOMES (PSOs)

1. **Foundation of Electrical Engineering:** Ability to understand the principles and working of electrical components, circuits, systems and control that are forming a part of power generation, transmission, distribution, utilization, conservation and energy saving. Students can assess the power management, auditing, crisis and energy saving aspects.
2. **Foundation of Mathematical Concepts:** Ability to apply mathematical methodologies to solve problems related with electrical engineering using appropriate engineering tools and algorithms.
3. **Computing and Research Ability:** Ability to use knowledge in various domains toidentify research gaps and hence to provide solution which leads to new ideas and innovations.

PROGRAM OUTCOMES(POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change.

TEAM MEMBERS

Editors-in-Chief

Mr S Athithyan,

IV Year EEE Student

Ms K Geethika,

III Year EEE Student

Editorial Committee

Mr L Prasanth, IV Year EEE Mr N

Nithin, IV Year EEE Ms B

Bhavatharani, III Year EEE Mr

Madhappan Lokesh, III Year EEE Mr S

Dhanush, II Year EEE Ms S Karunya, II

Year EEE Ms N Vaishnavi, II Year EEE

Staff Coordinators

Dr S Muthukaruppasamy., Ph.D.,

Associate Professor & Head Dr R

Karthikeyan.,

Assistant Professor / EEE

Velammal Institute of Technology

SMART STICK FOR BLIND

Logapriya A, Logeswari S, Shamitha T, Susmitha P (II Year EEE)

Blind person finds it difficult to detect the presence of any obstacles in their way while moving from one place to another and it is very difficult to find the exact location of the stick if it have been misplaced. Thus, the smart stick comes as a proposed solution to help the visually impaired people in their day to day living without the help of others. We proposed a solution for the blind people by using an ultrasonic sensor in the blind stick. The instrument stands used to perceive the obstacles at the range of four meters and infrared instrument is castoff to perceive the nearer complications in front of the blind people

AUTOMATIC PLANT WATERING SYSTEM

Aswini S, Pavithra U, Vijayalakshmi V, Yuvasree M (II Year EEE)

Irrigating fields is the most important and a very laborious task for the farmers, especially in the summer season. Manual watering increases the difficulty and is time consuming. Thus, we need effective technologies to overcome these problems. Auto-watering systems can be efficiently used to water plants when needed, which controls when and how much watering needs to be done. This system can be effectively used from small gardens to a large crop field, thus also conserving water. We can implement the above prototype using sprinklers or drip emitters for effective irrigation. For large scale implementation, we can use solar panels to conserve energy.

GARBOPHILE (SMART DUSTBIN)

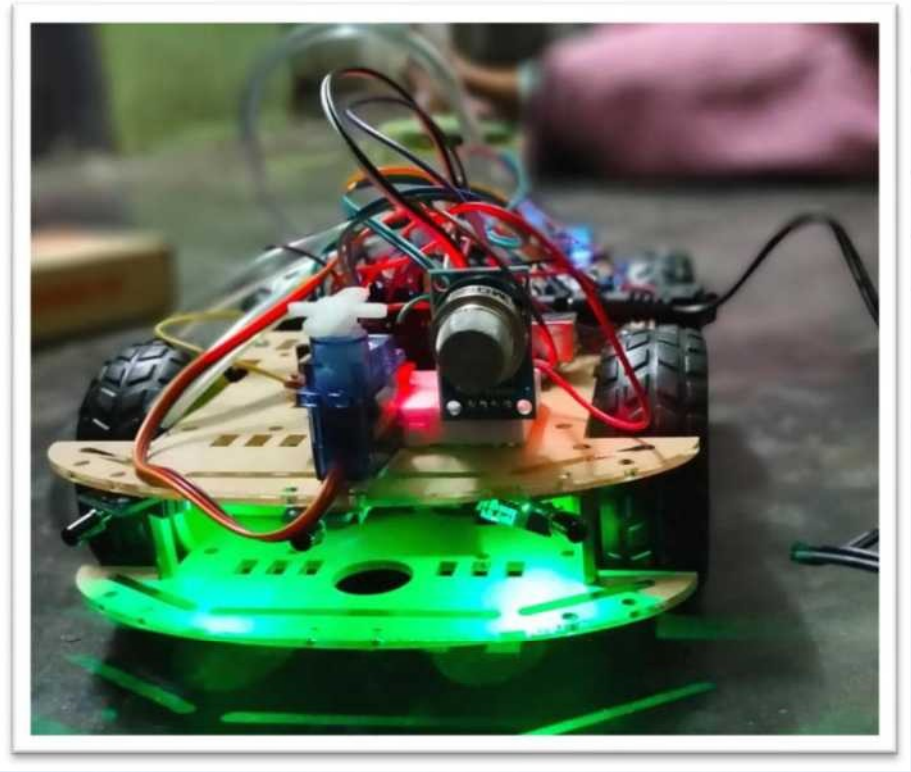
Amaya M, Chris Madonna F, Vaishnavi N, Vidyasree T G (II Year EEE)

In the recent decades, urbanization has increased tremendously. At the same phase, there is an increase in waste production. Waste management has been a crucial issue to be considered. This proposal is a way to achieve this good cause. In this project, smart dustbin is built on a microcontroller based platform Arduino Uno board which is interfaced with the Servo motor and ultrasonic sensor. Ultrasonic sensor is placed at the top of the dustbin, which will measure the stature of the dustbin. The threshold stature is set at a particular level. Arduino will be programmed in such away that when someone will comes in front of dustbin the servomotor will come in action and open the lid for the person to put the waste material into the dustbin.

