



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 : 2024-25 VOL.1

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

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: 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 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 Elektor in A.Y 2022-23. 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 first issue of the prestigious half yearly department technical Magazine Elektor in A.Y 2022-23, 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

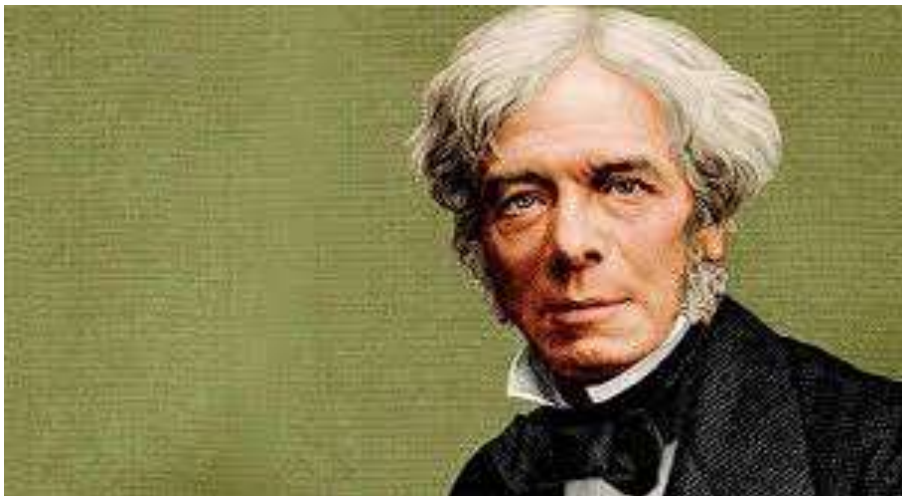
HOD'S MESSAGE

It is an occasion of great pride and satisfaction for the department of ECE, MRECW to bring out the first issue of the half yearly of the Technical magazine Elektor in A.Y 2022-23, it gives me immense pleasure to note that the response to the magazine has been overwhelming. 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. S. Vijaya Madhavi**

