



# **MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**

**Autonomous Institution – UGC, Govt. of India**

**Accredited by NBA & NAAC with 'A' Grade**

**NIRF Indian Ranking, Accepted by MHRD, Govt. of India**

**Maisammaguda, Dhulapally, Secunderabad – 500 010, Telangana**

**A.Y : 2021-22**

**VOL.2**

Under  
Student Chapter IEEE, IETE & Technical Association Electropheenix

# **ELEKTOR**

**HALF YEARLY TECHNICAL MAGAZINE**

**DEPARTMENT OF  
ELECTRICAL & ELECTRONICS ENGINEERING**

**EEE**

**DEPARTMENT VISION**

- To develop competitive industry ready electrical engineers by establishing traditions, which will foster creativity and growth of excellence to effectively meet the technological requirements..

**Vision****DEPARTMENT MISSION**

- To develop proficiency by imparting application oriented knowledge and inculcate analytical thinking to solve the technological problems associated with analyzing, designing and testing electrical systems.

**Mission****ABOUT THE DEPARTMENT**

The Department of Electrical & Electronics Engineering is accredited by NBA, with an intake of 60 students. The Dept. has state of the art laboratories with latest softwares like MATLAB, ORCAD, SCI LAB, PSPICE and Multisim. We have well qualified faculty members. Several faculty members have received their best teacher awards from institutions of International repute and have been working on research and development projects and regularly publish their work in international journals and conferences. EEE department faculty teams attained patent rights for their technological innovations. The Dept. established IEEE, ISTE student chapters under which it organizes National Level Technical Symposium -FUTURE SASTRA & State Level Technical Symposium- MEDHA every academic year. The Dept. organized National conference on "Emerging Trends in Electrical Systems & Engineering" NCETESE, International Conference on "Emerging Trends in Electrical Systems & Engineering"(ICETESE) every year since 2014, The Dept. organizes Faculty Development Programmes, Refresher courses and workshops in different streams and Student Development Programmes like Workshops, intra college conferences, Industrial visits , Guest lectures and our students actively participate in hackathon programmes conduct at state and National level. Our students are actively participated and won prizes in curricular activities organized by other colleges. The Dept. also organizes regular student seminar sessions of two hours per week for I to IV B.Tech student to enhance their all round performance.

The Dept. also offers value added certification Courses on oxford, Microsoft, CISCO certification through Oxford University, Microsoft Innovation Centre and CISCO Networking Academy respectively. The College Offers Campus Recruitment Training Programmes in collaboration with TIME and FACE Institutions. The Department also publishes the Registered Journal "International Journal of Research in Signal Processing, Computing and Communication-System Design (IJRSCSD) with an ISSN: 2395-3187.

## PO'S

<b>PO1</b>	<b>Engineering knowledge</b>	An ability to apply knowledge of mathematics (including probability, statistics and discrete mathematics), science, and engineering for solving Engineering problems and modeling
<b>PO2</b>	<b>Problem analysis</b>	An ability to design, simulate and conduct experiments, as well as to analyze and interpret data including hardware and software components
<b>PO3</b>	<b>Design / development of solutions</b>	An ability to design a complex electronic system or process to meet desired specifications and needs
<b>PO4</b>	<b>Conduct investigations of complex problems</b>	An ability to identify, formulate, comprehend, analyze, design synthesis of the information to solve complex engineering problems and provide valid conclusions.
<b>PO5</b>	<b>Modern tool usage</b>	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
<b>PO6</b>	<b>The engineer and society</b>	An understanding of professional, health, safety, legal, cultural and social responsibilities
<b>PO7</b>	<b>Environment and sustainability</b>	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and demonstrate the knowledge need for sustainable development.
<b>PO8</b>	<b>Ethics</b>	Apply ethical principles, responsibility and norms of the engineering practice
<b>PO9</b>	<b>Individual and team work</b>	An ability to function on multi-disciplinary teams.
<b>PO10</b>	<b>Communication</b>	An ability to communicate and present effectively
<b>PO11</b>	<b>Project management and finance</b>	An ability to use the modern engineering tools, techniques, skills and management principles to do work as a member and leader in a team, to manage projects in multi-disciplinary environments
<b>PO12</b>	<b>Life-long learning</b>	A recognition of the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning

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PSO'S

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The graduates of the department will attain:

**PSO1:** Analyze, Design and Implement application specific electrical system for complex engineering problems, Electrical And Electronics Circuits, Power Electronics and Power Systems by applying the knowledge of basic science, Engineering mathematics and engineering fundamentals

**PSO2:** Apply modern software tools for design, simulation and analysis of electrical systems to engage in life- long learning and to successfully adapt in multi disciplinary environments

**PSO3:** Solve ethically and professionally various Electrical Engineering problems in societal and environmental context and communicate effectively

## PEO'S

**PEO1-PROFESSIONAL DEVELOPMENT**

To develop in the students the ability to acquire knowledge of Mathematics, Science & Engineering and apply it professionally within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability with due ethical responsibility.

**PEO2-CORE PROFICIENCY**

To provide ability to identify, formulate and solve engineering problems with hands on experience in various technologies using modern tools necessary for engineering practice to satisfy the needs of society and the industry.

**PEO3- TECHNICAL ACCOMPLISHMENTS**

To equip the students with the ability to design, experiment, analyze and interpret in their core applications through multi disciplinary concepts and contemporary learning to build them into industry ready graduates.

**PEO4- PROFESSIONALISM**

To provide training, exposure and awareness on importance of soft skills for better career and holistic personality development as well as professional attitude towards ethical issues, team work, multidisciplinary approach and capability to relate engineering issues to broader social context.

**PEO5- LEARNING ENVIRONMENT**

To provide students with an academic environment and make them aware of excellence, leadership, written ethical codes and guidelines and the life-long learning to become a successful professional in Electrical and Electronics Engineering

## MESSAGES

## Founder Chairman's Message

**Ch. Malla Reddy**

Founder Chairman, MRGI  
Hon'ble Minister, Govt. of Telangana State

MRECW has made tremendous progress in all areas and now crossing several milestones within a very short span of time and now I feel very happy to know that the students and faculty of the EEE department of MRECW are bringing out the volume-2 of the Technical magazine Elektor in A.Y 2019-20. As I understand this magazine is intended to bring out the inherent literary talents in the students and the teachers and also to inculcate leadership skills among them. I am confident that this issue will send a positive signal to the staff, students and the persons who are interested in the educational and literary activities

## Principal's Message

I congratulate the department of EEE, MRECW for bringing out the second issue of the prestigious half yearly department technical Magazine Elektor under A.Y: 2019-20, I am sure that the magazine will provide a platform to the students and faculty members to expand their technical knowledge and sharpen their hidden literary talent and will also strengthen the all round development of the students. I am hopeful that this small piece of literary work shall not only develop the taste for reading among students but also develop a sense of belonging to the institution as well. My congratulations to the editorial board who took the responsibility for the arduous task most effectively. I extend best wishes for the success of this endeavor.

**Dr. Y. Madhatee Latha**

Principal

## HOD'S MESSAGE

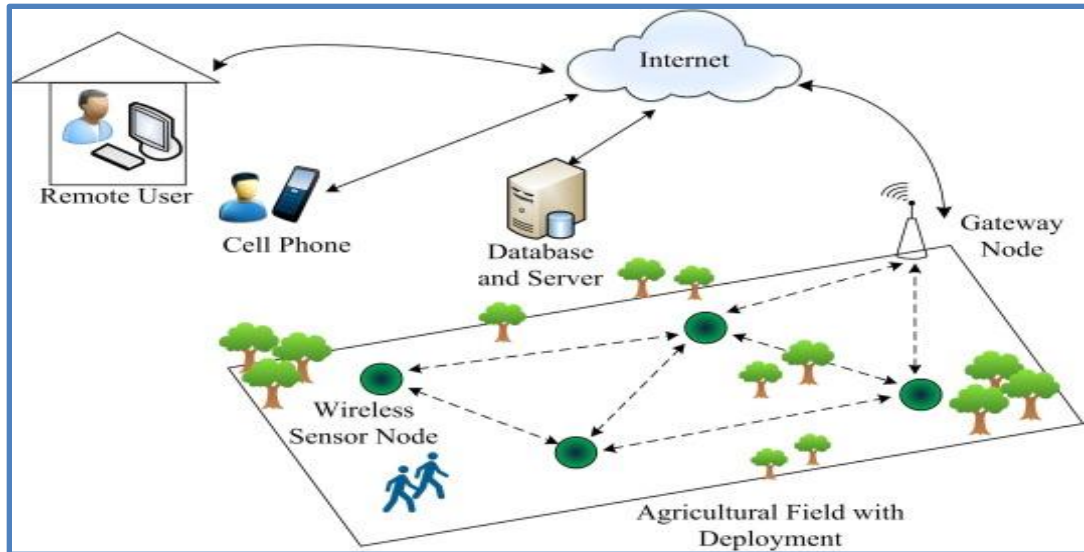
It is an occasion of great pride and satisfaction for the department of EEE, MRECW to bring out the second issue of the half yearly of the Technical magazine Elektor under A.Y:2019-20, it gives me immense pleasure to note that the response to the magazine has been over whelming. The wide spectrum of articles gives us a sense of pride that our students and faculties possess creative potential and original thinking in ample measures. Each article is entertaining interesting and absorbing. I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them.