OBSTACLE AVOIDING ROBOT CAR

Arockiya Jeya Stefy J, Karunya S, Periyaswamy Alamelu, Arivuchudar.J (II Year EEE)

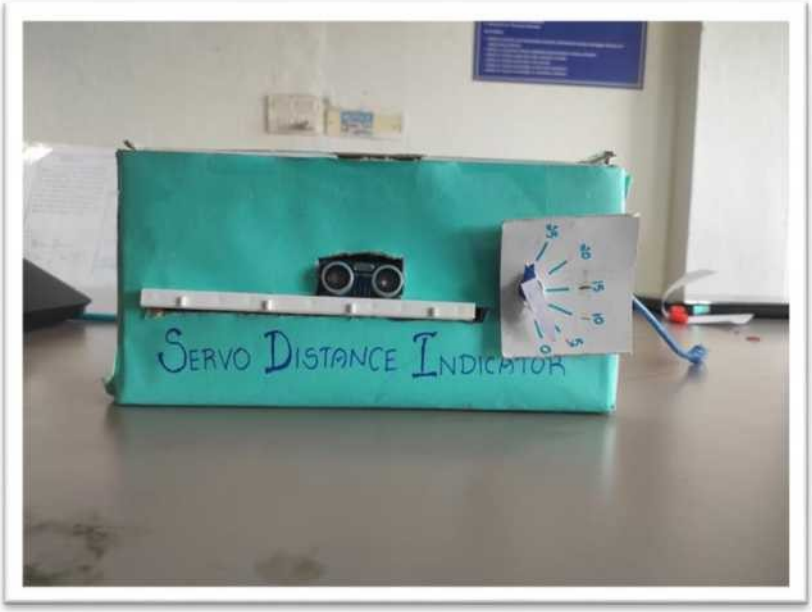
The project is design to build an obstacle avoidance robotic vehicle using ultrasonic sensors for its movement. Arduino is used to achieve the desired operation. The project proposes robotic vehicle that has an intelligence built in it such that it directs itself whenever an obstacle comes in its path. This robotic vehicle is built, using Arduino. An ultrasonic sensor is used to detect any obstacle ahead of it and sends a command to the Arduino. Depending on the input signal received, the Arduino redirects the robot to move in an alternate direction by actuating the motors which are interfaced to it through a motor driver. At the same time, we can control steering gear to realize the obstacle avoidance function.



SERVO DISTANCE INDICATOR

Akhilesh R, Dineshkumar P, Selvaganeshan M, Jayabalan S, Venkat Ragavan D (II Year EEE)

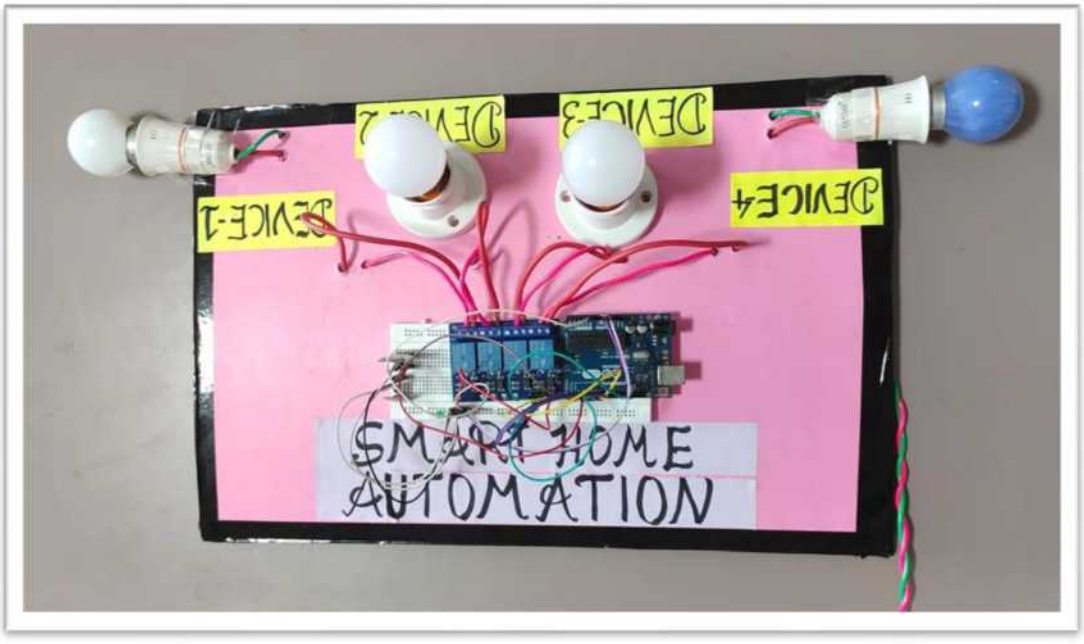
The servo distance indicator can measure a variety of distances and can be used in numerous applications. For example, it is commonly used in the automotive industry to measure the distance between a vehicles bumper and an object to prevent collisions. It is also used in the aerospace industry to measure the distance between aircraft and other objects during flight. The accuracy of the servo distance indicator is one of its key advantages. The device can measure distances to within fractions of a millimeter, making it ideal for applications where accuracy is crucial. In addition to its accuracy, the servo distance indicator is also highly dependable. It is designed to withstand harsh environments and can operate in extreme temperatures and conditions.