HOD

FEATURED SCIENTIST

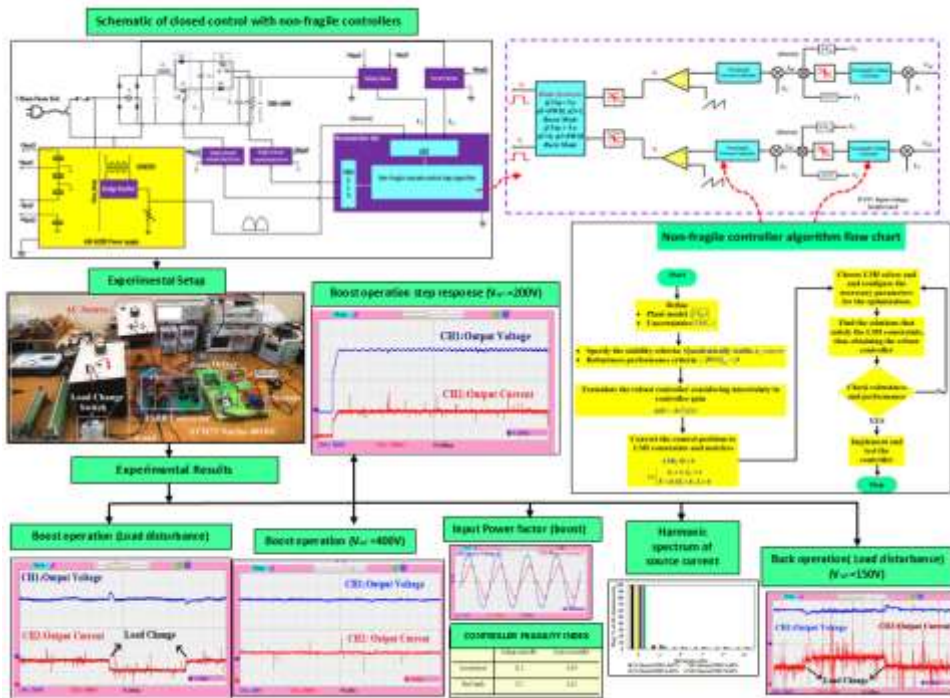


Michael Faraday

Michael Faraday (22 September 1791 – 25 August 1867) was an English scientist who contributed to the study of [electromagnetism](#) and [electrochemistry](#). His main discoveries include the principles underlying [electromagnetic induction](#), [diamagnetism](#) and [electrolysis](#). Although Faraday received little formal education, as a [self-made man](#), he was one of the most influential scientists in history.^[1] It was by his research on the [magnetic field](#) around a [conductor](#) carrying a [direct current](#) that Faraday established the concept of the [electromagnetic field](#) in physics. Faraday also established that [magnetism](#) could affect [rays of light](#) and that there was an underlying relationship between the two phenomena.^{[2][3]} He similarly discovered the principles of electromagnetic induction, diamagnetism, and the [laws of electrolysis](#). His [inventions](#) of [electromagnetic rotary devices](#) formed the foundation of electric motor technology, and it was largely due to his efforts that electricity became practical for use in technology.^[4] [Albert Einstein](#) kept a picture of Faraday on his study wall, alongside pictures of [Isaac Newton](#) and [James Clerk Maxwell](#).^[6] Physicist [Ernest Rutherford](#) stated, "When we consider the magnitude and extent of his discoveries and their influence on the progress of science and of industry, there is no honour too great to pay to the memory of Faraday, one of the greatest scientific discoverers of all time."

FACULTY ARTICLES

Design and practical implementation of non-fragile controller for non-isolated on-board battery charger for electric vehicle