**Prof. N. Raveendra**

HOD

## FACULTY ARTICLES

### WIRELESS SENSOR NETWORKS



A wireless sensor network is a wireless distributed autonomous devices using sensors to cooperatively physical (or) environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants, at different locations. A collection of sensing devices that can communicate wirelessly.

#### Components of WSN:

##### 1. Sensors:

Sensors in WSN are used to capture the environmental variables and which is used for data acquisition. Sensor signals are converted into electrical signals.

##### 2. Radio Nodes:

It is used to receive the data produced by the Sensors and sends it to the WLAN access point. It consists of a microcontroller, transceiver, external memory, and power source.

##### 3. WLAN Access Point:

It receives the data which is sent by the Radio nodes wirelessly, generally through the internet.

##### 4. Evaluation Software:

The data received by the WLAN Access Point is processed by a software called as Evaluation Software for presenting the report to the users for further processing of the data which can be used for processing, analysis, storage, and mining of the data.



**V . Brahmam yadav**  
**Associate Professor**

## AI-BASED APPLICATIONS IN HEALTHCARE DEVICES



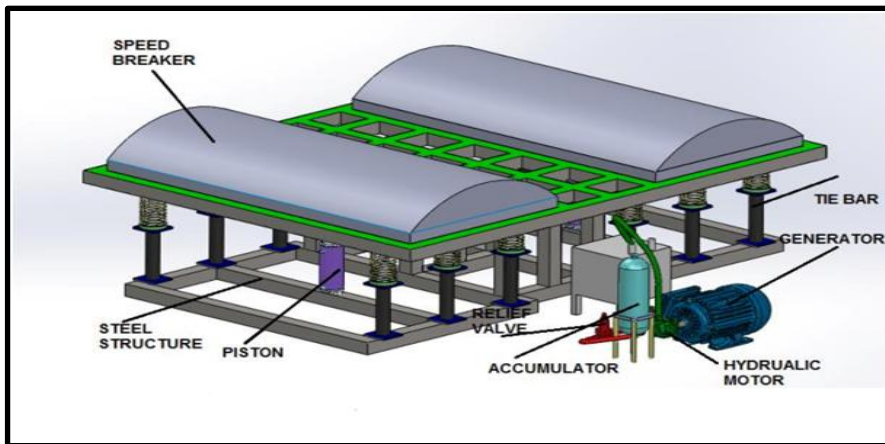
This study examines the current state of artificial intelligence (AI)-based technology applications and their impact on the healthcare industry. In addition to a thorough review of the literature, this study analyzed several real-world examples of AI applications in healthcare. The results indicate that major hospitals are, at present, using AI-enabled systems to augment medical staff in patient diagnosis and treatment activities for a wide range of diseases. In addition, AI systems are making an impact on improving the efficiency of nursing and managerial activities of hospitals. While AI is being embraced positively by healthcare providers, its applications provide both the utopian perspective (new opportunities) and the dystopian view (challenges to overcome). It is clear that rapid advances of AI and related technologies will help care providers create new value for their patients and improve the efficiency of their operational processes. Nevertheless, effective applications of AI will require effective planning and strategies to transform the entire care service and operations to reap the benefits of what technologies offer. Artificial intelligence (AI) is a powerful and ever-emerging technology that has the potential to improve capabilities across a multitude of industries. Medical devices with artificial intelligence hold the promise of revolutionizing the health care industry, helping medical professionals more accurately and effectively diagnose and treat their patients and improve their overall care. Along with its benefits, medical device artificial intelligence also faces challenges, including the need for regulation to keep up with the pace of technology advancement.