SMART HOME AUTOMATION SYSTEM

Dhanush S, Rajavel Rahul, Shiviksan C, Vijay Ganesh I (II Year EEE)

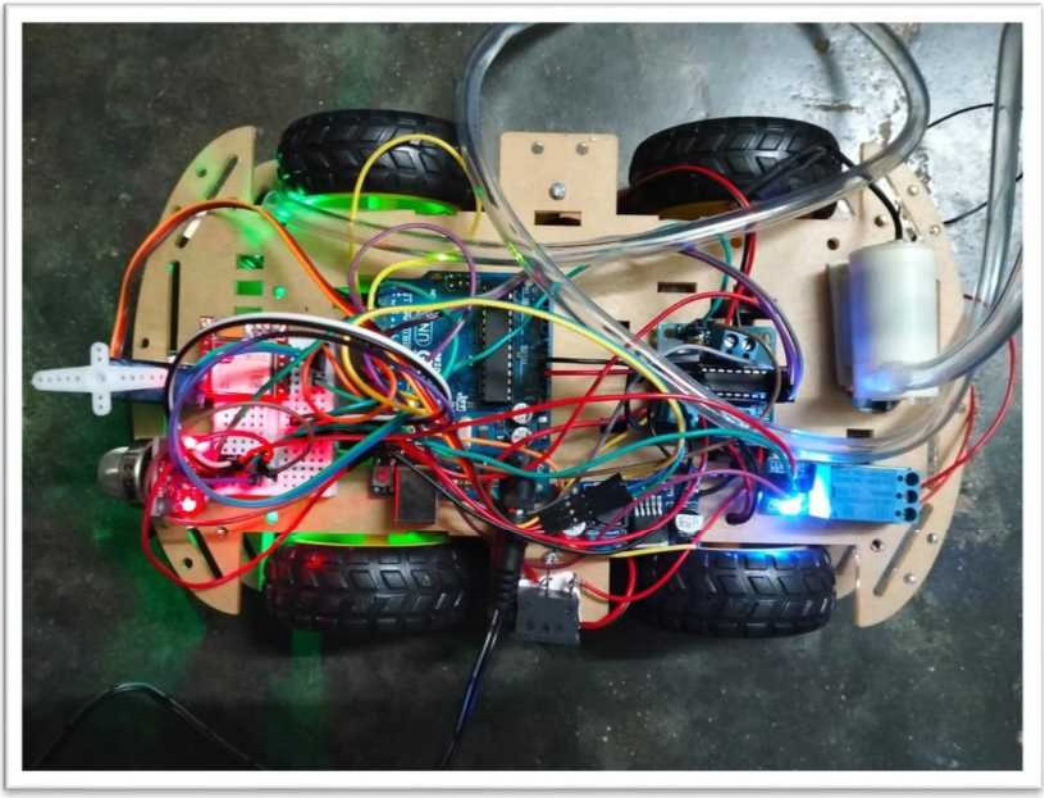
Smart home automation systems utilizing Bluetooth technology have emerged as a popular and convenient choice for modern homes. These systems allow homeowners to control and manage various aspects of their homes, including lighting, heating, security, and entertainment, remotely through Bluetooth-enabled devices such as smartphones or tablets. In this project, we provide an in-depth overview of Bluetooth-based smart home automation systems, covering their architecture, features, benefits, and challenges. This hub acts as a control centre, allowing homeowners to manage and automate different functions of their home from a single device.



