



## Department of Electronics and Communication Engineering

### Technical Magazine

Issue 3 [May, 2024]

#### 1. Message from the Head of Department

Established in 2009, the Department of Electronics and Communication Engineering (ECE) at Akshaya College of Engineering and Technology boasts an intake of 60 students and is affiliated with Anna University. By providing high-quality education and maintaining excellent academic standards, the department received NBA accreditation in 2024. Offering a postgraduate programme (M.E. VLSI Design) with an intake of 9 students, the department has also been recognized as a research centre for conducting Ph.D. programmes under Anna University. With a commitment to providing professional training in emerging areas, the department aims to mould young professionals and enhance their skills and knowledge in line with current developments. Equipped with high-tech facilities, the department offers a conducive environment for students to excel in their academic pursuits and engage in research activities. Its affiliation with Anna University further enriches the academic experience, ensuring that students receive comprehensive education and training in Electronics and Communication Engineering.



Mrs. K.Nimisha, Assistant Professor (Senior Grade)  
(HoD - i/c)

## **2. Vision and Mission of the department**

### **Vision**

Emerge as eminent Centre of learning in Electronics and Communication Engineering to produce engineers, capable of meeting the global challenges through design, development and research, for the welfare of the society and humanity.

### **Mission**

- DM 1 : Adopt a systematic and technology enabled teaching-learning process with an ability to contribute for research.
- DM 2 : Develop electronics and communication engineers with managerial skills and life-long learning practices, for sustainable economic growth, beneficial to the society.
- DM 3 : Establish Centre of excellence in VLSI technologies and Embedded systems and provide a creative environment with industry linked initiatives for encouraging innovation.

### **3. Program Educational Objectives – PEOs**

PEO 1 : The graduates will have successful careers in industries or pursue higher studies and research or emerge as entrepreneurs.

PEO 2 : The graduates will be able to apply fundamental and advanced knowledge, skills and techniques in devising innovative products for the benefits of society.

PEO 3 : The graduates will be able to critically analyze existing literature in an area of specialization and research oriented methodologies to solve the problems identified.

## **4. Program Specific Outcomes – PSOs**

PSO 1: Professional skills: Students shall have skills and knowledge to work on analog and digital systems, adhoc and sensor networks, VLSI, embedded and communication systems

PSO 2: Competency: Students shall qualify at the State, National and International level competitive examination for employment, higher studies and research.

## 5. Program Outcomes –Pos

- PO 1 : Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2 : Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3 : Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
- PO 4 : Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5 : Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO 6 : The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7 : Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8 : Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO 9 : Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- PO 10 : Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11 : Project management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## 6. Message From Editorial Team

Dear Students, We hearty welcome you to the newly launched ECE Department's third issue of the Magazine for the academic year 2023-2024.

The objective of the magazine is to mainly focus on Achievement of the students from the ECE department in the Co-curricular and Extra-Curricular Activities.

We are also thankful to our Management and Principal for their support and encouragement. Finally we are gratified to our reviewers for their frank opinions and constructive suggestions, namely our colleagues and students.

- **Chief Editor:** [Mrs.K.Nimisha,AP(Sr.G)]  
**Faculty Advisors:** [Mrs.A.Ambika,AP(S.G),  
Ms.S.Vishnushree,AP/ECE, Mrs.A.RamjanBegam,AP/ECE]
- **Student Editors:** [S.B.DharaniDharan]
- **Design Team:** [Mrs.A.RamjanBegam,AP/ECE]

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## **POWER EFFICIENT AND MINIMAL TRANSISTOR FULLADDER USING HYBRID LOGIC STYLE**

Most of the full adder (FA) circuits are implemented through a hybrid logic style using three different modules. The principal peculiarity of these hybrid logic style-based FA cells is that cache module could be optimized individually to improve the circuit performance. A high-performance 1-bit hybrid FA cell is proposed with pass transistor logic and transmission gate logic in the present work. The proposed FA circuit is implemented using 20- transistors to achieve optimum performance. The proposed circuit is simulated in Microwind 3.1 tool by using 90-nm CMOS technology. Comparison of the design matrices for the proposed 1- bit hybrid FA cell against the five different reported FA circuits is also carried out. The present study reported 13.01-54.93% and 13.01-59.20% improvement in terms of delay and power delay product (PDP) respectively, compared to other FA designs. The FA circuit is tested at different technologies (90nm, 65nm and 45nm) to check the robustness.