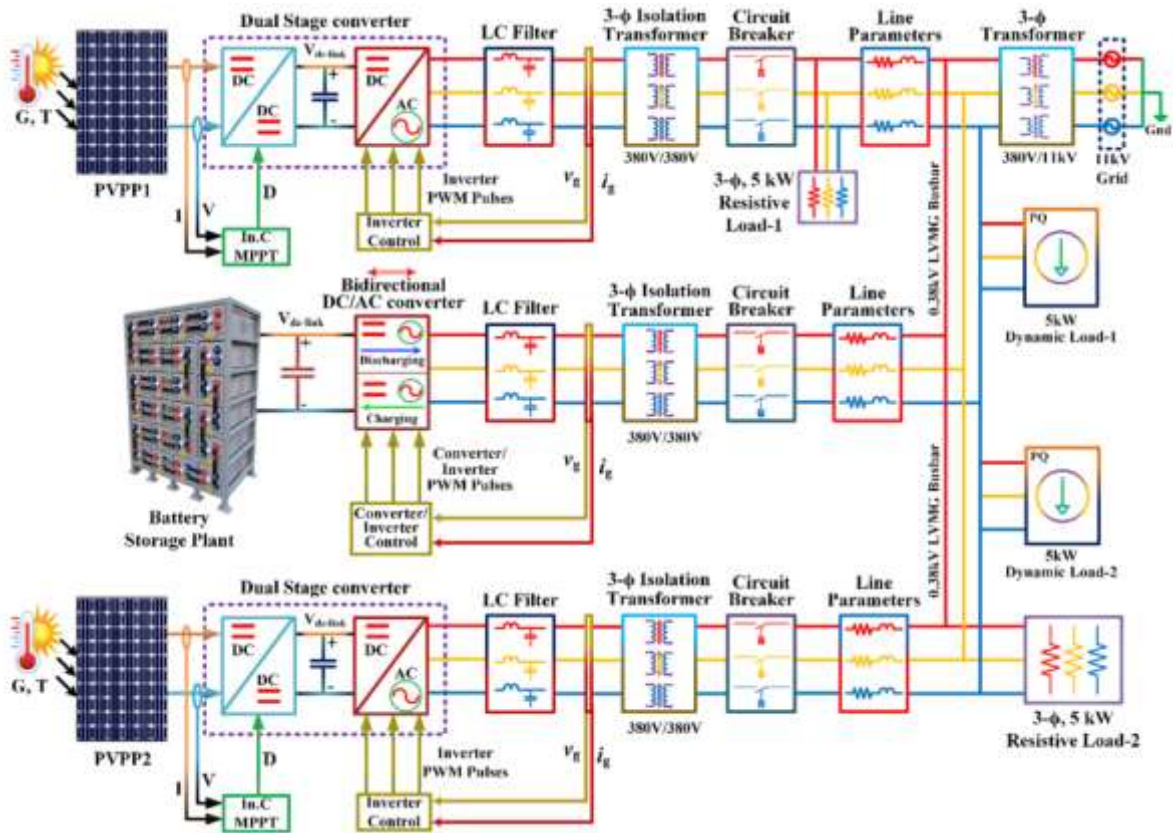


The article proposes a non-fragile control approach for a non-isolated two-switch buck-boost converter used as an on-board charger for electric vehicles. The control scheme is based on a cascaded two-loop configuration with non-fragile Proportional Integral controllers in the inner current and the outer voltage loop. The control approach is based on designing a control law that can stabilize the closed-loop system subject to uncertainties in the controller parameters while satisfying the H_∞ norm bound constraint on disturbance attenuation. The proposed control technique helps to deal with inevitable uncertainties during the implementation of any control scheme. The proposed control technique is compared with the conventional approach and validated through experimental results. The experimental results are obtained from a 1-kW laboratory prototype of a TSBB converter with an output voltage range of 150–400 V. The results demonstrate that the proposed approach effectively achieves good robustness against controller parameter variations and disturbances under various operating conditions.



Dr B Anil Kumar
Department of EEE

Power Management of PV-Battery-Based Low Voltage Microgrid Under Dynamic Loading Conditions



The PV power plants (PVPP) integrated with the low voltage microgrid's (LVMG) is one of the significant non-conventional sources of energy. In this article, power management of two PVPPs which are PVPP1 and PVPP2 along with the battery storage plant (BSP) is presented, and these are integrated with the LVMG. Each PVPP consists of an incremental conductance maximum power point tracking (InC MPPT) controller in order to maximize the power extraction and minimize the power losses under wide-varying irradiance (G) and temperature (T) conditions. A voltage source converter (VSC) is used to control the charging and discharging states of the BSP, and it is used to connect the BSP with the LVMG. This work deals with the frequency and voltage regulation of the LVMG by considering the dynamic loading conditions. The proposed PVPP's along with BSP will control power flow by load leveling to maintain the active power balance which will mitigate the current and voltage harmonics. The proposed system is designed and verified by the real-time simulations using MATLAB/Simulink software.



Dr. B. Rahul Wilson Kotla
Department of EEE

STUDENTS INNOVATIVE PRODUCT PROTOTYPE

Smart Helmet for Coal miners



A traditional model of the smart helmet has been produced to assist miners operating in the mining industry. Many risky incidents commonly occur in the mining sector, many of which result in life-threatening injuries or death. A miner's helmet is one of the most regularly used safety equipment for mine workers hence it must be loaded with some more advanced features. With the use of different sensors, the smart helmet will be able to identify catastrophic situations such as harmful gases like Carbon-Monoxide, CH₄, LPG, and natural gases. Whether the miner is wearing his helmet or not is detected by an infrared sensor. Each sensor has a critical value that, if exceeded, causes the buzzer to activate and the LEDs to illuminate, signalling the miners and supervisors. The GPS module fitted in the miners' helmets allows the mining officials to readily track their locations. Furthermore, a Panic Button has been implemented, which, when pressed, sends an emergency signal via mail to higher authorities outside the mines. A mobile application has also been created to display all of the data supplied wirelessly from the sensors. As a result, the proposed smart helmet protects miners from any upcoming accidents.