FIRE DETECTION ALARM SYSTEM

Heptha T, Nishanth Vadanam S, Shoban K, Shyam Ganesh V, Kamal Kumar (II Year EEE)

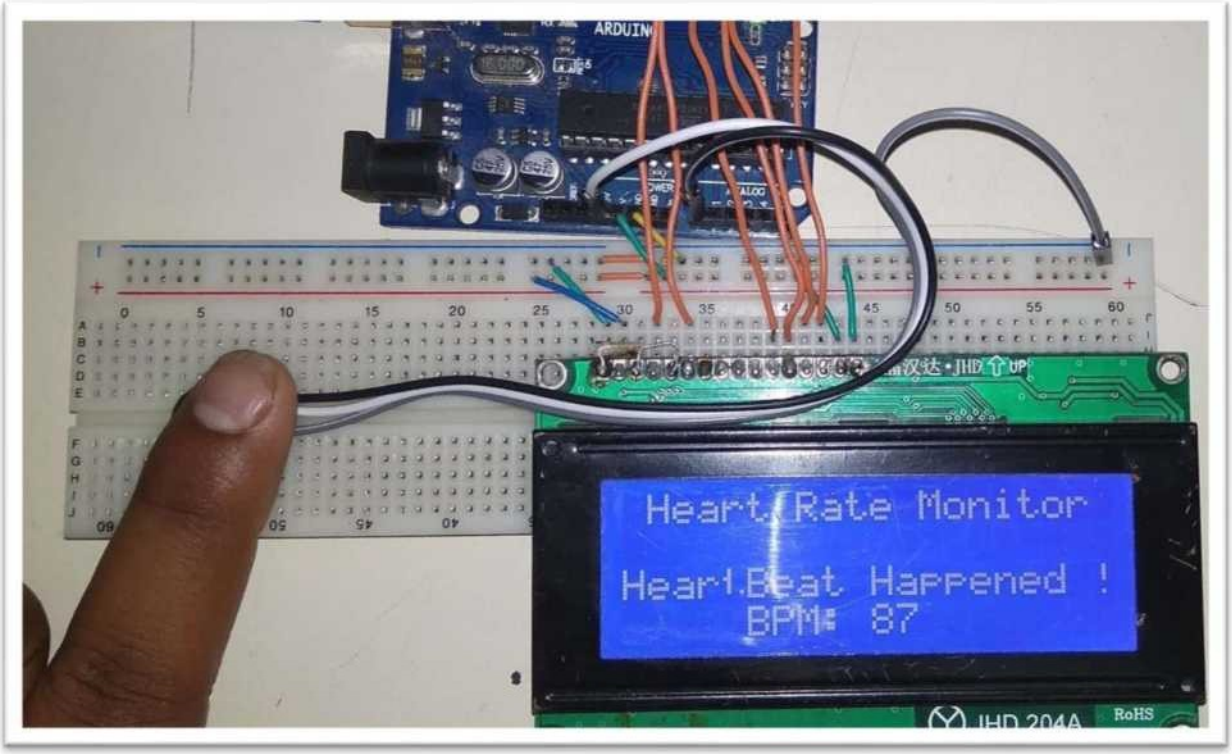
This project presents the design and implementation of an Arduino-based fire-fighting robot car with a SIM module. The system is designed to remotely detect and extinguish fires, making it suitable for use in environments where human intervention may be hazardous or impossible. The robot car is equipped with a range of sensors that enable it to detect fire and smoke, including an MQ-2 gas sensor and a flame sensor. When a fire is detected, the system sends a message to the user's phone through the SIM module. The user can then remotely control the robot car to navigate to the location of the fire and extinguish it using a water pump.



RESPIRATORATION RATE MONITOR

Deevi Rohith Kumar, Madhappan Lokesh, Sai Ram C (III Year EEE)