**Mr. V. Naresh**  
**Asst. Professor**



## STUDENT ARTICLES

## POWER GENERATION FROM SPEED BREAKER

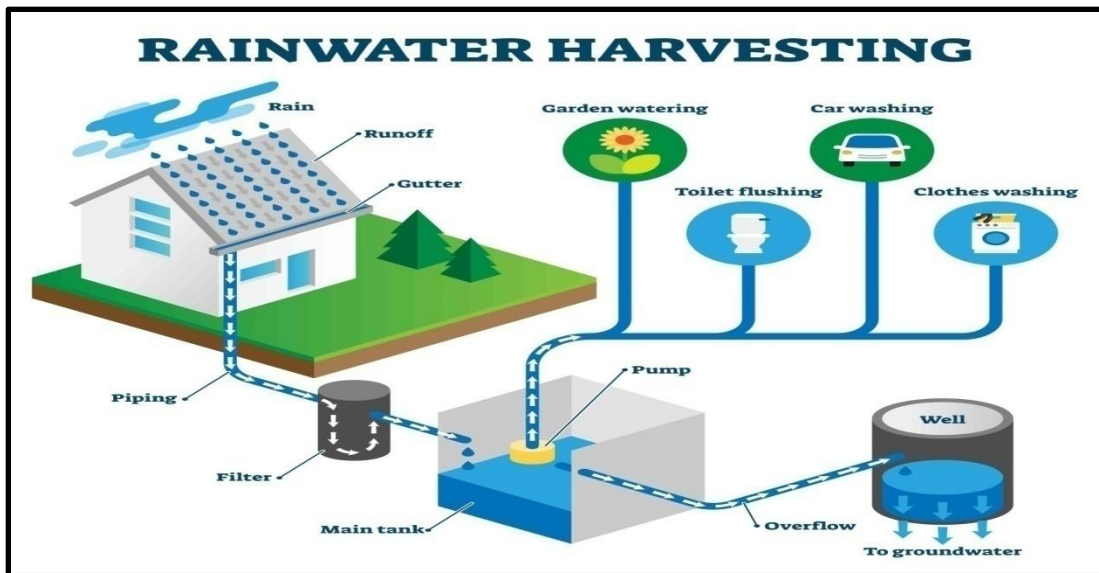


Electricity is generated by replacing the usual speed breakers with some simple mechanism. As vehicles pass over the speed breakers, rack and pinion mechanism works and with the help of high tension springs in turn generate electricity. This method is an effective way to produce electricity as the number of vehicles is ever increasing. It can be effectively placed near toll plazas, parking lots and other locations where density of vehicles is very high. A rack and pinion, spring assembly mechanism is provided which transfer the motion to a DC motor/generator for electricity generation. This method provides a cost effective way to generate electricity from the mechanical energy of dynamic vehicles on roads. A large amount of energy is wasted by the vehicles on the speed breakers through friction, every time it passes over it. Energy can be produced by using the vehicle weight and speed. So here we propose a smart speed breaker that generates power. The reciprocating motion of the speed breaker is converted into rotary motion using the rack and pinion arrangement. We design a smart speed breaker that can pass vehicles coming from both sides and yet generate energy from it. The system makes use of mechanical assembly with metal sheets with linkages that press down with spring arrangement. The system makes use of the speed breaker press and then uses a rack and pinion arrangement to press down and run generator motor thus generating energy. The spring mechanism is the used to drive the speed breaker back into original position. It converts rotary motion into linear motion, but sometimes we use them to change linear motion into rotary motion. This mechanism is very economical and easy to install. By doing proper arrangements we may generate high power electricity from road traffic.