**K YASASWINI VAJRA**21RH1A0215
IV EEE

Smart solar powered grass cutter



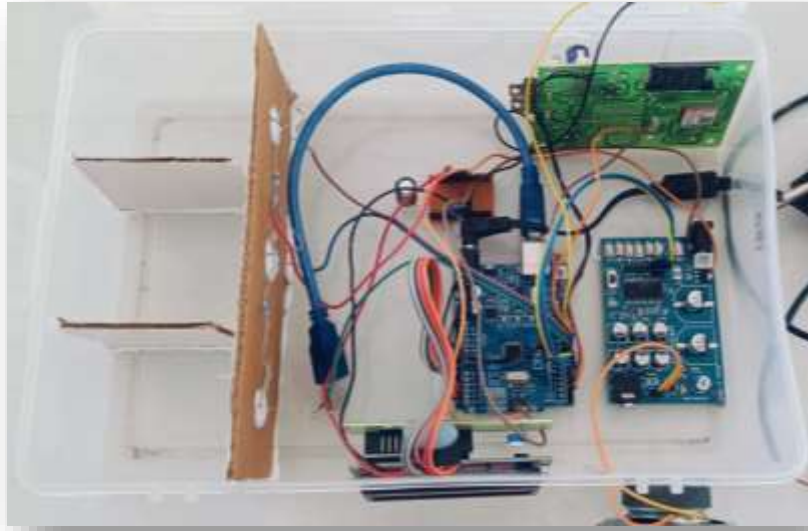
The Smart Solar Powered Grass Cutter is an innovative project designed to provide an efficient, environmentally friendly, and automated solution for lawn maintenance. This device harnesses solar energy to power its operation, significantly reducing the need for conventional power sources and contributing to a reduction in carbon footprint. Key features of the grass cutter include a variable head mechanism and an adjustable height function. The variable head allows the device to navigate and cut grass on uneven terrains effectively, ensuring a consistent trim across different landscape profiles. The height adjustment feature enables users to set the desired cutting height, allowing for customizable lawn care based on specific preferences or seasonal requirements. The smart functionality of the grass cutter is achieved through the integration of sensors and control systems that allow for autonomous operation. These sensors help the device detect obstacles and navigate around them, ensuring safety and efficiency. Additionally, the system can be programmed to operate at specific times or intervals, further enhancing convenience for the user. Moreover, the grass cutter includes a solar panel system that charges an onboard battery, ensuring continuous operation even during periods of low sunlight. The use of renewable energy sources not only makes the device cost-effective in the long run but also aligns with global efforts to promote sustainable living practices. The device is equipped with a user-friendly interface, which allows for easy monitoring and control. Through a mobile app or a dedicated remote control, users can adjust settings, monitor the grass cutter's performance, and receive alerts on maintenance needs or any operational issues. In terms of safety, the grass cutter is designed with multiple fail-safes and emergency stop features to prevent accidents and ensure reliable operation. The cutting blades are housed within a protective casing to avoid any potential harm to pets, children, or other objects in the lawn area. Overall, the Smart Solar Powered Grass Cutter represents a significant advancement in automated lawn care technology, combining sustainability, efficiency, and user-friendly features to meet the demands of modern gardening and landscaping.



A NAVYASRI

21RH1A0204
IV EEE

Automatic Pill Reminder: A Smart Solution for Timely Medication



Taking medication on time and in the correct dosage is crucial for effective treatment, but many people face challenges in adhering to their prescribed schedules. Two of the most common issues are misunderstanding dosage instructions and the inconvenience of rigid medication timings. To address these challenges, the Automatic Pill Reminder offers a practical solution designed to ensure timely and accurate medication intake, promoting better health outcomes. In today's world, chronic diseases are on the rise, often driven by unhealthy lifestyles. As a result, many people find themselves frequently visiting hospitals and relying on complex medication schedules. Unfortunately, missed doses or incorrect timings can worsen health conditions, making the situation even more complicated. This is where the Automatic Pill Reminder comes in—an innovative device that helps users stay on track with their medications. The device uses an Arduino microcontroller, which is a programmable platform that detects and interacts with the environment. Equipped with an LCD display, it provides clear instructions for each medication dose, reducing any chance of confusion. Additionally, a buzzer serves as an audible alert, ensuring users are reminded to take their medications. For added convenience, a GSM module sends message alerts to caregivers or family members, making it easier to monitor the patient's routine from a distance. A tilt sensor is also integrated to detect if the patient has taken the medication, providing an additional layer of accountability. Designed with a pill container and automatic dispenser, the device is compact, portable, and user-friendly, making it accessible for people of all ages. Its reliability and stability make it an economical solution to a widespread problem. The Automatic Pill Reminder is especially beneficial for elderly patients, who often require extra care and attention. This system allows them to manage their medications independently while still receiving necessary support from family or caregivers. In terms of performance and quality, the Automatic Pill Reminder stands out as a dependable tool for everyday healthcare needs. It combines modern technology with ease of use, providing peace of mind for patients and their loved ones alike. Whether it's for managing chronic conditions or ensuring regular medication intake, this device is a valuable ally in maintaining health and well-being.



