# 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 | Band – Excellent, National Ranking by ARIIA**

Maisammaguda, Dhulapally, Secunderabad – 500 010, Telangana

## A.Y : 2023-24 VOL.1

Under

Student Chapter IEEE, IETE & Technical Association Electro Spikes

# TECHNITRONIX

**HALF-YEARLY TECHNICAL MAGAZINE**

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

## ECE

www.mallareddyecw.com

**Editorial Board members**

- Dr. Y. Madhavee Latha, Principal,Chairperson
- Dr. Sudhakar K, HOD
- Dr. N.L.Aravinda , Assoc.Professor
- Mr.S.Srikanth , Assistant Professor

## DEPARTMENT VISION

Vision

- To establish the Department of Electronics and Communication Engineering as a center of excellence, nurturing a culture of innovation, continuous learning and research.
- To impart students with a strong foundation in technical knowledge, practical skills, analytical thinking, and problem-solving abilities., empowering them to contribute to technological advancements and enhance the quality of life in society.

## DEPARTMENT MISION

Mission

- To create an academic environment that empowers students with strong technical knowledge and critical thinking abilities essential for success in the field of electronics and communication engineering.
- To inculcate a culture of innovation and research, enabling our graduates to effectively contribute to technological advancements and meet the constantly changing demands of industry and society.
- To Impart technical education with a strong emphasis on dignity, decency, and discipline to develop professional engineers who are both technically competent and socially responsible.

## ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering (ECE), with an intake of 120 students in the B.Tech program, also offers an M.Tech program in Embedded Systems.

The department features state-of-the-art laboratories equipped with the latest software, including CADENCE, MATLAB, XILINX, CCSTUDIO, KEIL, RTOS, RT Linux, OSCAD, PSPICE, and Multisim etc. It has been recognized as a Research & Development (R&D) Center by JNTUH. The department is supported by a team of well-qualified and experienced faculty members with 100% ratification.

The department has established IEEE, IETE, and ISTE student chapters, under which it organizes the National Level Technical Symposium – FUTURE SASTRA and the State Level Technical Symposium – MEDHA every academic year. Additionally, it publishes the technical e-magazine "TECHNITRONIX," the newsletter "ELECTROPULSE," and the project magazine "CIRCUITS AND INNOVATIONS."

The department regularly organizes the International Conference on Signal Processing, Communications, and System Design (ICSPCOM-SD). It also conducts Short-Term Training Programs (STTPs) and Faculty Development Programs (FDPs) on emerging technologies.

To enhance students' overall performance, the department holds weekly student seminar sessions (two hours per week) for B.Tech students from the first to fourth year. It also offers value-added certification courses such as CISCO certification through the Center for Development of Communication Skills. Additionally, the college provides Campus Recruitment Training (CRT) programs in collaboration with TIME and Coign Institutions.

The department has received MODROBS funding from AICTE for the establishment of VLSI Lab and Advanced Communications Lab. Furthermore, the department publishes a registered journal, "International Journal of Research in Signal Processing, Computing, and Communication-System Design (IJRSCSD)," with ISSN: 2395-3187.

## PO'S

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

## PSO'S

**The graduates of the department will attain:**

**PSO1:** The ability to analyze, design and implement application specific electronic system for complex engineering problems for analog, digital domain, communications and signal processing applications by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.

**PSO2:** The ability to adapt for rapid changes in tools and technology with an understanding of societal and ecological issues relevant to professional engineering practice through life-long learning

**PSO3:** Excellent adaptability to function in multi-disciplinary work environment, good interpersonal skills as a leader in a team in appreciation of professional ethics and societal responsibilities.

## 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 Electronics and Communication 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 ECE department of MRECW are bringing out the volume-1 of the Technical magazine Technitronix in A.Y 2023-24. 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 ECE, MRECW for bringing out the issue of the prestigious quarterly department technical Magazine Technitronix under A.Y: 2023-24, 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. Madhavee Latha**

Principal

## HOD'S MESSAGE

It is an occasion of great pride and satisfaction for the department of ECE, MRECW to bring out the issue of the quarterly of the Technical magazine Technitronix under A.Y:2023-24, 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

**Dr . K. Sudhakar**

HOD

## SCIENTIST OF THE HALF YEAR

# AROGYASWAMI PAULRAJ

Arogyaswami Paulraj, an Indian-American electrical engineer, has left an indelible mark on the world of wireless communication. His groundbreaking work on Multiple Input Multiple Output (MIMO) technology has revolutionized the way we communicate, enabling faster, more reliable, and efficient data transfer. This essay delves into Paulraj's life, achievements, and contributions to the field of electrical engineering.Early Life and EducationBorn on April 26, 1944, in Coimbatore, India, Paulraj's fascination with electrical engineering began at a young age. He earned his Bachelor's degree in Electrical Engineering from the Indian Institute of Science (IISc) in 1966. Later, he pursued his Master's and Ph.D. in Electrical Engineering from Stanford University in 1973 and 1978, respectively.Career and ResearchPaulraj's research career spanned over three decades, with stints at the Naval Research Laboratory (1978-1986) and Stanford University (1987-present). At Stanford, he founded the Smart Antennas Research Group, which became a hub for innovative research in wireless communication. His work focused on developing smart antenna systems, which efficiently utilize spectrum and improve wireless communication.MIMO Technology BreakthroughPaulraj's pioneering work on MIMO technology transformed the wireless communication landscape. By using multiple antennas, MIMO increases communication capacity and reliability, enabling faster data transfer rates. This technology has become a cornerstone of modern wireless communication systems, including 4G, 5G, and Wi-Fi.Awards and RecognitionPaulraj's contributions have been recognized globally. He received the prestigious Marconi Award in 2014, considered the "Nobel Prize of Communication." He is a member of the National Academy of Engineering (NAE) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). In 2018, he was awarded the Padma Shri, India's fourth-highest civilian honor.