**-M. DHARANI**

**II ME**

## **STRAIT: SELF TEST AND IMPROVED SELF REPAIR FOR AI ACCELERATOR THROUGH RECURSIVE APPROACH**

As the demand for data-intensive analytics has increased with the rapid advance in artificial intelligence (AI), various AI accelerators have been proposed. However, as AI based solutions have been adapted to applications requiring accuracy and reliability, the reliability of them has become a critical issue. For this reason, self-test and self-recovery for AI accelerator is proposed. The proposed self-test is progressed using scan chains composed of functional paths and can achieve a 100% test coverage (for both stuck-at and

transition-delay faults) with a small number of test patterns and reduced test power. The self-test using hybrid BIST includes memory-BIST for testing accumulators, registers and buffers along with logical BIST for verifying processing unit functionality. Further, self-diagnosis and self-recovery is performed by utilizing the structural and operational characteristics of systolic array in AI accelerator. The proposed self-diagnosis is progressed with the proposed self-test in real time and allows accurate fault localization with fault type analysis. The proposed self-recovery is progressed using efficient pruning for faulty processing elements with four level of processing. The proposed recovery method can be efficiently used for both sparse and dense networks. The reliability of AI accelerators can drastically increase with negligible performance degradation. The proposed AI testing and recovery provides an integrated solution with a small area overhead.

**- S.HARSHINI**  
**II ME**

**AUTOMATIC HOUSE-HOLD WASTE**  
**DECOMPOSER**  
**USING BLACK SOLDIER FLY**

There are two major problems that we are facing currently. Firstly, a growing human population continues to contribute to the increased food demand. Secondly, the volume of organic waste produced will threaten human health and the quality of the environment. Recently, there is an increasing number of efforts placed into farming insect biomass to produce alternative feed ingredients. Black soldier fly larvae (BSFL), *Hermetia illucens* have proven to convert organic waste into high- quality nutrients for pet foods, fish and poultry feeds, as well as residue fertilizer for soil amendment.

However, better BSFL feed formulation and feeding approaches are necessary for yielding a higher nutrient content of the insect body, and if performed efficiently, whilst converting waste into higher value biomass. Lastly, this paper reveals that BSFL, in fact, thrives in various ranges of organic matter composition and with simple rearing systems.

Furthermore, using BSFL offers a sustainable and financially feasible solution in addition to addressing the two problems of waste management and food production. We can greatly lessen the environmental impact of disposing of organic waste by incorporating BSFL farming into the present waste management systems.

**-AFSAL T A  
KALAISELVI M  
ABISHEK V  
ASARUDEEN T  
IV BE ECE**

### **AI CHATBOT ASSISTED APP FOR EFFECTIVE SUGGESTION OF CROPS AND YIELD PREDICTION**

This paper presents a modern agriculture, optimizing crop selection based on soil characteristics is essential for maximizing yields and sustainability. This project proposes a novel approach to crop commendation using soil analysis and an organic chatbot interface implemented in Python with a web interface. The system integrates soil analysis data including pH levels nutrient composition, and soil type, to predict the most suitable crops for a given area. Machine learning algorithms, such as decision trees or support vector machines are utilized to develop predictive models based on historical crop yield data and soil parameters. The organic chatbot interface provides a user-friendly platform for farmers and

agricultural experts to interact with the system. Through natural language processing (NLP) capabilities, users can input soil analysis results and receive personalized crop recommendations in real-time. The chatbot interface also allows for interactive exploration of crop recommendations, providing additional insights and explanations behind the suggestions. Furthermore, the system incorporates feedback mechanisms to continuously improve crop recommendation accuracy over time. By analyzing user interactions and feedback, the model can adapt and refine its recommendations, enhancing its effectiveness and reliability. The Python web interface facilitates seamless integration of the crop recommendation system into existing agricultural work flows. Farmers and stakeholders can access the platform from any device with internet connectivity, enabling convenient decision-making and planning processes.

**-HARSHITHA S  
MEENALOCHANI M  
SAMPATH K  
VISHNU ASHOK A  
IV BE ECE**

### **IOT BASED SMART AGRICULTURE MONITORING SYSTEM**

This paper proposes and demonstrates an economical and easy to use Arduino based controlled irrigation system. The designed system deals with various environmental factors such as moisture, temperature and amount of water required by the crops using sensors like temperature sensor and soil moisture sensor. Data are collected and received by Arduino micro controller.

This allows user to control irrigation pumps to meet the standard values which would help the farmer to yield maximum and quality crops. Smart irrigation is one such technology which have attracted

interest of many researchers and is evolving and improving from about a decade.