J HIMA BINDU

21RH1A0213
IV EEE

Revolutionizing Rehabilitation: The Smart Assistance Glove for Paralysis Patients



Paralysis patients face numerous challenges when it comes to mobility and rehabilitation. Traditional methods often fall short in providing continuous support and effective monitoring. Addressing these limitations, the Smart Assistance Glove leverages advanced IoT technology to enhance mobility, facilitate rehabilitation, and enable real-time monitoring—offering a comprehensive, tech-driven solution for improved patient outcomes. This innovative glove integrates a range of smart features specifically designed to meet the needs of paralysis patients. Equipped with flex and pressure sensors, the glove can detect finger movements and applied pressure, allowing it to respond effectively to the user's needs. For added functionality, servomotors assist with finger movements, enabling tasks such as grasping objects, writing, or typing. Additionally, vibration motors provide haptic feedback, enhancing user interaction and encouraging engagement. The Smart Assistance Glove isn't just an aid for physical tasks; it also serves as a powerful tool for rehabilitation. Customizable exercise programs are available through a user-friendly mobile app, which offers real-time feedback on the patient's progress. Data from each session is stored on a secure cloud platform, allowing healthcare providers to monitor and track improvement over time. To further enhance usability, the system includes voice control for hands-free operation, making it easier for patients to navigate settings without assistance. With Bluetooth and Wi-Fi connectivity, the glove seamlessly communicates with external devices and IoT platforms, enabling easy access to data and remote control. This IoT-based glove redefines rehabilitation for paralysis patients, providing a practical, accessible, and interactive solution that supports mobility, tracks progress, and enhances the overall recovery process. Through the Smart Assistance Glove, patients gain not only a tool for daily tasks but also a trusted companion on their journey toward greater independence.



K POOJITHA

22RH1A0213

IV EEE

Securing Exam Papers: An Innovative System for Tamper Detection and Access Control



Exam paper security is paramount in maintaining the integrity of academic assessments. Recognizing the critical need to prevent unauthorized access, this project introduces a cutting-edge system designed to detect tampering with sealed exam papers using RFID technology and advanced tamper-detection mechanisms. At the heart of the system are RFID tags, which enable precise identification and tracking of each exam packet. Complementing this, a tamper-detection sensor continuously monitors the integrity of the sealed envelopes. If any unauthorized access is attempted, the sensor triggers an immediate alert. The system is also equipped with a user-friendly web interface that allows authorized personnel to monitor real-time access logs and the status of the exam papers. This comprehensive approach not only prevents exam paper leaks but also provides a reliable way to identify authorized individuals, ensuring accountability. By alerting authorities instantly upon detecting tampering, the system enhances security and reinforces trust in the examination process. This innovative solution represents a proactive step forward in safeguarding academic integrity through technology.