**G PRATHUSHA**  
**16RHIA0213**

## RAIN WATER HARVESTING



Water Scarcity is serious problem throughout the world for both Urban and rural community. Rain water harvesting is defined as the process of augmenting the natural infiltration of rain water or surface water into the ground by some artificial methods. In rooftop harvesting, the roof becomes the catchments and the rain water is collected from the roof of the house/building it can either be stored in a tank or diverted to recharge pit etc. This method is less expensive and very effective and if implemented properly helps in augmenting the ground water level of the area. The methods of rooftop rain water harvesting are recharge pit, recharge trenches, storage tanks, abandoned dug wells, bore- well .The present study tells us 2,87,536 liters of water harvested per year in four numbers of underground storage tanks. Rain water harvesting is the small-scale collection and storage runoff for irrigated agriculture, is recognized as a sustainable strategy for ensuring food security, especially in monsoonal landscapes in the developing world.



**K SRAVANI**  
**17RH5A02132**

## SMART HOME TECHNOLOGY

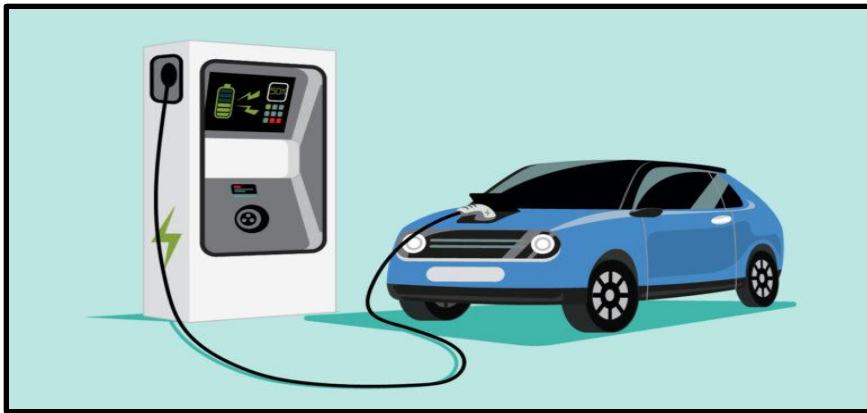


Smart Home technology started for more than a decade to introduce the concept of networking devices and equipment in the house. According to the Smart Homes Association the best definition of smart home technology is: the integration of technology and services through home networking for a better quality of living. Many tools that are used in computer systems can also be integrated in Smart Home Systems. Now, we present the Technologies and tools that can be integrated or applied in Smart Home system. A smart home refers to a convenient home setup where appliances and devices can be automatically controlled remotely from anywhere with an internet connection using a mobile or other networked device. Devices in a smart home are interconnected through the internet, allowing the user to control functions such as security access to the home, temperature, lighting, and a home theater remotely. Smart home appliances come with self-learning skills so they can learn the homeowner's schedules and make adjustments as needed. Smart homes enabled with lighting control allow homeowners to reduce electricity use and benefit from energy-related cost savings. Some home automation systems alert the homeowner if any motion is detected in the home when they're away, while others can call the authorities—police or the fire department—in case of imminent situations.

**K SAILAJA**  
**16RHIA0249**



## ELECTRIC VEHICLES



An electric car is powered by an electric motor instead of a petrol engine. The electric motor gets energy from a controller, which regulates the amount of power based on the driver's use of an accelerator pedal. The electric car also known as electric vehicle or EV) uses energy stored in its rechargeable batteries, which are recharged by common household electricity. Thus an electric vehicle will have three basic components:

Energy storage unit, Controller, Propulsion system. The energy storage unit will have a way to store power. A chemical battery is the most common energy storage technology currently, although it can be different-for example- A fuel cell(which gets its electricity from hydrogen rather than a battery pack), can be used instead of a chemical battery as the energy storage unit. The controller acts as a pipeline or gateway to the electric motor.. The controller will do other things too-it moderates the power, will also acts as a converter-converts power from DC to AC, or it might also increase or decrease the amperage etc. The controller is the brains of the system. The electric motor, which is the propulsion system, converts the electric power and converts this into physical energy for movement. Electric vehicles have low running costs as they have less moving parts for maintaining and also very environmentally friendly as they use little or no fossil fuels (petrol or diesel). While some EVs used lead acid or nickel metal hydride batteries, the standard for modern battery electric vehicles is now considered to be lithium ion batteries as they have a greater longevity and are excellent at retaining energy, with a self discharge rate of just 5% per month. Despite this improved efficiency, there are still challenges with these batteries as they can experience thermal runaway, which have, for example, caused fires or explosions in the Tesla model S, although efforts have been made to improve the safety of these batteries.