## FACULTY ARTICLES

# PAPER BATTERY

Lithium-ion batteries using flexible paper-based current collectors have been developed. These current collectors were fabricated from wood microfibers that were coated with carbon nanotubes (CNT) through an electrostatic layer-by-layer nanoassembly process. The carbon nanotube mass loading of the presented (CNT-microfiber paper) current collectors is 10.1 μg/cm 2 . The capacities of the batteries made with the current collectors are 150 mAh/g for lithium cobalt oxide (LCO) half-cell, 158 mAh/g for lithium titanium oxide (LTO) half-cell, and 126 mAh/g for LTO/LCO full-cell. The fabrication approach of the CNT-microfiber paper current collectors, the assembly of the batteries, and the experimental results are presented and discussed. Paper batteries, also known as paper-based batteries, are innovative, eco-friendly energy storage devices. They combine traditional paper with electrochemical components, offering a sustainable alternative to traditional batteries. These thin, flexible batteries are made from cellulose-based paper, carbon nanotubes, and electrolytes.The advantages of paper batteries are numerous. They are environmentally friendly, made from recyclable and biodegradable materials. Production costs are significantly lower than traditional batteries, making them a cost-effective option. Additionally, paper batteries are flexible and lightweight, ideal for wearable technology and portable devices. They also boast high energy density and power, comparable to traditional lithium-ion batteries, while being safe and non-toxic.Paper batteries have various applications, including wearable technology, portable electronics, medical devices, electric vehicles, smart packaging, and disposable diagnostics. Researchers are exploring different types of paper batteries, such as paper-based lithium-ion batteries, supercapacitors, fuel cells, and zinc-air batteries.

**MS.H.BHAGYA LAXMI**
Department of ECE

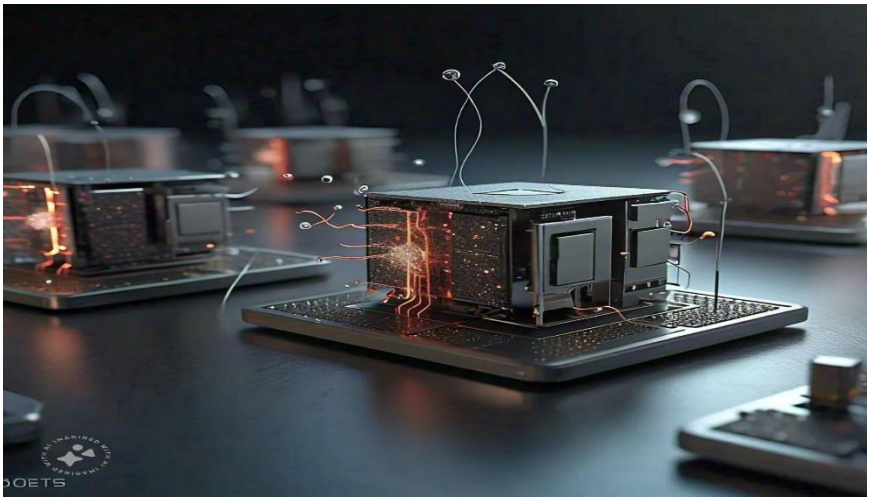
# ARTIFICAL PHOTOSYNTHESIS

We developed a cell-free artificial photosynthesis platform conducting both light and dark reactions for harvesting light energy and transforming the energy to organic compounds. To the best of our knowledge, such a device had not been reported so far. This system was able to harvest light energy and transform the energy to organic compounds, mimicking a plant leaf. We integrated the “artificial leaves” on a PCB demonstration board to create a compact energy harvesting system with a promising efficiency. Artificial photosynthesis is a groundbreaking technology that replicates nature's photosynthetic process to convert sunlight into chemical energy, producing clean, sustainable fuels, chemicals, and electricity. This innovative approach utilizes nanomaterials, catalysts, and photoelectrochemical cells to mimic photosynthesis.The artificial photosynthesis process involves three stages: light absorption, water splitting, and carbon capture. Light absorption captures sunlight using photovoltaic materials or dyes. Water splitting uses absorbed light energy to split water molecules into hydrogen and oxygen. Carbon capture converts CO2 into organic compounds, such as fuels, chemicals, or pharmaceuticals. Artificial photosynthesis offers numerous benefits, including renewable energy production, carbon sequestration, sustainable fuel generation, reduced greenhouse gas emissions, and potential mitigation of climate change. Its applications extend to hydrogen fuel production, solar fuels and chemicals, bio-inspired solar cells, carbon capture and utilization, and artificial photosynthetic organs.