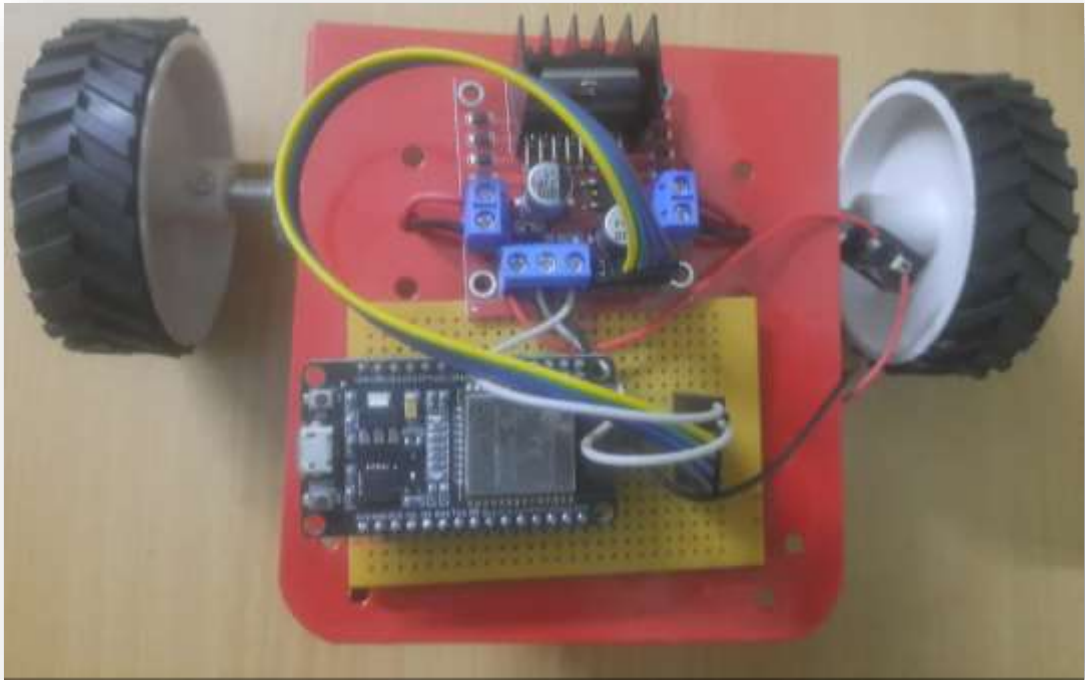


S.Kaveri

22RH1A0252

III EEE

Empowering Independence: The Voice-Controlled Smart Wheelchair



This innovative project introduces a smart, motorized, voice-controlled wheelchair designed to enhance mobility for individuals with physical disabilities. Leveraging embedded systems technology, the wheelchair can be controlled through both voice commands and manual operation, providing users with flexibility and increased independence. The "Voice-Controlled Wheelchair" operates through a straightforward setup where voice commands determine its movement. Users can provide input via a Bluetooth-enabled mobile device, which captures commands through the "BT Voice Control for Arduino" app. These commands are then transmitted to the wheelchair's control unit, which features a Bluetooth SR-04 module connected to an Arduino board. Simple commands like "Go," "Back," "Left," "Right," and "Stop" allow intuitive control of the wheelchair's motion. Prioritizing accessibility, cost-efficiency, and energy conservation, this design is tailored to support users seeking greater autonomy in their daily lives. The project exemplifies how technology can bridge gaps in mobility and improve quality of life.

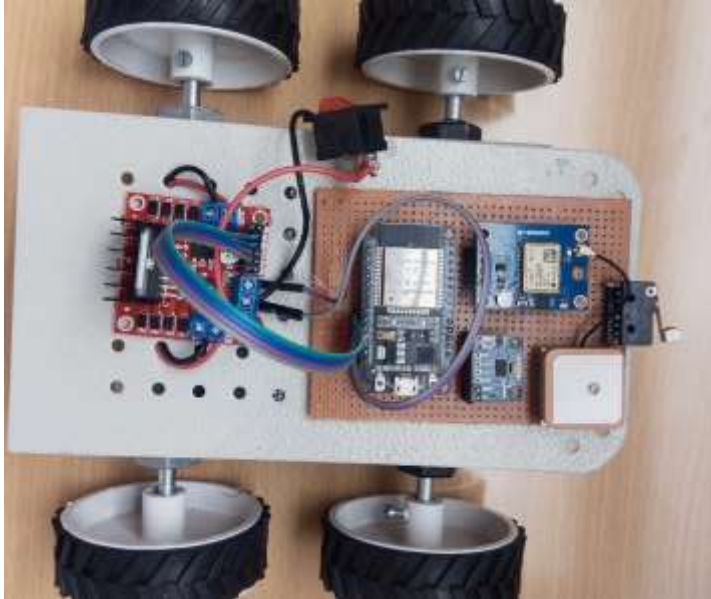


V.SPOORTHI REDDY

22RH1A0261

III EEE

Accident Alert System: Enhancing Emergency Response through Real-Time Notifications



The Accident Alert System is an innovative safety solution engineered to detect vehicular accidents and instantly notify emergency contacts with GPS coordinates. This real-time alert system utilizes the power of the ESP32 microcontroller, an ADXL345 accelerometer, and a GPS module to continuously monitor a vehicle's orientation and detect any crash activity. In the event of an accident, the system automatically sends alerts through the Blynk and Telegram applications, sharing the vehicle's precise location to expedite emergency response. By providing immediate and accurate information, the Accident Alert System is designed to reduce response times, potentially saving lives and enhancing safety on the road.