**K SAILAJA**  
**18RH15A0209**

## AI IN AGRICULTURE

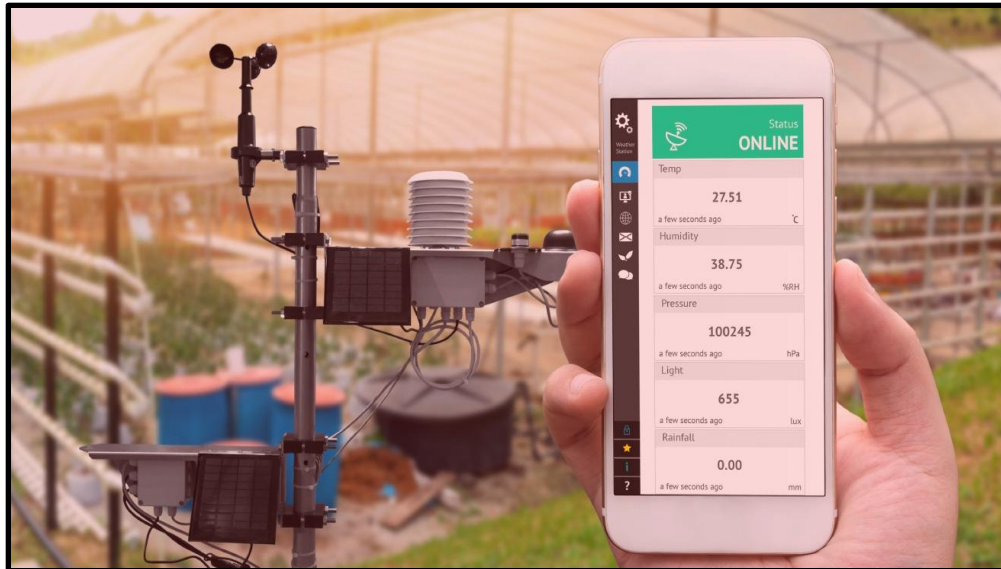


Agriculture plays a significant role in the economic sector. The automation in agriculture is the main concern and the emerging subject across the world. The population is increasing tremendously and with this increase the demand of food and employment is also increasing. The traditional methods which were used by the farmers were not sufficient enough to fulfill these requirements. Thus, new automated methods were introduced. These new methods satisfied the food requirements and also provided employment opportunities to billions of people. Artificial Intelligence in agriculture has brought an agriculture revolution. This technology has protected the crop yield from various factors like the climate changes, population growth, employment issues and the food security problems. The main concern of this presentation is to audit the various applications of Artificial intelligence in agriculture such as for irrigation, weeding, spraying with the help of sensors and other means embedded in robots and drones.

**G PRATHUSHA**  
**17RHIA0242**



## ANALYSIS OF CLIMATIC CONDITION USING IOT



Analysis of climatic conditions can be used by every farmer to estimate that heavy rainfall. Farmers will get the analysis of climatic changes. Through this, farmers can examine the possibility of heavy rain and take the preventive measures to protect the crop. Our basic idea is to provide information to farmers about rain storms by analyzing weather conditions. To resolve crop loss problems due to heavy rains, we had a solution of Analyzing weather condition using IOT. Analysis of climatic conditions will make the farmers farming process easy. This idea can analyze weather condition and it will alert the farmers about faulty weather. Extreme rainfall has been known to cause heavy damage to a wide range of crops. With help of analysis of climatic conditions, farmers can examine the rain storm and protect the crop from heavy rain falls. By using a sensor like DTH11, Rain sensor..Etc, we can analyze the climate changes.

**K SAILAJA**  
**16RHIA0227**



## THE FLOOR TILES THAT USE FOOT POWER TO LIGHT UP CITIES



UK-based start up Pavegen is harnessing the power of footsteps, engineering special flooring and embedded generators to recover kinetic energy from walking and running. The Pavegen floor tiles, now in their third iteration, depresses up to one centimetre when they are trod upon. The contacts between human feet and ground surface is created during the walking. The forces experienced by human feet upon landing on the ground can generate a renewable energy known as kinetic energy. This energy can be converted into electricity through a footstep power generator.