This smart irrigation industry where water waste is minimized and is no longer sustainable socially, economically and conventionally as well. The idea and development of smart irrigation is basically focused onto reduce human efforts as well as reduce resources (water) and power consumption (electricity). Insatiable appetite for convenience and comfort and also to overcome natural barriers, there is a constant pull on technology to develop more and more.

On the other hand growing demands for food due to population expansion put farmers to face many issues regarding the quantity and quality of crops which in fact made another challenge on researchers to develop and approach a fine smart irrigation system that would provide farmer a smart tool which support them in yielding quality crops.

**- GEORGE NICHOLAS A  
ARJUN M  
GOWTHAM A  
PRAVEEN KUMAR S  
IV BE ECE**

**ROBOTIC ARM WITH VOICE ASSISTANT**  
**USING IoT**

This project Prototype, "Robotic Arm with Voice Assistant Using IoT" explores the integration of robotic automation with advanced voice-recognition technology and the Internet of Things (IoT). This initiative aims to create a user-friendly robotic arm capable of performing tasks with voice commands, all while being remotely

monitored and controlled via IoT connectivity. The robotic arm is designed with multiple degrees of freedom, allowing for complex manipulations, and is equipped with various sensors to ensure precision and safety during operation. By incorporating a voice assistant, the project provides an intuitive interface for controlling the robotic arm, reducing the need for specialized training or manual input.

The IoT component adds a layer of remote accessibility, enabling users to interact with the robotic arm through a web-based or mobile application. This connectivity allows for real-time monitoring, remote command execution, and data collection, enabling predictive maintenance and operational analytics. The project also considers security, ensuring that communications are encrypted and user access is controlled to prevent unauthorized usage. Testing and validation are conducted to assess the robotic arm's accuracy, reliability, and responsiveness to voice commands, as well as its ability to maintain stable IoT connections.

Ultimately, this project serves as a proof-of-concept for combining voice-controlled robotics with IoT infrastructure, offering a flexible platform for various applications from industrial automation to assistive technologies. The expected outcomes include a fully functional prototype and valuable insights into the future development of integrated robotic systems that leverage voice technology and IoT for enhanced functionality and accessibility.

**MOUNI SHREE H  
MADHUMITHRA M  
JENAT PRAICY K  
MOHAMMED ASLAM A  
IV BE ECE**

## **ML Assisted Image Processing On Medicinal Plants And It's Supply Chain**

The integration of Machine Learning (ML) into image processing software holds immense potential for revolutionizing the management of medicinal plants and their supply chains. This abstract outline a conceptual framework for a software system aimed at enhancing the efficiency, accuracy, and traceability of processes from plant cultivation to market distribution. Through the utilization of advanced ML algorithms, the proposed software seeks to automate the identification and classification of medicinal plants via detailed image analysis, essential for ensuring product efficacy and safety. Given the laborious nature of plant identification particularly in the medicinal domain, a vision-based approach offers a promising solution.

This research advocates for a vision-based method leveraging Machine Learning (ML) models to recognize herb plants. The Mobile Net v2 architecture is employed, utilizing vital libraries such as TensorFlow for additional layers in the architecture, Keras for image processing, and Matplotlib for plotting images during model evaluation and analysis. The dataset, consisting of an average of 85 leaves per plant, undergoes resizing and augmentation to enhance sample size.

The dataset, consisting of an average of 93 leaves per plant, undergoes resizing and augmentation to enhance sample size. Following training, validation, and testing phases. the ML model demonstrates impressive accuracy, achieving a recognition rate of 98.3%. Subsequently, the ML model is deployed to the cloud, and a software application, developed using Tkinter, facilitates real-time leaf identification. This software serves as a vital tool for testing and classifying medicinal plant leaves through the trained ML model.

The automated recognition offered by this software represents a significant advancement in bridging taxonomic gaps and has garnered significant interest from botany and machine vision fields.



Following training, validation, and testing phases, the ML model demonstrates impressive accuracy, achieving a recognition rate of 97.6%. Subsequently, the ML model is deployed to the cloud, and a software application, developed using Tkinter, facilitates real-time leaf identification.

This software serves as a vital tool for testing and classifying medicinal plant leaves through the trained ML model. The automated recognition offered by this software represents a significant advancement in bridging taxonomic gaps and has garnered significant interest from botany and machine vision fields.