S. Deepika

22RH1A0257

III EEE

INTERNET OF BEHAVIOR



IoB can't be talked about without the mention of IoT. The Internet of Things (IoT) is an interconnected network of physical devices that gather and share data and information via the Internet. The IoT is continually increasing and changing in terms of its complexity, i.e. the way devices are interconnected, the calculations that these things can perform on their own, and the data that is stored in the cloud are all evolving. The Internet of Behaviour refers to the gathering of data (BI, Big Data, CDPs, etc.) that offers important information on client behaviours, interests, and preferences (IoB). From a behavioural psychology standpoint, the IoB tries to comprehend the data acquired from users' online activities. It aims to answer the question of how to interpret data and how to use that knowledge to develop and promote new goods, all from the perspective of human psychology.

The term "IoB" refers to a method of analyzing user-controlled data from a behavioural psychology standpoint. The findings of that study influence new ways to create a user experience (UX), search experience optimization (SXO), and how to advertise a company's final products and services.

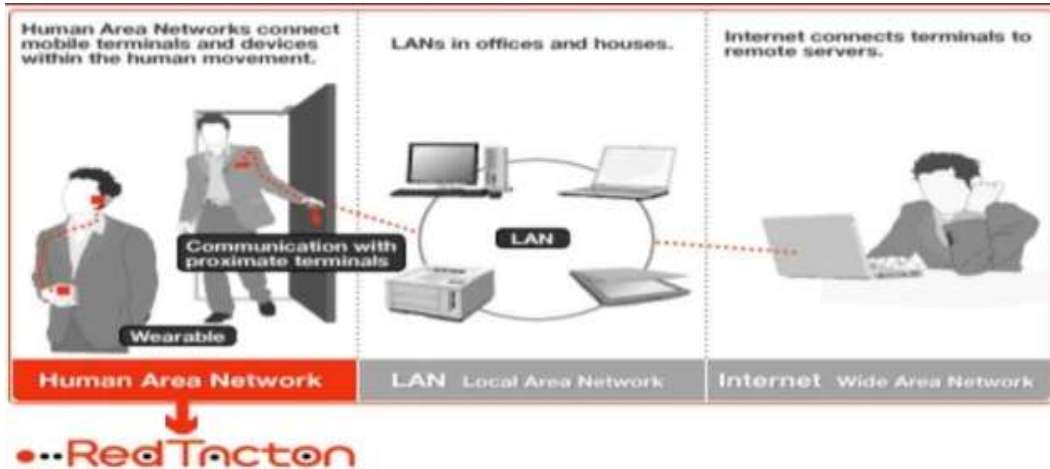
As a result, while doing IoB is technically easy, it is psychologically challenging. For ethical and legal reasons, it is necessary to perform statistical studies that record everyday routines and behaviours without totally revealing customer privacy.

K.Varshini

20RH1A04A5
II ECE B



HUMAN AREA NETWORK



Human Area Network

Human Area Network is a wireless network also referred to as RedTacton that uses the human body as a medium for high-speed transmission. It is different from other wireless and infrared technologies in the sense that it uses tiny electric field emitted on the surface of the human body.

The human body forms a transmission path whenever a part of it comes into contact with the RedTacton transceiver. Body surface can be hands, legs, arm, feet or face. It can work through clothes and shoes. Whenever the physical contact between the transceiver and the human body is lost, communication ends.

RedTacton can be used for intuitive operation of computer-based systems in daily life, temporary one-to-one private networks based on personal handshaking, device personalization, security, and a host of other applications based on new behavior patterns enabled by RedTacton.

Sindhuja. G

18RH1A04K9
IV ECE D



Celebrating Success: Our Placement Achievers

Accenture



A NAVYASRI
21RH1A0204



ISLAVATH ALEKYA
22RH5A0207



ACHE AKSHITHA
22RH5A0201



A DEVIKA MADHAVI
21RH1A0203



MUNJA VANDANA
22RH5A0221



G SHARANYA
22RH5A0206



DANTALA PRIYANKA
22RH5A0205



S TEJASWINI
21RH1A0225



PYATA JAHNAVI
22RH5A0225

Accenture

A NAVYASRI
21RH1A0204

ISLAVATH ALEKYA
22RH5A0207

ACHE AKSHITHA
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A DEVIKA MADHAVI
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MUNJA VANDANA
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DANTALA PRIYANKA
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S TEJASWINI
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PYATA JAHNAVI
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MEMORABLE EVENTS