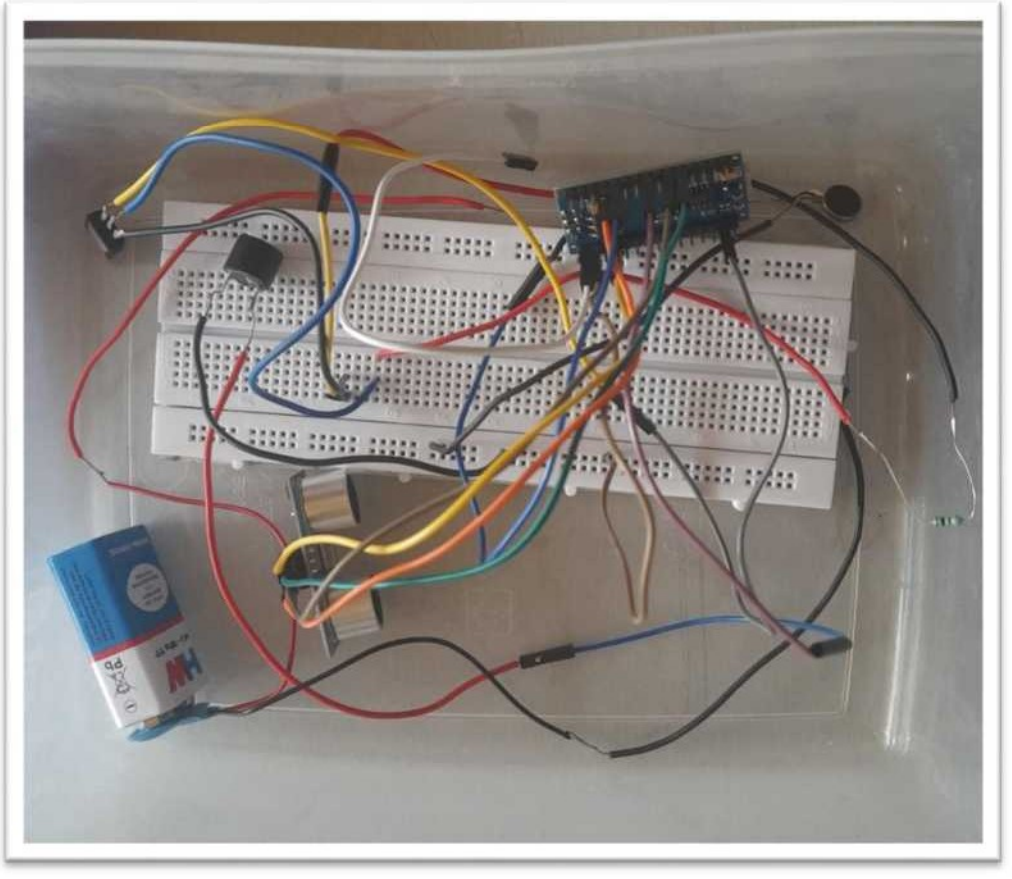
Remote health monitoring is rapidly growing in the healthcare field. With tools like the Fitbit and Apple watch, people are able to monitor vital health data from anywhere in the world. Researchers, engineers, and health care professionals are continuously involved in research in this field with the aim of improving the quality of healthcare services. It is essential to monitor the proper functioning of the human body considering various parameters such as heart rate, body temperature, and pressure. Nowadays most of the wearables have these health monitoring features built-in.



SMART BLIND SHOES USING ULTRASONICS SENSOR AND ARDUINO

Bhavatharani B, Nemika R (III Year EEE)

Power of sight is considered as the most important of all senses. Blind people are often dependent on others for their daily routine. Over time several advancements in technology has helped in increasing entertainment and comfort for the blind. “Smart shoe” can assist the blind on their daily routine and can act as a comfortable and safe companion on their journey.



DRIPS MONITORING SYSTEM USING IOT

Madhvesh R C, Surendhar C K, Youshies Yeswanth G (III Year EEE)

In our current medical care system, the monitoring of patients in a hospital throughout the day is a tiresome process. Sometimes Doctors or Nurses are too busy, so they can't monitor each patient. This causes many problems. An example of such type of work in our hospital is injecting saline or Intravenous (IV) fluids in to the vein of patient. If the drip system is not monitored on time, it will causes problems like backflow of fluid, blood loss etc. In order to reduce the workload and overcome such critical situation in the area of an intravenous drip monitoring system, we proposed a system called Automated Intravenous Drip Monitoring System

DEMAND PREDICTION USING AI

Dr R Karthikeyan, Assistant Professor, Departmnet of EEE

Demand prediction, the science of forecasting future requirements for products or services, has evolved into a cornerstone of modern business strategy. With the advent of artificial intelligence (AI), this domain has been revolutionized, enabling unparalleled precision, agility, and insight. Unlike traditional methods, AI employs advanced machine learning algorithms to decipher intricate patterns in data. By integrating historical sales, consumer behavior, market dynamics, and external variables such as weather or geopolitical events, AI delivers forecasts that are both adaptive and remarkably accurate. Moreover, its ability to process vast, multidimensional datasets in real time gives businesses a competitive edge, allowing them to anticipate demand fluctuations and act proactively. Industries across the spectrum have embraced this innovation. Retailers leverage AI to optimize inventory, avoiding stockouts and overstocking. Healthcare providers predict medicine and equipment demand during health crises, while manufacturers streamline production to minimize waste. By enhancing resource allocation and operational efficiency, AI not only drives profitability but also ensures a superior customer experience. As AI continues to advance, its role in demand prediction will become even more transformative, pushing the boundaries of forecasting and empowering businesses to navigate uncertainty with confidence

TRANSMISSION LINE FAULT DETECTION

Mr V Subramaniyan, Assistant Professor, Department of EEE

Transmission Line Fault Detection: Ensuring Power Reliability Transmission lines serve as the lifeline of modern power systems, ensuring the delivery of electricity over vast distances. However, these lines are frequently exposed to faults caused by environmental factors, equipment malfunctions, or external interferences. Detecting such faults efficiently is critical to maintaining the reliability and stability of power systems. Traditional fault detection methods, often reliant on manual inspections, are timeintensive and prone to delays. Modern systems, however, utilize advanced technologies like IoT and machine learning to revolutionize fault detection. Smart sensors installed along transmission lines continuously monitor parameters such as voltage, current, and line impedance. These sensors can swiftly identify anomalies, precisely locate the fault, and notify operators in real time. This proactive approach minimizes downtime, reduces energy losses, and ensures timely repairs, preventing widespread power outages. Additionally, some systems employ drones or robotic solutions for on-site inspections, further enhancing safety and efficiency. The integration of advanced fault detection systems not only strengthens the reliability of power transmission but also aligns with the broader goals of sustainability and resource efficiency. By adopting such technologies, we can build a future where power systems are more robust, responsive, and resilient, supporting the growing demands of modern society