**HARSHA VARDHAN D**

**VASUDEVANS V**

**SANTHOSH J**

**MADHAN KUMAR S**

**IV BE ECE**

**BOVINEWELL: INTEGRATED COW HEALTH MONITORING &  
LIVESTOCKMARKETPLACE  
LENGE**

The project " BOVINEWELL: INTEGRATED COW HEALTH MONITORING& LIVESTOCK MARKETPLACE" explores Farm automation and advanced technology are boosting agricultural production, with cattle health being a key focus. Wireless mobile sensor networks offer a new level of surveillance for businesses, allowing for continuous checks on animal health and easy diagnosis. This technology uses sensor technology to identify abnormal behavior, such as temperature and heart rate, and creates caution alarms when abnormal conditions are detected. The wireless sensor network technology can accumulate ecological information, such as temperature and stickiness, and provide real- time insights to support Live Stock Professionals. Good health and wellbeing of animals are essential to dairy cow farms and sustainable production of milk. Unfortunately, day-to-

day monitoring of animals condition is difficult, especially in large farms where employees do not have enough time to observe animals and detect first symptoms of diseases. This project presents to monitor a system addresses these challenges and provides real time insights to support LIVE STOCK Professionals In delivering high-quality Veterinary services and a digital platform that connects buyers and sellers, facilitates transparent transaction, and offers market intelligence for informed decision making .All the data will be available in our THIMIL APP.

**VIDHYA BHARATHI J**  
**AMIRTHA YOHALAKSHMI A**  
**DEEPIKA A**  
**VIGNESH L**  
**IV BE ECE**

### **DESIGN OF LOW COST COLD STORAGE UNIT FOR** **HORTICULTURE PRODUCTS**

This paper, suggest utilizing Internet of Things (IoT) to create a "low-cost cold storage unit for horticulture produce" prototype that will transform supply chain operations. Through the integration of real-world sensors with the internet, our prototype functions as a central point to optimize productivity and simplify procedures throughout the whole supply chain. The cold storage facility's temperature, inventory levels, and product identification are all tracked by the system using Internet of Things (IoT)-based sensors. Businesses are able to act quickly by using Python programming and the Raspberry Pi-3 B+ to analyze data obtained from these sensors in real-time and make informed decisions. Our prototype guarantees more efficiency, lower costs, and higher customer satisfaction by automating inventory management, providing predictive maintenance insights, and optimizing resource

utilization. All things considered, the use of our smart cold storage prototype marks a substantial improvement in supply chain operations and provides a solution to improve competitiveness in the fast-paced market of today.

To further strengthen its usefulness in optimizing supply chain operations, our prototype integrates machine learning algorithms to forecast demand patterns and improve decision-making processes. Our technology not only solves the shortcomings of conventional cold storage techniques but also provides a flexible and scalable foundation for future advancements in agricultural logistics by utilizing the power of IoT and advanced analytics. In this article, we provide a detailed roadmap for the design and construction of IoT-enabled cold storage facilities, which have the potential to completely transform the way the horticultural sector handles perishable products.

**- MANJU J  
HARINATH M  
PRIYADHARSHINI A  
SRIKRISHNAN P  
IV BE ECE**

### **ORGANIC FARMING MANAGEMENT SOFTWARE**

This Project presents a modern agriculture, optimizing crop selection based on soil characteristics is essential for maximizing yields and sustainability. This project proposes a novel approach to crop recommendation using soil analysis and a Web project to help farmers ensure greater profitability through direct farmer to supplier and farmer to farmer communication. This service boosts business communication and brings transparency in the System. This innovative site allows for good farmer, retailer and supplier communication. It allows farmers to login and communicate to respective dealers. When dealers publish an advertisement or offer, the respective farmers get notified in their login. The farmers may

also submit their grievances and complaints to respective dealers or authorities using their farmer login on a separate complaints page and authorities will get access to that page regularly using their login id and passwords. The system integrates soil analysis data, including soil health, nutrient composition, and soil type, to give the most suitable crops for a given area. The Organic Farming Management System (OFMS) interface provides a user friendly platform for farmers and agricultural experts to interact with the system. Through natural language processing (NLP) capabilities, users can input soil analysis results and receive personalized crop recommendations in real-time. The OFMS interface also allows for interactive exploration of crop recommendations, providing additional insights and explanations behind the suggestions. Furthermore, the system incorporates feedback mechanisms to continuously improve crop recommendation accuracy over time. By analyzing user interactions and feedback, the model can adapt and refine its recommendations, enhancing its effectiveness and reliability. The web interface facilitates seamless integration of the crop recommendation system into existing agricultural workflows. Farmers and stakeholders can access the platform from any device with internet connectivity, enabling convenient decision-making and planning processes.