MRECW MEDHA 2024

The highly anticipated MEDHA-2K24, organized by the IEEE, CSI, and ISTE Student Chapters, took place on **28th September, 2024**. This state-level technical symposium aims to bring together some of the brightest minds in engineering and technology from colleges across the region. **MEDHA** has consistently provided a platform for students to showcase their technical skills, innovate, and compete in a variety of challenging events. **MEDHA-2K24** is more than a symposium—it's a celebration of knowledge, innovation, and collaboration.



Proud Moments: Celebrating Student Success in Competitions



ONE WEEK NATIONAL LEVEL FACULTY
DEVELOPMENT PROGRAMME ON
**Next-Gen Smart Grid Technologies with Power
Electronics Innovations**
15th to 20th July, 2024



ESPERANZA-2021-Interaction Day Celebrations for I & II Year Students.



MRECW Staff Recreation Club presents New Year Celebrations-2022



ALUMNI TALK

Each and every student will get placed in the company because they train us in such a manner that our technical skills and educational skills provided by the college will be extremely great. This college will train us to get good technical skills in every programming language according to required for my branch

M. Asritha

17RH1A04C1

Peaceful Environment, Placements with high packages, Supportive faculty, Events conducted by the college are really helpful, Providing trainings with the updated technology and also they provide us CRT trainings with highly qualified teachers from institutions like FACE,TALENTIO etc.

S. Karishma

17RH1A04J5

"MRECW- my place of learning, loving and living with a lots of happiness"

Positive are many I'm very glad that I came to this college i have to bad affect. after coming here I even changed some of my attitude and even managed my anger it was all because of my HOD and teachers. they helped me allot in all factors.

B. Purna Chandrika

17RH1A0435

IMPORTANT WEBSITES

All About Circuits - allaboutcircuits.com

A comprehensive resource for electronics, covering theory, components, and circuit analysis with tutorials, forums, and news.

Electronics Tutorials - electronics-tutorials.ws

A site dedicated to foundational tutorials in electronics, from basic concepts to advanced topics.

MIT OpenCourseWare - ocw.mit.edu

Offers free online courses from MIT, including a wide range of electrical engineering and computer science subjects.

Electronics Hub - electronicshub.org

Provides project ideas, circuit diagrams, tutorials, and how-to guides for electronics enthusiasts and students.

CircuitLab - circuitlab.com

An online circuit simulator where students can design, analyze, and test circuits.

IEEE Xplore Digital Library - ieeexplore.ieee.org

A leading research database providing access to IEEE journals, conferences, and standards in engineering.

Electronics Stack Exchange - electronics.stackexchange.com

A Q&A platform for electronics and electrical engineering, where students can ask questions and find answers.

Hackaday - hackaday.com

A blog featuring electronics projects, DIY hacks, and articles on innovative technology.

EdX - edx.org

Offers free online courses from universities worldwide, with courses on electrical engineering, circuits, and digital electronics.

NI (National Instruments) Learning Center - ni.com/academic

Provides resources, tutorials, and labs for learning about LabVIEW, data acquisition, and instrumentation.

Arduino - arduino.cc

The official site for Arduino projects, tutorials, and community discussions, ideal for students interested in microcontrollers.

Coursera - coursera.org

Offers online courses from top universities on electronics, electrical engineering, and related fields.

Electronics Hub - electronicshub.org

A blog that provides articles, projects, and tutorials on various electronics and electrical engineering topics.

The Engineering Toolbox - engineeringtoolbox.com

Contains various tools and calculators for engineers, covering a wide range of electrical calculations and reference materials.

Instructables - Electronics - instructables.com

A community-driven platform where students can find and share DIY electronics and engineering projects.

EEVblog - eevblog.com

A video blog that features electronics engineering tutorials, teardown videos, and equipment reviews.

Electrical4U - electrical4u.com

Covers electrical and electronics engineering concepts in a simple way, including detailed guides and exam preparation tips.

Make: Electronics - makezine.com

A resource for DIY projects, offering a blend of electronics and engineering tips with a focus on creativity and innovation.

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