An unnoticeable downward movement of 5mm generates up to 7 watts of power over the duration of a footstep, enough, on scale, to power low-voltage local applications. Pavegen has built tiles that generate kinetic power from footsteps. Basically, if you walk on one, your step can help light soccer fields in Brazil and Nigeria, a hallway in Heathrow Airport or offices and shopping centres in London -- all locations where these tiles have been installed.



**K SRAVANI**  
**17RH5A0210**

## E-WASTE



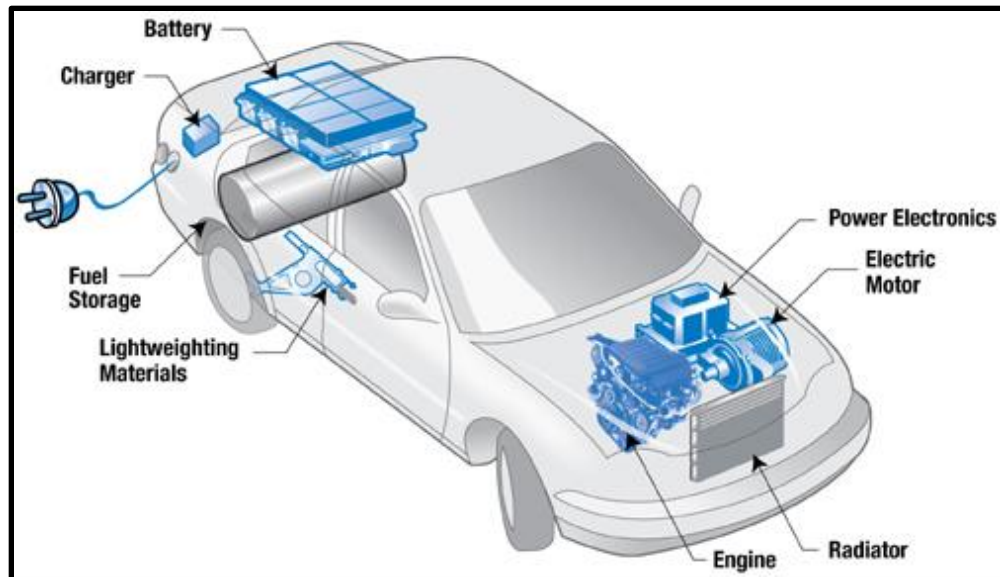
"E-waste" is a popular, informal name for electronic products nearing the end of their "useful life." E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to human health and environment. Discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem. This paper highlights the hazards of e-wastes, the need for its appropriate management and options that can be implemented. Under the Environment (Protection) Act 1986, central and state governments can enact legislations to safeguard the environment and people from exposure to toxic and hazardous nature of waste. Any violation of the provision of this act or notified rules is liable for punishment.