**- ANANDHA KUMARAN M  
AYYANAR DHANUSH K  
CEBIN RAJA CS  
DHEEPAN SATHYA P  
IV BE ECE**

### **E-WASTE MANAGEMENT SYSTEMS**

In the face of escalating e-waste volumes globally, effective management strategies are imperative to mitigate environmental and health hazards. This paper presents the design and implementation of an E-Waste Management System (EMS) integrated with an innovative component reusability analysis

feature. Built on Django, a Python web framework. The EMS empowers users to register, log in, and effortlessly submit details regarding e-waste items slated for disposal. A distinctive aspect of the EMS lies in its advanced functionality to analyze e-waste components for potential reuse thereby enhancing sustainability and economic viability. Upon submission, the system rigorously scrutinizes each item, identifying reusable components with a potential resale value.

Additionally, the EMS offers insights into the possible applications of these components in future endeavors. Users accessing the EMS are provided with comprehensive reports delineating the list of salvageable components within their e-waste items and their estimated resale value. Furthermore, the system outlines potential avenues for repurposing these components, ensuring maximum utilization and environmental conservation.

Key features of the EMS include user authentication e-waste item submission, component reusability analysis, and detailed reporting. Leveraging Django's robust framework, the system ensures scalability, security, and seamless user experience. In conclusion, the integration of component reusability analysis within the E-Waste Management System represents a significant advancement in sustainable waste management practices. By empowering users with insights into the salvageable components within their e-waste items and their potential resale value the EMS fosters a culture of environmental stewardship and resource optimization.

**- KARTHIKAPRIYA M  
YOGARAJ M  
PRABU M  
JEYA BHARATH M  
IV BE ECE**

## **PARK PLAZA**

The Park Plaza website project aims to create a comprehensive, user-friendly online platform that enhances the customer experience and streamlines hotel management processes. The website will feature an intuitive interface, making it easy for users to navigate and find information about hotel amenities, services, and local attractions. A robust booking system will allow guests to check availability, make reservations, and manage their bookings seamlessly. Personalized services, such as user accounts and loyalty programs, will cater to frequent guests, offering them special offers and tailored experiences. The site will be fully responsive, ensuring optimal functionality across desktops, tablets, and smartphones. Utilizing a content management system, hotel staff will easily update content, manage reservations, and monitor site analytics. Key features include a visually appealing homepage, a secure booking engine, a multimedia gallery, a local attractions guide, and customer support through live chat and FAQs. By implementing cutting-edge frontend and backend technologies, along with stringent security measures, the Park Plaza website will significantly improve the hotel's online presence, delivering a seamless and engaging experience for guests while enhancing operational efficiency.

**-P. MENAGA**

**M. MANOGNA**

**K. SHANMUGHALAKSHMI**

**T. SWETHA**

**II BE ECE**

## **TEMPERATURE BASED FAN SPEED CONTROLLER**

This project aims to create a temperature-based fan speed controller using Arduino microcontroller. The system monitors the

ambient temperature using a temperature sensor and adjusts the speed of the fan accordingly. The controller utilizes a proportional-integral-derivative (PID) algorithm to maintain a set temperature by varying the PWM (Pulse Width Modulation) signal to the fan. Through this method, energy efficiency is improved by reducing fan speed when the temperature is within a comfortable range, thereby saving power and extending the fan's lifespan. The project offers a cost-effective and practical solution for temperature regulation in various environments. The system utilizes a temperature sensor to monitor ambient temperature and adjusts the speed of a fan accordingly. The Arduino microcontroller reads the temperature sensor data and computes the appropriate fan speed using a control algorithm. By varying the duty cycle of the fan's PWM signal, the speed of the fan motor is regulated

**-V.ANGAMUTHU**

**P.RAHUL PRASATH**

**V.SANJAI**

**S.SUHASH**

**II BE ECE**

### **SECURITY ALARM USING MOTION SENSOR**

The security alarm system outlined in this project employs cutting-edge motion sensor technology to ensure comprehensive protection for both residential and commercial properties. By utilizing advanced motion sensors strategically placed throughout the premises, the system can swiftly detect any unauthorized movement and promptly activate an alarm. This immediate response not only serves to deter potential intruders but also provides a heightened sense of security for property owners and occupants. One of the key advantages of this system is its seamless integration with modern technology. Through a smartphone application, users can remotely access the system, monitor their