The Future of Renewable Energy Systems

Mr K Kaliagurumoorthi, Assistant Professor, Department of EEE

The Future of Renewable Energy Systems As the world faces climate change and dwindling fossil fuel reserves, renewable energy systems have become the foundation of a sustainable future. Electrical engineers play a vital role in advancing technologies like solar, wind, hydro, and geothermal energy. These sources now contribute nearly 30% of global electricity, with growing targets worldwide. Key Innovations Shaping the Future 1.Energy Storage: Advanced batteries like lithium-ion and flow systems ensure stable energy supply. 2.Smart Grids: AI-driven grids optimize energy flow and predict demand, enhancing reliability. 3.Floating Solar & Offshore Wind: These solutions tap energy from oceans and lakes, addressing land scarcity. 4.Green Hydrogen: Produced via renewable electricity, hydrogen offers a clean energy alternative for industries. Overcoming Challenges Issues like intermittency, high initial costs, and grid upgrades persist. Recycling solar panels and batteries also requires innovative solutions. However, the decreasing costs of renewable technologies are promising. The Road Ahead By 2050, renewables could meet 85% of global energy demand. Electrical engineers are pivotal in driving this transition, with their contributions to smarter grids, efficient systems, and sustainable innovations. Together, we can create a cleaner, greener energy future.