**Mr.K.NAGA DASHARATH**

Department of ECE

# SPINTRONICS



Spintronics is an emergent technology that exploits the quantum propensity of the electrons to spin as well as making use of their charge state. The spin itself is manifested as a detectable weak magnetic energy state characterised as ―spin upǁ or ―spin downǁ. Conventional electronic devices rely on the transport of electrical charge carriers – electrons – in a semiconductor such as silicon. Now, however, device engineers and physicists are inevitably faced the looming presence of quantum mechanics and are trying to exploit the spin of the electron rather than its charge. Devices that rely on the electron‘s spin to perform their functions form the foundations of spintronics (short for spin-based electronics), also known as magnetoelectronics. Spintronics devices are smaller than 100 nanometre in size, more versatile and more robust than those making up silicon chips and circuit elements. The potential market is worth hundreds of billions of dollars a year. Spintronics burst on the scene in 1988 when French and German physicists discovered a very powerful effect called Giant Magnetoresistance (GMR). It results from subtle electron-spin effects in ultra-thin multilayers of magnetic materials, which cause huge changes in their electrical resistance when a magnetic field is applied. This resulted in the first spintronic device in the form of the spin valve. The incorporation of GMR materials into read heads allowed the storage capacity of a hard disk to increase from one to 20 gigabits. In 1997, IBM launched GMR read heads, into a market worth around a billion dollars a year. The field of spintronics is relatively young and it is difficult to predict how it will evolve. New physics is still being discovered and new materials being developed, such as magnetic semiconductors and exotic oxides that manifest an even more extreme effect called Colossal Magnetoresistance

**MS.G.ANUSHA**
Department of ECE

STUDENT ARTICLES

# IMPLEMENTATION OF MOVABLE ROAD DIVIDER

Road Divider is generically used for dividing the Road for ongoing and incoming traffic. This helps keeping the flow of traffic. Generally, there is equal number of lanes for both ongoing and incoming traffic. For example, in any city, there is industrial area or shopping area where the traffic generally flows in one direction in the morning or evening. The other side of Road divider is mostly either empty or under- utilized. This is true for peak morning and evening hours. This results in loss of time for the car owners, traffic jams as well as underutilization of available resources. Our idea is to formulate a mechanism of automated movable road divider that can shift lanes, so that we can have more number of lanes in the direction of the rush. The cumulative impact of the time and fuel that can be saved by adding even one extra lane to the direction of the rush will be significant. With the smart application proposed below, we will also eliminate the dependency on manual intervention and manual traffic coordination so that we can have a smarter traffic all over the city.

)**S.KALYANI** (21RH1A04P1)
**SP.SATHWIKA** (21RH1A04P0)
**U.SHIVANI** (21RH1A04Q5)

# AIR PURIFICATION DEVICE

Indoor air pollution poses a significant threat to human health, with adverse effects ranging from respiratory ailments to cardiovascular diseases. In response to this pressing issue, this project aims to develop an innovative air purification device capable of efficiently removing indoor air pollutants, thereby enhancing indoor air quality and promoting healthier living environments. The device utilizes advanced filtration technology coupled with smart sensors for real-time monitoring and control. Through rigorous testing and optimization, our goal is to produce a cost-effective, energy-efficient solution that can be readily deployed in residential, commercial, and industrial settings. This abstract provides an overview of the project objectives, methodology, and expected outcomesThe AirPure device is a cutting-edge air purification system designed to eliminate pollutants and contaminants from indoor air. Utilizing advanced technologies, including HEPA filtration, UV-C light disinfection, and activated carbon adsorption, AirPure captures 99.97% of particles as small as 0.3 microns, removing dust, pollen, smoke, bacteria, viruses, and volatile organic compounds (VOCs)..

**ISLAVATH ASHRITHA**
21RH1A0497
IV-ECE-B

# OMICRON:DESIGN OF SWARM ROBOT WITH WIRELESS COMMUNICATION

This work focuses on the issue of designing, constructing, and programming an individual robot within a robotic swarm. It also provides a brief overview of the swarm robotics and development of robotics, its methods, and characteristics. The mutual interaction between humans and robots is based on communication between them. This approach is applied in swarm robotics, not only between humans and machines but also among machines themselves. This paper will offer an overview about the relations between concepts, knowledge, and principles of swarm robotics. This research presents the design and development of a swarm robotics system with wireless communication, enabling collective behavior and cooperative task execution. The proposed system consists of multiple autonomous robots equipped with wireless communication modules, GPS, and sensors. A decentralized control architecture facilitates communication, coordination, and decision-making among robots. The design of a swarm robotics system with wireless communication enables collective behavior and cooperative task execution among multiple autonomous robots. This system features a decentralized control architecture, facilitating communication, coordination, and decision-making among robots. Each robot is equipped with wireless communication modules, GPS, and sensors, allowing for real-time communication and coordination.