property in real-time, and receive instant notifications of any detected motion or security breaches. This feature not only enhances convenience but also allows for quick action in case of emergencies, empowering users with greater control over their security. Moreover, the system is designed with flexibility and scalability in mind, catering to a wide range of property sizes and layouts. Whether installed in a small apartment or a large commercial complex, the motion sensors can be customized and configured to meet specific security needs. This adaptability ensures that every corner of the property is effectively covered, minimizing blind spots and vulnerabilities. In terms of implementation, the installation process is straightforward and minimally invasive, ensuring minimal disruption to daily activities. Professional technicians can efficiently set up the system, conduct thorough testing, and provide comprehensive training to property owners and designated personnel. This proactive approach not only streamlines the deployment process but also ensures that users are fully equipped to maximize the system's functionality and effectiveness.

Furthermore, the system offers additional features such as integration with existing security infrastructure, compatibility with other smart home devices, and the option for centralized monitoring services. These enhancements contribute to a robust and holistic security solution that not only protects against intrusions but also enhances overall property management and safety.

Overall, this presentation will delve into the features, benefits, and practical applications of this innovative security alarm system. By highlighting its capabilities in enhancing security, deterring threats, and providing peace of mind to users, the project aims to showcase the value and effectiveness of integrating motion sensor technology into modern security solutions.

**-LOKESHWAR.S**  
**MANOJ.M**  
**KATHIRVEL.S**



**HARIVATHSAN.G**  
**II BE ECE**

**SMART BLIND STICK**

A smart stick concept is devised to provide a smart electronic aid for blind people. Blind and visually impaired find difficulties in detecting obstacles during walking in the street. The system is intended to provide artificial vision and object detection, real time assistance via making use of Arduino UNO.

The main objective of our project is to provide a sound based assistance to blind people. The existing devices for the visually impaired only focus on travelling from one location to another. The device is aimed to help visually impaired with the same man ever as that of sighted people. A brief study had been carried out to understand various issues related to the project which involves providing a smart electronic aid for blind people to provide artificial vision and object detection, using Arduino Uno. Our project mainly focuses on the visually impaired people who cannot walk independently in environment.

The system consists of ultrasonic sensors, and the feedback is receive through audio. The aim of the overall system is to provide a low cost and efficient navigation and obstacle detection aid for blind which gives which gives a sense of artificial by providing information about the environmental scenario of static and dynamic object round them, so that they can walk independently.

**K.SRI HARINI**  
**M.L.JAYASHREE**  
**T.ARCHANA**  
**K.SAKTHI**  
**II BE ECE**

## **SMART VEHICLE TRACKING SYSTEM**

A Smart Vehicle Tracking System utilizes cutting-edge technology to monitor and manage vehicles in real-time, revolutionizing fleet management and personal vehicle oversight. The system integrates GPS, GSM, and IoT sensors to provide precise location data and operational status updates, ensuring efficient routing, reduced fuel consumption, and enhanced safety. By incorporating artificial intelligence (AI) and machine learning, the system can predict maintenance needs, detect unauthorized vehicle usage, and generate comprehensive analytics for informed decision-making.

The Smart Vehicle Tracking System is designed to cater to diverse applications, including logistics, transportation, and personal vehicle management. For fleet managers, it offers improved resource allocation, route optimization, and compliance with regulatory requirements. For individual users, it provides peace of mind through real-time tracking and security features. The system's user-friendly interface and customizable alerts ensure timely notifications about vehicle status and potential issues.

Incorporating robust data encryption and secure communication protocols, the Smart Vehicle Tracking System ensures data integrity and privacy. This innovative solution not only enhances operational efficiency but also contributes to sustainable practices by minimizing fuel wastage and reducing carbon footprints. Ultimately, the Smart Vehicle Tracking System represents a significant advancement towards smarter, safer, and more efficient vehicle operations.

**-MITHUM.M  
MOHAMMED HARRIS.I  
SANTHOSHKUMAR.P  
SANJAY.V  
VAIRAMUTHU.K.S**

**IOT-BASED WATER QUALITY SENSOR**

Arduino is an open-source platform that enables us to quickly build electronics projects. It consists of both a physical Programmable Circuit Board (PCB) and a piece of software (an Integrated Development Environment (IDE)) that works on all known operating systems. The system, when tested was able to test the quality of the water.

This project presents a design of water quality checking. It stores data collected at some predetermined sampling interval, with date and time stamps for later retrieval with real-time notifications for supervision and analysis of different types of water. It consists of an Arduino UNO (micro-processor) which acts as a gateway to collect data and information through different probes. The idea behind it is mainly to check the quality of the water and is this water drinkable or not.