DRAWINGS

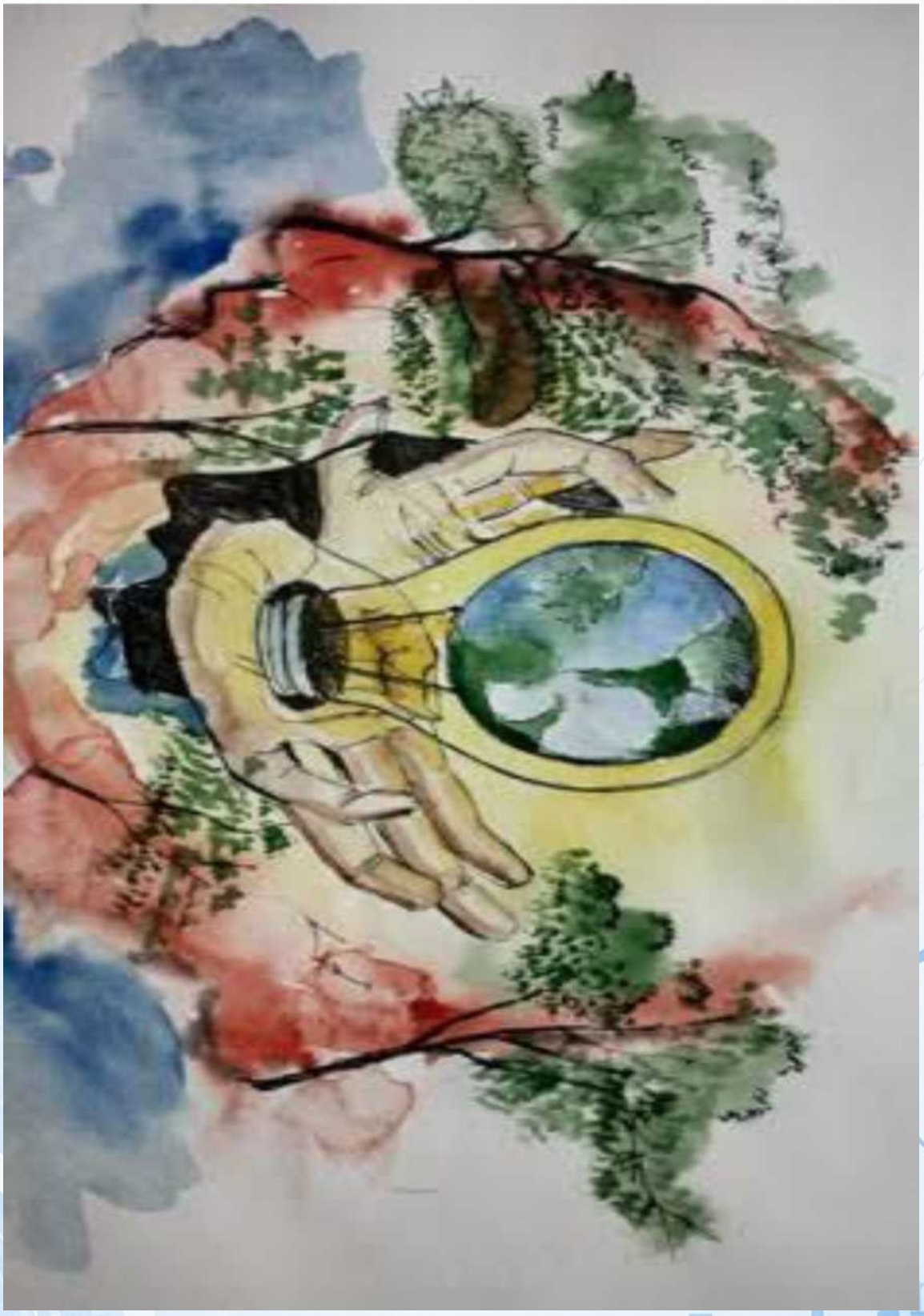
Ms U Pavithra, II Year EEE

Ms I Suruthi, IV Year EEE

DRAWINGS

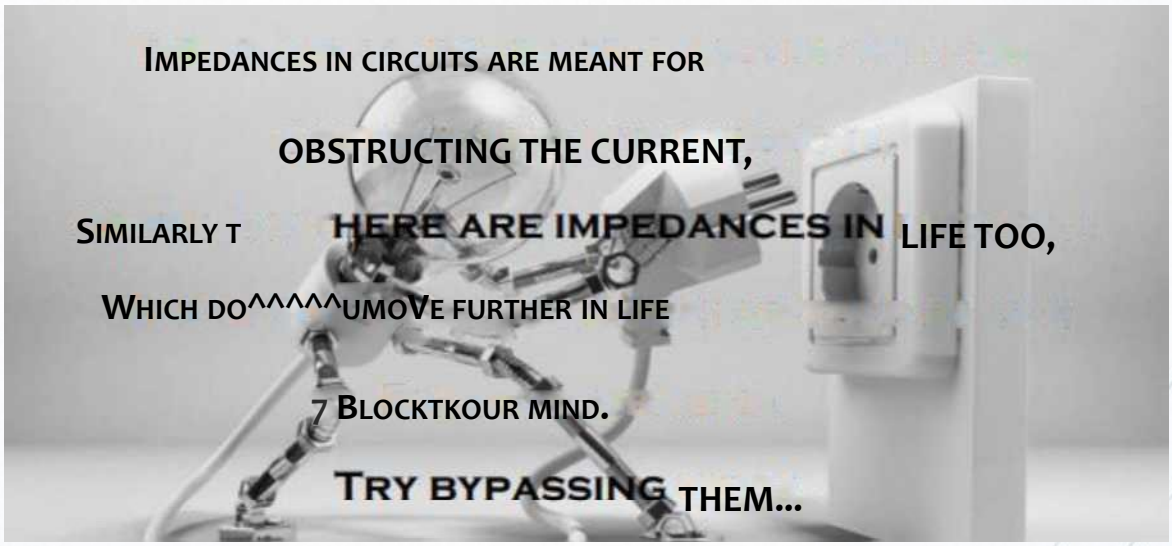
Mr B Arjun, IV Year EEE

Ms B Bhavatharani, III Year EEE