**RAJPUT.POOJITHA SINGH** (21RH1A04L5)
**SABAVATH.SRILATHA** (21RH1A04M5)
**THOTA.DIVYA** (21RH1A04P7)

# RAILWAY HAZARD MITIGATION SYSTEM

The goal of the Railway Hazard Mitigation System (RHMS), a significant development in railway safety technology, is to identify and reduce the hazards related to railway operations. This thorough manual clarifies RHMS's architecture, operation, and deployment, emphasizing the key elements and their interconnected features. Modern sensors, such as infrared and ultrasonic ones, are at the core of RHMS. They are further supported by an LCD, a buzzer, and a dependable power supply unit (RPS). These sensors act as the system's watchful eyes and ears, constantly scanning the railway environment for possible dangers like obstructions in the path of trains, break-ins, or other safety violations. When such dangers are identified, the system immediately notifies railway staff and other relevant parties using audio alerts and visual signals on the LCD. The RPS guarantees continuous operation, which is essential for preserving the dependability of the system in challenging railway conditions. By carefully examining RHMS's features, installation methods, operating manuals, and possible improvements, this documentation seeks to provide railway operators, engineers, and safety specialists with the information and tools required to successfully install and maintain RHMS. RHMS is evidence of our dedication to improving railway safety and clearing the path for safer and more effective railway operations

SHAHANA MUSKAN-21RH1A04N2
MAHESHWARI -21RH1A04P9
SADHUGUNA -21RH1A04R7
VAISHNAVI -21RH1A0422

# GARBAGE COLLECTION ROBOT ON THE BEACH USING WIRELESS COMMUNICATION

The garbage collection robot on the beach using wireless communications the robot is built on the caterpillar wheels, sizes 52x74x17 cm and the power is supplied from 12V 30Ah battery which is connected to 40W solar cells. The user can control a robot via a program developed from Visual Basic 2005 application based on Window XP. The commands from user are sent via blue tooth to PIC18F4550 for processing. In addition, it is also equipped with an IP camera with added pan/tilt capabilities which relays feedback information to the human operator via Ad-hoc system. The results of robot performances were found that the robot can move with an average speed of 0.5 meters per second on the sand via wireless communication and collect the big garbage with side 12.5 x 49 cm, for example, glass bottles, and plastic, etc. From the experimental results, it can clearly indicate that the proposed robot is superior to handle tasking conveniently, control capability, and operate environmentally friendly.

**J.BHAVANI**
21RH1A0409
IV-ECE-B

# ELECTRONIC BIOMETRIC VOTING MACHINE

The Electronic Biometric Voting Machine (EBVM) is a secure, efficient, and user-friendly system designed to revolutionize the electoral process by integrating biometric identification technologies with traditional electronic voting mechanisms. This system addresses issues of voter fraud, impersonation, and unauthorized voting by utilizing biometric features such as fingerprints, facial recognition, or iris scans for voter authentication. Each voter's biometric data is securely stored and verified in real-time, ensuring that only eligible voters can cast their ballots.

The EBVM enhances the transparency and integrity of the voting process by minimizing human errors, reducing the need for manual intervention, and providing tamper-proof digital records. Its interface is designed to be intuitive, allowing users of varying technical literacy to interact with the machine seamlessly. Additionally, the system is built with robust encryption techniques to protect voter privacy and prevent unauthorized access to sensitive data.

**GUNDEDI SAHITHI**
20RH1A0489
IV ECE B

# CHILD RESCUE SYSTEM FROM OPEN BOREWELLS

In India for past few days people are facing a distressed cruel situation like child have fell in the bore well and struck in the hole which is uncovered and getting trapped. Rescue of trapped child from bore well is very risky and difficult process when compared to the other accidents. The currently available systems to save the child are less effective and costly too. It takes more than a day to save the child. Here, the child who is stuck inside the hole is to be saved by the clipper which pick and place the child with the help of remote controller. The clipper is left inside manually by the rope tied up at its hands. In this alternative scenario there will not be any requirements of digging hole parallel to the bore well. It also consists of camera which is affixed to the clipper which is used for monitoring the child. By this camera we get the visuals of the child and their condition.

**L.MOUNIKA**
21RH1A0496
IV-ECE-B

# IOT BASED SMART FARMLAND USING DEEP LEARNING

The IoT based Smart farmland using deep learning is a system for tracking animals on agricultural land combines surveillance cameras, drones, an Arduino controller, IR sensors, and an LCD display to detect and tally the animal's presence. Upon detection, the system utilizes AI methods to categorize the animal type and send immediate SMS notifications to farmers through a GSM module. It incorporates an animal-repellant buzzer and a gate control mechanism. Through the use of transfer learning with CNN models, it accurately identifies four specific animal species: elephants, cows, goats, and pigs. Continuous updates and training with new data maintain its precision, serving the agricultural and wildlife protection domains. This technology significantly aids farmers in safeguarding their crops, offering crucial insights into intrusions and amplifying crop yield. Its primary purpose revolves around simplifying the identification of animals on agricultural land.

**SARLA.NIKITHA** (21RH1A04N0)
**SASNOOL.MAMATHA** (21RH1A04N8)
**SONNAILA.APARNA** (21RH1A04N8)

# ORGANIC LIGHT EMITTING DIODE(OLED)

Emerging organic light-emitting diode (OLED)-based displays obviate external lighting, and consume drastically different power when displaying different colors, due to their emissive nature. This creates a pressing need for OLED display power models for system energy management, optimization as well as energy-efficient GUI design, given the display content or even the graphical-user interface (GUI) code. In this work, we study this opportunity using commercial QVGA OLED displays and user studies. We first present a comprehensive treatment of power modeling of OLED displays, providing models that estimate power consumption based on pixel, image, and code, respectively. These models feature various tradeoffs between computation efficiency and accuracy so that they can be employed in different layers of a mobile system. We validate the proposed models using a commercial QVGA OLED module and a mobile device with a QVGA OLED display. Then, based on the models, we propose techniques that adapt GUIs based on existing mechanisms as well as arbitrarily under usability constraints. Our measurement and user studies show that more than 75 percent display power reduction can be achieved with user acceptance.