**-MADHAN.S  
SANJEEV.B  
SAM DAISHUAN.J  
SANJAY.R  
II BE ECE**

**WEATHER MONITORING SYSTEMSEM**

Arduino is an open-source platform that enables us to quickly build electronics projects. It consists of both a physical Programmable Circuit Board (PCB) and a piece of software (an Integrated Development Environment (IDE)) that works on all known operating systems. We use the Arduino to develop a weather monitoring system based on temperature and humidity variables obtained from a DHT11 sensor. The system, when tested, was able to report if weather is Hot, Normal, or Cold based on the exact temperature and relative humidity within a 20meter area. We also demonstrate the recycling of plastic foam to be used as an insulator

and casing for electronic components. Plastic foam, which is a waste material, greatly contributes to the Global Warming Potentials (GWP) when discarded improperly.

This project presents a design of weather monitoring system. It stores data collected at some predetermined sampling interval, with date and time stamps for later retrieval with real-time notifications for supervision and analysis of different environmental parameters like temperature, humidity, atmospheric pressure, wind speed, wind direction, air quality, and light intensity, amount of rainfall and coordinates of the location. It consists of an Arduino UNO (micro-processor) which acts as a gateway to collect data and information through different probes. Such type of system can be used in controlled environment like agriculture farms and aqua culture. The idea behind it is mainly weather monitoring and forecasting at micro-ecological level, monitoring upcoming situations to sound alerts during unfavorable circumstances.

**-R.VISHNUKUMAR  
B.MADHANKUMAR  
M.AATHISHKUMAR  
M.NITHISH  
II BE ECE**

### **SMART DUSTBIN**

The main objective of the project is to design a smart dustbin which will help in keeping our environment clean and also ecofriendly. We are inspired from Swaach Bharat Mission. Nowadays technologies are getting smarter day-by-day so, as to clean the environment we are designing a smart dustbin by using Arduino. This smart dustbin management system is built on the microcontroller based system having ultrasonic sensors on the dustbin. If dustbin is not maintained than these can cause an unhealthy environment and can cause pollute that affect our health.

In this proposed technology we have designed a smart dustbin using Arduino, along with ultrasonic sensor, servo motor, and battery jumper wire. After all hardware and software connection, now Smart Dustbin program will be run. Dustbin lid will open when someone comes near at some range than wait for user to put garbage

Keywords: Dust bin, Arduino UNO, Servo Motors, Ultrasonic Sensors, Connecting wires

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II BE ECE**

### **AIR QUALITY MONITORING SYSTEM**

An air quality monitoring system is a network of sensors and devices designed to measure various pollutants and environmental factors in the air. These systems are crucial for assessing the quality of the air we breathe and for identifying potential health hazards or environmental risks.

The system consists of a network of sensors continuously collect data on pollutant levels and environmental conditions. We use the Arduino to develop a air quality monitoring system based on temperature and humidity variables obtained from a DHT11 andMQ135 sensors. The report obtained by this system is the quality of air, weather (Hot, Normal, or Cold) based on the exact temperature and relative humidity with maximum coverage area of 20meter. This data is then transmitted to a central database or server for processing and analysis. Some systems may also include weather sensors to monitor factors like temperature, humidity, and wind speed, which can influence air quality. Once the data is

collected, it undergoes processing and analysis to generate insights into air quality.

Air quality monitoring systems often integrate with other environmental monitoring networks, such as weather stations or traffic management systems, to enhance their effectiveness. Overall, air quality monitoring systems play a critical role in safeguarding public health, supporting environmental conservation efforts, and promoting sustainable development by providing valuable insights into air pollution and its impacts.

Keywords: Dust bin, Arduino UNO, Servo Motors, Ultrasonic Sensors, Connecting wires

**-M.THULASIDHARAN**  
**II BE ECE**

### **SMART IRRIGATION SYSTEM**

IoT Technology is a network of physical objects that are connected with sensors, software, etc.

This project is based on the agriculture field that automates the irrigation process and on the agriculture field that automates the irrigation process and solves the challenge of water consumption in those areas.

We have developed the system using different sensors like

- (1) Soil Moisture sensor, which measures the moisture present in the soil,
- (2) Water pump Module,
- (3) Relay Module,
- (4) Connecting Wires and Temperature Sensor (DHT11), which traces the temperature change.

All these sensors are connected to the Node MCU ESP8266 microcontroller, which is also a Wi-Fi module.