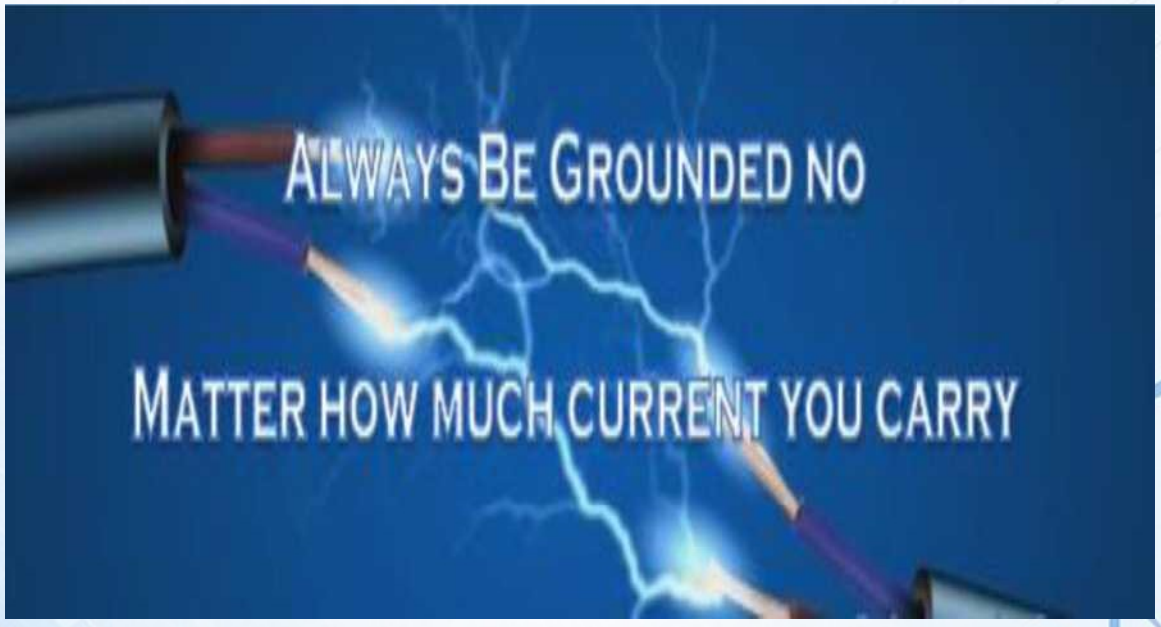


Mr Selvaganeshan M, II Year EEE

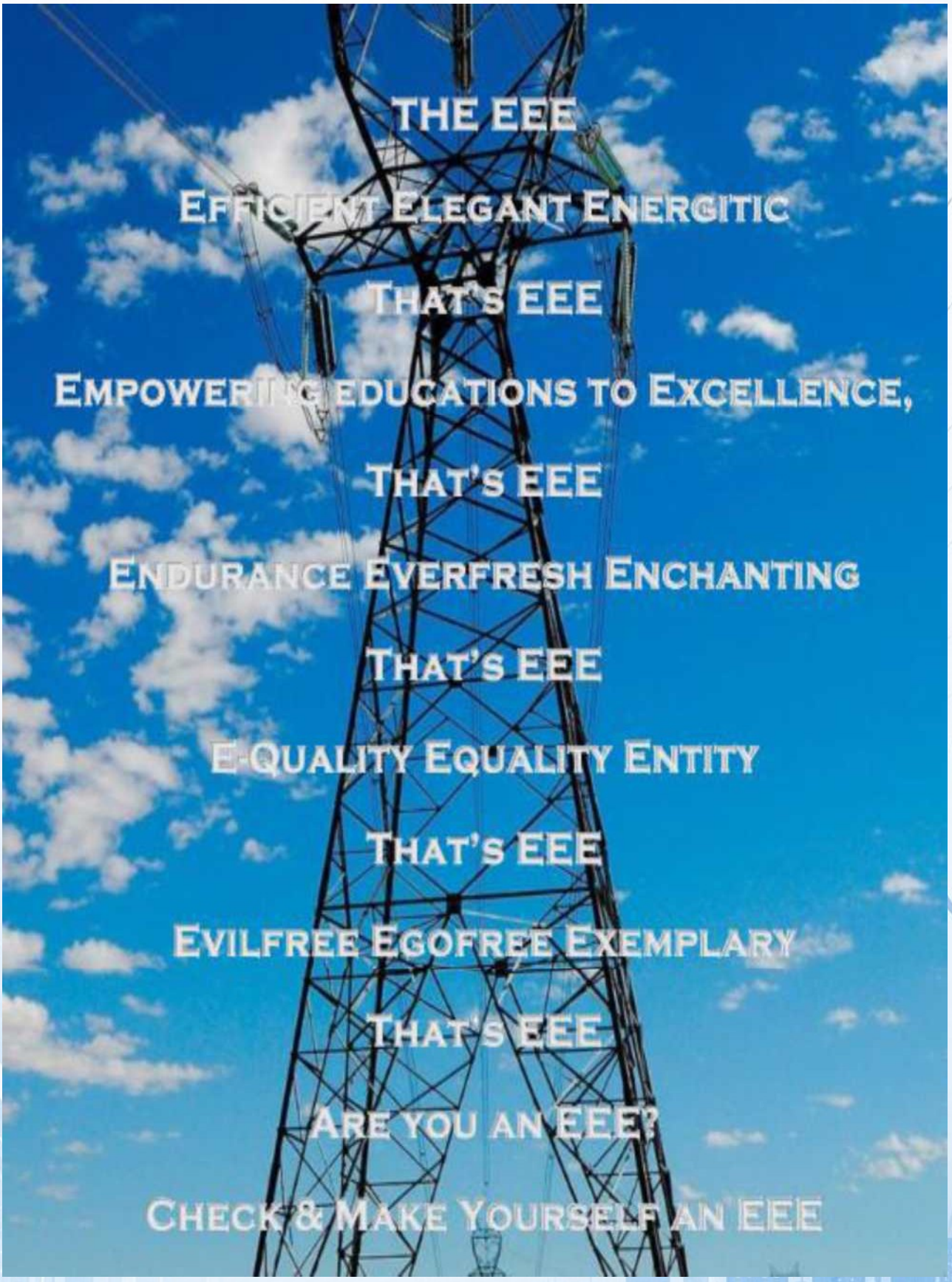
POEMS



Mr S Dhanush, III Year EEE



Ms J Arivuchudar, II Year EEE



Mr Akhilesh R, II year EEE