Reference:https://ieeexplore.ieee.org/document/5989813

**M.CHARISHMA SRI**

23RH1A0473

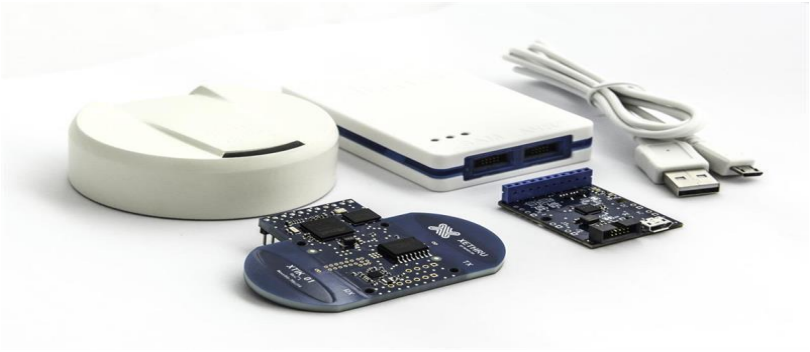
IIECE B

# AUTOMATIC STOP GATE AT BRIDGES FOR OVERFLOW


The Automated Bridge Overflow Protection System prototype is a cutting-edge solution designed to prevent flood-related accidents at bridges, ensuring commuter and community safety. Leveraging advanced technology, it detects water overflow, triggers alarms, and automatically closes gates, while sending SMS alerts with location coordinates to authorities for swift response. This comprehensive system enhances public safety, minimizes infrastructure damage, and provides real-time monitoring for effective flood mitigation. By integrating innovative technologies, it offers a reliable, cost-effective solution for flood-prone areas, improving public awareness, reducing economic losses, and enhancing emergency response capabilities. Its implementation can significantly mitigate flooding's devastating impacts, safeguarding lives, infrastructure, and communities, and revolutionizing flood management and disaster response.

**INDURI VARSHITHA**
21RH1A0493
IV-ECE-B

# DEEP BREATHE



Our product provides gas analyzers for environmental ambient air monitoring and detecting of toxic chemicals in and around your facility. Furthermore, it provides real-time monitoring and reporting of a chemical exposure. Therefore, enables your staff to respond to the situation quickly and accordingly. In addition, we designed to help maintain a safe place environment within your facility and provide a real-time cost-effective solution for monitoring trace toxic chemicals in field applications.

We can apply our idea in Industrial as well as Hospitals, Home, and highly populated cities in order to prevent ourselves from hazardous gases, present in the environment. This can be used in most populated and air-filled cities too. Our idea helps to create awareness among people about the type of environment they are covered with.

The term IoT stands for Internet of Things and it is the most significant as well as promising technology nowadays. Some of the researchers in the market estimated that there are a billion devices are connected with sensors like wearables, smartphones, etc. Currently, every sensor plays an essential role in the Internet of Things. These sensors are mainly used for detecting or monitoring the quality of air, health status, home security, etc. Similarly, these sensors are used in IoT for monitoring the process of production, so named as IoT sensor.

**M.SAI SHIVANI**

20RH1A04D9

III ECE

# AIR QUALITY MONITORING SYSTEM WITHIN THE CAMPUS BY USING WIRELESS SENSORS

The goal of the Air Quality Monitoring System is to provide real-time data on environmental conditions within a campus using Wireless Sensor Networks (WSNs). This system is designed to continuously monitor key air quality parameters such as temperature, humidity, and the concentration of harmful gases like carbon dioxide ($CO_2$ ), carbon monoxide (CO), and particulate matter (PM). Wireless sensor nodes are strategically placed across different locations on the campus, collecting and transmitting data to a central server via a wireless communication protocol. The data is then processed and displayed on a user friendly dashboard, allowing administrators and campus residents to track air quality levels in real time. Alerts are triggered if any parameter exceeds prede fined safe levels, ensuring timely action to mitigate risks. This system not only promotes a healthier living and learning environment but also enables data driven decision-making to improve campus air quality management. By providing a scalable, low-cost, and efficient solution, the Air Quality Monitoring System contributes to a safer and more sustainable campus environment

**G.NITHEESHA**
21RH1A0479
IV-ECE-B

# PIEZO ELECTRIC BUSES


Piezoelectric buses represent an innovative approach to sustainable transportation by harnessing the energy generated from vibrations and mechanical stress, typically from road surfaces. These buses are equipped with piezoelectric materials that convert kinetic energy produced during travel into electrical energy, which can be used to power onboard systems or recharge batteries. This technology not only enhances the energy efficiency of public transport but also contributes to reducing carbon emissions and reliance on fossil fuels. By integrating piezoelectric systems into urban infrastructure, cities can create a cleaner, more sustainable transit solution that aligns with global goals for renewable energy and environmental conservation.