**K PADMAVATHI**  
**17RHIA0243**



## HYBRID ELECTRIC VEHICLE

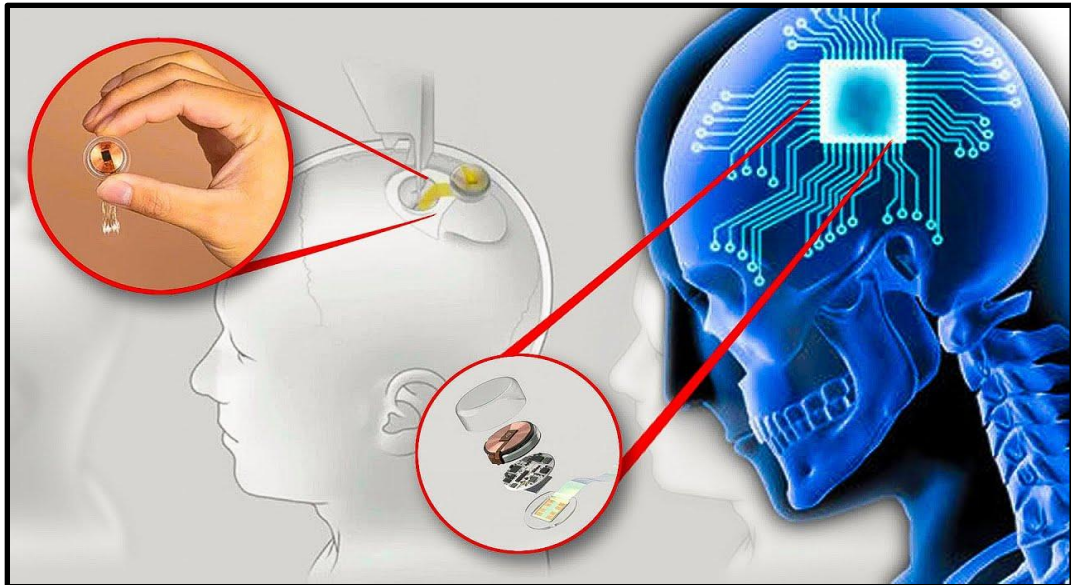


A Gasoline - Electric Hybrid Engine vehicle is a vehicle which works on electric power as well as fuel like petrol. It has many benefits over its predecessors, which developed power using only fuel. The thought is to design and construct the electric vehicle (HEV) powered by battery as well as petrol. The vehicle is made dynamic in nature by making use of electric power from battery and the fuel power. It consumes less fuel comparatively less pollution as compared to convention vehicles. Hybrid electric vehicle consists of a battery, to drive the electric motor and power system with an IC engine to increase fuel economy reduce harmful emissions from the exhaust. Also there is a provision for recharging the battery using a generator which is run using a turbine, which runs on the exhaust of the IC engine. In HEV, the battery single handedly provide power for driving at a low speeds where the efficiency of the IC engine is least. In cruising and high load conditions like moving up the hill, the electric power assists the engine by providing the additional power. Thus the HEV is the best alternative in areas with the high traffic like urban metropolitan cities.



**J. BINDHU**  
**16RH1A0217**

## NEURALINK CHIP



Neuralink chip can be implemented in human brain and linked to a computer. This chip will monitor and potentially stimulate brain activity. For this the bio tech company has been carrying several tests on monkeys. It is helpful to persons who have less neurons in brain. It comes into action when neurons stop their functioning. It has super fast technology. The chip stores the data and human becomes a super robot with same body. The chip is inserted in brain with a special robot, and can be removed with the help of same robot. **Neuralink Corporation** is a neurotechnology company that develops implantable brain-machine interfaces (BMIs). Co-founded by Elon Musk, the company's headquarters is in the Pioneer Building in San Francisco sharing offices with OpenAI. Neuralink was launched in 2016 and was first publicly reported in March 2017. Since its founding, the company has hired several high-profile neuroscientists from various universities. By July 2019, it had received \$158 million in funding (of which \$100 million was from Musk) and was employing a staff of 90 employees. At that time, Neuralink announced that it was working on a "sewing machine-like" device capable of implanting very thin (4 to 6  $\mu\text{m}$  in width) threads into the brain, and demonstrated a system that read information from a lab rat via 1,500 electrodes. They had anticipated starting experiments with humans in 2020; but have since moved that projection to 2022.



**S MAHALAKSHMI**  
**18RH5A0203**

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IMPORTANT WEBSITES

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[www.ieee.org/india](http://www.ieee.org/india)

[www.engineering.careers360](http://www.engineering.careers360)

[www.technologyreview.com](http://www.technologyreview.com)

[www.mathworks.in/products/matlab/](http://www.mathworks.in/products/matlab/)

[www.microwaves101.com/](http://www.microwaves101.com/)

[www.eee.utoronto.ca/student-life-links](http://www.eee.utoronto.ca/student-life-links)

<https://www.eee.org/>

[Science Commons.org](http://Science.Commons.org)

[MathGV.com:](http://MathGV.com)

<http://www.engineeringchallenges.org/>

<http://engineering.stanford.edu/announcement/stanford-announces-16-online-courses-fall-quart>

<http://www.tryengineering.org/>

<http://www.engineergirl.org/>

<http://www.discoverengineering.org/>

<http://www.eng-tips.com/>

<http://electricalbaba.com>

<http://efymagonline.com/>

<http://circuitglobe.com>

[www.techdoct.com](http://www.techdoct.com)

[www.howstuffworks.com](http://www.howstuffworks.com)

<http://nptel.iitm.ac.in>

<http://www.opencircuitdesign.com/>

<http://www.futuresinengineering.com/>

# ELEKTOR



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