It uploads the data to the cloud and displays it in the form of readings detected by the Thing speak. This sensor's reading values control the pump for emergency purposes, such as stopping the pump for irrigation.

Thus, this project can automate the irrigation process by analyzing soil moisture and climatic conditions, covering essential aspects like less labor, power consumption, reliability, and cost.

**-Sridharan G  
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II BE ECE**

**HOME AUTOMATION  
USING  
GOOGLE ASSISTANT**

The modern home automation system gives security and blissful life at residence. That is why the popularity of using home automation technology is increasing day by day. Our paper proposed the design and implementation of home automation, Monitoring and home security through the internet of things (IoT).Our system can control and monitor the working process of switches. Our can be controlled via many ways like the internet, smartphone, voice control and electric switch. Through IOT technology, the user can minimize the wastage of electrical power by proper monitoring and controlling. Using ESP8266 microcontroller and google assistant, one can remotely control four relays with the internet. In this ESP8266 project, two household appliances can be controlled from smartphones as well as manual

Switches. If there is no internet, the relay module can be controlled by manual switches. If Wi-Fi is available, the ESP8266 will connect to it automatically. The internet of things allows us to control our home automation system from anywhere in the globe. It lowers the use of superfluous or excessive human effort and raises the level of living in our society. Home automation with IOT is a low-cost and dependable automation technology which can minimize the energy usage while also providing convenience to the users.

**-AZHAGUMUTHU R  
DENSINGH DEVAIRAKKAM G  
MARIAHMMAL S  
PRAGATHI M  
III BE ECE**

### **PREDICTIVE MODEL FOR ACL INJURY**

Anterior Cruciate Ligament (ACL) injuries are common among sports persons; They have significant consequences, including prolonged recovery periods and potential career-threatening outcomes. This abstract presents a predictive model aimed at identifying potential ACL injury risks in sportspersons. Leveraging machine learning algorithms and a comprehensive dataset of biomechanical, physiological, and training-related variables, our model accurately assesses the likelihood of ACL injury occurrence.

Our predictive model integrates biomechanical, physiological, and training-related data to accurately identify athletes at higher risk of ACL injury. Leveraging machine learning algorithms, including decision trees, random forests, and gradient boosting, we analyze a diverse dataset encompassing joint kinematics, muscle strength, landing mechanics, and training workload. Through rigorous



feature selection and model validation processes, we identify key predictors and evaluate model performance across various athlete populations and sporting disciplines.

The developed model offers a user-friendly interface for coaches, trainers, and medical professionals to input athlete data and receive personalized ACL injury risk scores. This facilitates proactive decision-making regarding training modifications, injury prevention strategies, and rehabilitation interventions. By leveraging data-driven insights, our predictive model contributes to the advancement of sports medicine, enhancing athlete welfare and performance outcomes.

In conclusion, our predictive model serves as a valuable tool for identifying ACL injury risk in sportspersons, empowering stakeholders to mitigate injury incidence and optimize athlete health and longevity.

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**KRITHIKA .S**

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**III BE ECE**

### **DROWSINESS DETECTION FOR DRIVER**

Nowadays accidents occurs during drowsy road trips and increase day by day it is known fact that many accidents occurs due to driver fatigue and sometimes inattention. This work is primarily devoted to maximizing efforts to identify drowsiness and ensure road safety. A warning system employing an eye blink sensor for detecting driver drowsiness operates by continuously monitoring the driver's eye blink patterns and alerting them when signs of drowsiness are detected. The system typically consists of an eye blink sensor, such as infrared (IR) light sensors or cameras, positioned strategically within the vehicle to track the driver's eye

movements. The sensor continuously measures the frequency and duration of eye blinks. When the driver starts to become drowsy, their blink rate tends to decrease, and the duration of each blink may become longer. The eye blink sensor detects these changes and sends the data to a processing unit.

The processing unit analyses the incoming data using predefined algorithms to identify patterns indicative of drowsiness. These patterns may include prolonged periods without blinking or irregular blink intervals. Once the system detects signs of drowsiness, it triggers an alert mechanism integrated into the vehicle. The alert mechanism that is auditory alerts serves to notify the driver of their drowsy state, prompting them to take immediate corrective action, such as pulling over to rest or engaging in other strategies to stay alert.

Overall, the warning system using an eye blink sensor acts as a proactive safety measure, helping to prevent accidents caused by driver drowsiness by providing timely alerts and promoting driver awareness and attentiveness during long or monotonous journeys.

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**Sanjay .V**

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**III BE ECE**