**K.MEGHANA**
21RH1A04B0
IV-ECE-B

# TEMPERATURE BASED FAN SPEED CONTROLLER AND DC MOTOR USING BLUETOOTH

The electric drive systems should possess some benchmark properties like linear control, reliability and steady operation. DC driven machines gain some advantage in these aspects. The speed control methods of DC motor play a vital role in the performance of drive. The main purpose of speed controller is to focus on how we can use Bluetooth based device to control speed and direction of a DC motor at a desired speed and the main objective of dc drive is to maintain a system with the stable speed irrespective of load condition. In this paper, we describe a recently developed “Android based speed control of DC motor”, a smart phone control experimental setup that can be accessed via the Bluetooth. This setup consists of two basic primary elements communicating with each other: i) Bluetooth of smart phone which is connected to the 8051 microcontroller, IC and DC Motor interfaced with a motor driver IC and ii) a Bluetooth module. The smart phone sends/receives data to/from the microcontroller using the wireless technology via Bluetooth. An application based on Android is created and downloaded in the phone which acts as a display panel for the user to send/receive/view the input and output of the DC motor. In this paper visual display of the current position of the motor using sensors can be sent by the microcontroller to the smart phone. Our microcontroller based remote control methodology using an android based smart phone can be readily applied and control the speed of DC motor through it.

**T.SREEJA -21RH1A04Q1**
**V.VENNELA -22RH1A0427**
**R.MAHESHWARI -22RH1A0423**
**T.POOJA -22RH5A0425**

# AUTOMATIC PLANT WATERING SYSTEM

The Automatic Plant Watering System simplifies garden care, particularly for those often away from home. It uses a soil moisture sensor to monitor soil levels continuously. When moisture drops below a preset threshold, the system activates a solenoid valve to water the plant until the moisture level is adequate. Additionally, it includes humidity and temperature sensors to adjust watering based on environmental conditions. The system is controlled by an Arduino microcontroller, which processes data from the sensors to manage watering precisely. The Arduino GSM shield enhances functionality by sending SMS notifications to users. These updates include system status, watering reminders, and alerts for any issues. Remote control via SMS allows users to adjust settings or override the system from afar. This automated solution reduces manual effort, ensures efficient water usage, and provides convenient remote management, making garden maintenance more effective and hassle-free.

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**P.AKSHITHA -21RH1A04K9**
**V.SAI ANJANI -21RH1A04R3**
**V.RAMYASRI -22RH1A0426**
**K.PRANATI -20RH1A04A3**

# PUBLIC TRANSPORT CAPACITY CONTROLLER

Now days lots of accident happens that done due to overloading of the Buses in which the RTO will allowed the some number of seats but transports will overload the bus , auto with more which will causes accident some time so that we need to provide auto overload detection system In which the device will automatically detect the in and out count of passenger and if it get overhead then it will send notification to RTO and mark the time and location of that vehicle at that moment. I later that whole data help the RTO to completely analyze the vehicle. In inspection of vehicle the RTO will analyze the overloaded point and generate the find according that A public passenger transit system is complex, involving two types of traffic units passengers and vehicles. The system operation require supplying passengers with stations where they can access vehicles and travel between stations. These operations are subject to various capacity constraints, depending on the traffic type and situation in the system.The capacity constraints can be broken down into seven broad categories. Capacity of a station for interface with personal transport modes. These capacity constraints can interact in congestion gears, impairing capacity. Understanding these constraints is crucial for planning and operating a mass transit network to match the nature and size of operating resources to the volume of flow, subject to certain service quality objectives.

S.DEEPIKA -21RH1A04N9
SP.SATHWIKA -21RH1A04PO
S.KALYANI -21RH1A04P1
U.SHIVANI -21RH1A04Q5

# OPTICAL COMMUNICATION

In about ten years, efficient research and diligent technology have carried the field of optical communication to such a level that many systems operating with a wide range of requirements have been developed throughout the world. Thus, cables containing up to more than one hundred easy-to-splice multimode fibers can transmit thousands of telephone channels; injection lasers and light emitting diodes made of GaAlAs operating at about 0.85mu m can be directly modulated at rates as high as hundreds of MHZ; silicon PIN and the more sophisticated avalanche gain detectors, both with superb characteristics, are widely used. This research presents a novel optical communication system designed to achieve high-speed data transmission rates while ensuring low latency, high reliability, and improved spectral efficiency. The proposed system leverages advanced optical technologies, including wavelength division multiplexing (WDM), pulse position modulation (PPM), and coherent detection.

reference :https://ieeexplore.ieee.org/document/1123804

**R.PREETHI**

23RH1A0494

II ECE B

# PROXY SERVER

A proxy server acts as a middleman between a client and the internet, handling requests and responses to enhance privacy, security, and performance. By intercepting web traffic, proxy servers mask the user's identity, offering anonymity and safeguarding sensitive data. Proxy servers are categorized into different types, such as forward proxies, reverse proxies, transparent proxies, and anonymous proxies, each serving unique functions within a network. Organizations utilize proxy servers to monitor, control, and filter network traffic, ensuring secure access to the internet. Additionally, proxies improve network efficiency by caching frequently accessed data, thus reducing bandwidth usage and speeding up response times. They are also employed to bypass geo-restrictions, granting access to regionally blocked content. In cybersecurity, proxies play a pivotal role by examining traffic before it reaches the end user, blocking malicious content, and preventing potential attacks. However, they come with limitations, such as slower browsing speeds and the risk of data exposure if improperly configured. Despite these challenges, proxy servers are integral to modern network architecture, helping organizations manage internet access securely while maintaining performance and user anonymity.

Reference : https://ieeexplore.ieee.org/document/xxxxx

**SK.CHERISHMA**

24RH5A0416

II ECE B

# AUTOMATIC TEMPERATURE CONTROLLED FAN

Now-a-day's technology is running with time, it completely occupied the life style of human beings. Even though there is such an importance for technology in our routine life there are even people whose life styles are very far to this well known term technology. Temperature monitoring and control is important in industrial environments and also in the human living room. Industrial temperature monitoring is important in many applications and systems as excessive changes in the temperature can lead to detrimental effects and failure of operation. So it is our responsibility to design few reliable systems which can be even efficiently used by them. Automatic Temperature Controlled Fan Speed Controller is one of them. The developed system provides an environment in which no user needed to control the fan speed. Automatically controls the fan speed by sensing the room temperature. These fascinating efforts to create intelligent system are to provide human being a more convenient life. The circuit was designed using electronic components available in local market to keep the cost at low level.

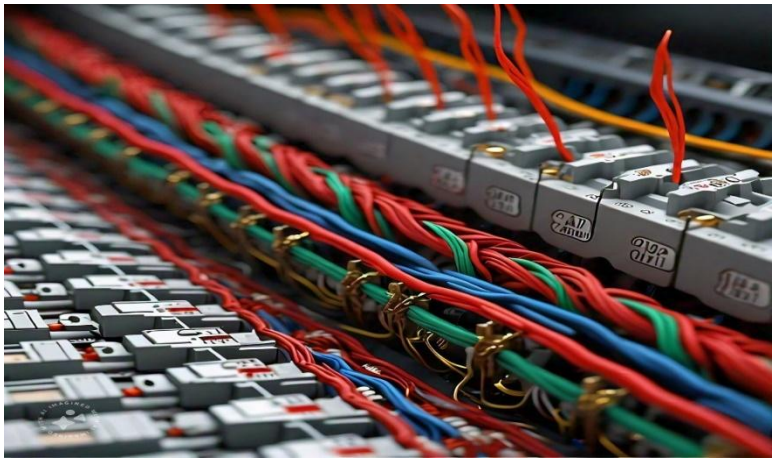
**G.LEKHANA**
20RH1A0497
III ECE B

# SMART E-VECHICLE MONITORING SYSTEM

The increasing adoption of electric vehicles ncessities advanced monitoring systems to ensure their safety ,effieciency,and longevity.This paper presents a smartmonitoring system designed specifically for electri vehicles ,incorporating temperatureand vibration sensors to detect and prevent potential failures in realtime .The system utilizestemperature sensors to monitor the thermal conditions of critical components such as the battery pack motor and power electronics ,overheating in these components can lead toreduced efficiency ,permanent damage ,or even hazardous situations .by continuosly tracking temperature variations ,the system can provide early warnings and take preventive actions such as adjusting cooling mechanisms or altering the driver The Intelligent E-Vehicle Monitoring System (IEVMS) is an innovative IoT-based solution designed to optimize electric vehicle (EV) performance, safety, and sustainability. IEVMS integrates real-time monitoring, data analytics, and machine learning algorithms to track key parameters such as battery health, charging status, energy consumption, speed, location, and environmental impact.

**L.PRANATHI** (22RH1A0404)
**CH.SAINIKHITHA** (22RH1A0410)
**B.RAMYA** (22RH1A0408)
**B.SHIVANI** (22RH1A0404)

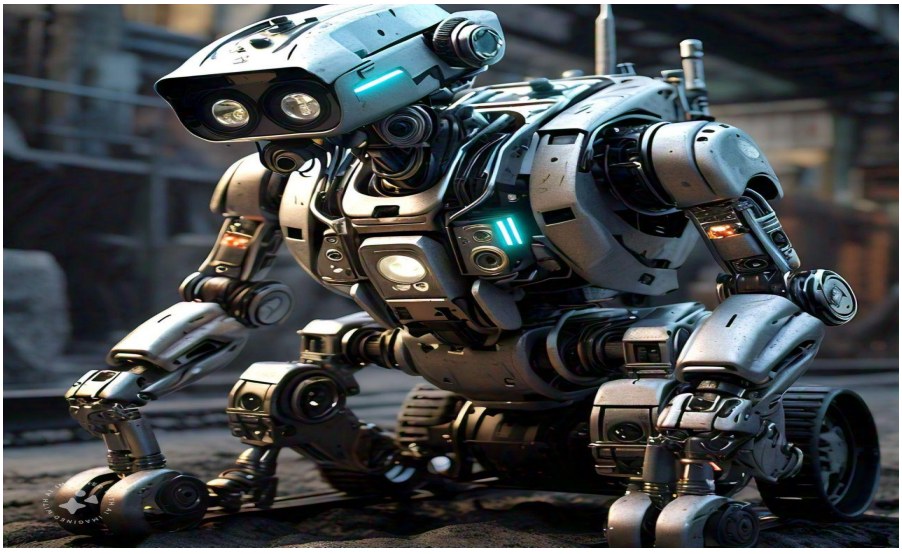
# FAULT TRACING OF WIRING



An engine is a machine that we use in our daily life. Be it a motorcycle or a car, everything contains an engine. In fact an engine forms the heart of these machines, as without it, a car won't move forward and a motorcycle won't stop.
How ever have u thought of inserting sensors near the engine so that we could sense the short circuit in the wiring I have seen many situations where people stop on highways as there car breakdowns and can't even know the problem . In brief When a wire gets short circuit in the vehicle the temperature sensor tests the temperature and gives the message to the LED so that we could identify the problem.One of the problem is also the break lights that person driving doesn't know that when he applied a break weather the light is on or not so to sense that wee insert a sensor to know that. Fault tracing of wiring is a critical process for identifying and resolving electrical issues in various industries. The WireTracker system utilizes advanced technologies, including machine learning algorithms, thermal imaging, and signal processing, to rapidly detect and locate faults in complex wiring systems.

**G SRI VYSHNAVI**
20RH1A0486
III ECE B

# COAL MINING SURVEILLANCE ROBOT



The increasing demand for coal, along with the inherent dangers of mining operations, calls for innovative solutions to enhance safety and efficiency. This project introduces a coal mining surveillance robot designed to monitor and analyze mining environments in real-time. Equipped with advanced sensors such as LIDAR, thermal imaging, and gas detectors, the robot can assess environmental conditions and identify potential hazards like gas leaks, rockfalls, and equipment malfunctions. It autonomously navigates challenging terrains, utilizing AI algorithms for data processing and providing actionable insights to mining operators. With a wireless communication system, it ensures seamless data transmission to a centralized monitoring station, facilitating timely decision-making. Its rugged design allows it to withstand harsh conditions, thereby minimizing human exposure to dangers. By integrating this technology into coal mining operations, the robot aims to improve safety, enhance operational efficiency, and support sustainability goals by optimizing resource extraction processes.

**P.AKSHITHA** (21RH1A04K9)
**V.SAI ANJANI** (21RH1A04R3)
**V.RAMYASRI** (22RH1A0426)
**K.PRANATI** (20RH1A04A3)

# WATER AVAILABILITY BASED CROP SPECIFICATION SOLUTION-IOT BASED IRRIGATION

Agriculture plays vital role in the development of agricultural country. In India about 70% of population depends upon farming and one third of the nation's capital comes from farming. Issues concerning agriculture have been always hindering the development of the country. The main problem that we are facing in today's agriculture are low productivity and over exploitation of scarce water resources. Huge waste of water resources damaging crop productivity, increasing soil salinity, and aggravating water shortages. 95% of India's water is used for irrigation. Due to over exploitation of water resources, there is no proper usage of water, most of water which is being used in agriculture is getting wasted offering low productivity of crops. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. Hence the project aims at making agriculture smart using IoT technologies

This project proposes an automated irrigation system which monitors and maintains desired soil moisture content via automatic watering. It uses soil moisture sensor which measures exact moisture level in soil. It also uses a rain sensor which is a switching device used to detect rainfall and control water flow from the pump. Microcontroller on Arduino mega platform is used to implement control unit. This enables the system to use appropriate quantity of water which avoids over/under irrigation. Soil moisture sensors measure or estimate the amount of water in the soil. Rain sensor is a water conservation device connected to an automatic irrigation system that causes the system to shut down in the event of rainfall. Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards can read inputs of soil sensors and rain sensors and turn it into an output-on 1LED display. Potentiometer is used to set a particular level

This project can be further developed using multiple sensors like PH sensor, Humidity sensor, Temperature sensor and others. This project can also be used as a source of security where the field could be fenced and it could protect the field from predators

**M.JYOTHSNA SUJANA**
20RH1A04F5
III ECE

## EVENTS-PHOTOGRAPHS

### ORIENTATION DAY – 2K23




### AWARENESS PROGRAMME ON HIGHER EDUCATION-ABROAD


## MEDHA – 2K23

## NSS – 2K23


# ENGINEERING DAY

## E-SUMMIT-2K23


## NATIONAL LEVEL HACKATHONS

## TEACHER'S DAY 2K23



## ALUMNI TALK

Placement Experience: from 3-2 semesters, students are eligible for campus placements. A number of organizations, including TCS, Infosys, Wipro, Accenture, and Capgemini, visit our college each year and choose a large number of students; placement rates at Mrecw are 100%.

**E SANDHYA**
18RH1A0455
B.Tech – 2022 Passed out

Throughout the journey I have learned a lot. It have provided me with some great opportunities which helped me improve myself in every aspect as a student, as a senior, as a friend and most importantly as a professional. Experience in MRECW have helped me sharpen my skills in my field of choice by providing fully equipped labs where I could practice and learn.

**N TANUSHRI**
18RH1A04E6
B.Tech -2022 Passed Out

Being a student coordinator in technical events was one of the best decisions I made in college. Organizing workshops and events helped me develop my leadership skills and connect with like-minded students. The sense of community and shared learning made my college experience truly enriching.

**T TEJASREE**
18RH1A04L7
B.Tech -2022 Passed Out

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