



E-MAGAZINE

Revolution Advancement in Electronics
Department of Electronics and Communication Engineering
Anantha Lakshmi Institute of Technology and Sciences

VOLUME-2

MAR-JUL 2022

ISSUE-2

Editorial Board

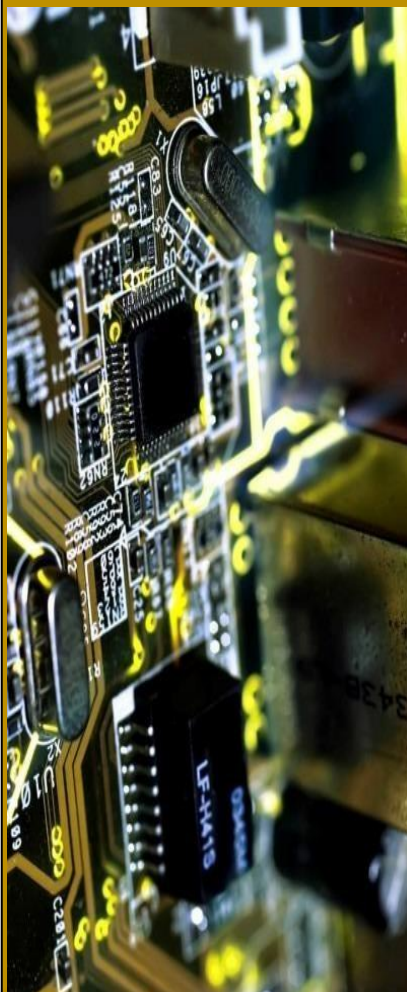
Dr. M. VENKATA SREERAJ
HOD OF ECE
E. GANGA SARASWATHI
ASSISTANT PROFESSOR

Students

Y. DIWAKAR
202G5A0419
K. UDAY SAI
192G1A0497



To produce professional engineers in Electronics and Communication with Ethical consciousness to meet local and global demands.



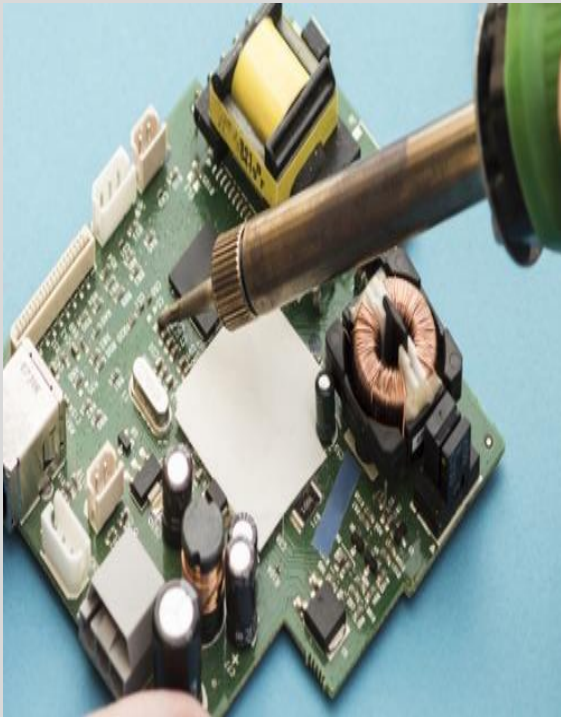
M1: Providing an ambience of teaching-learning process through the state-of-art infrastructure and modern tools for impacting latest technical latest technical skills among the students.

M2: Providing students centric facilities and training for the students to acquire a strong collaboration with Electronics Industry.

M3: Providing value-based education to find solutions for societal needs.



Program Educational Objectives (PEO's):



PEO1: Graduates can acquire the competent knowledge in Electronics and Communication Engineering.

PEO2: Graduates can have successful entrepreneurial and professional careers in the core and allied areas of electronics and communication engineering.

PEO3: Graduates can possess communicative skills and work efficiently on team-based projects in electronics, communication, with a sense of social responsibility.

Program Specific Outcomes (PSO's):

Students must be able to:

PSO1: Design and develop customized electronic circuits for domestic and industrial applications.

PSO2: Analyze and design the Digital Systems in Electronics using hardware and modern tools and fulfill the gap between academics and industry.

PSO3: Apply professional ethics and ethical responsibility to a successful career in open-ended problems of Electronics and Communication Engineering by adhering to technological changes.



IoT based Reduction of Electricity Theft

At present, energy theft is a major problem because it is precious but the available resources are limited and electricity theft is increasing. To overcome this issue, the proposed system is used like IoT based Reduction of electricity theft. This system is used to notice electricity theft and also checks the usage of energy & informs the customer. This system uses Wi-Fi connectivity to implement the IoT based network. Any difference in the utilization of electricity, then the data can be transferred through the internet to the remote server IoT has taken over the world by storm. The internet is everywhere nowadays, with IoT it becomes easier to establish a connection between things. This helps one to store and access data from anywhere in the world. Smart city plans are already on shelves and we can use this technology and incorporate them into our electric meters to make them smart, efficient, and less prone to theft. A smart meter measures the current across both the phase and neutral lines. The readings obtained from both are used to calculate the power consumption by a user. In this IoT project, you will learn to design a system that helps to minimize the electricity theft.



Working: The hardware and software components are assembled based on the algorithm developed. The code is programmed into the Raspberry Pi and tested using the Wi-Fi module to calculate the energy consumed by the meter. This prevents the theft of electricity and since the project uses IoT, one can survey it from anywhere in the world. The Raspberry Pi communicates with the Energy meter via GPIO pins. These pins get the data from the Energy meter and then sends it to the Pi. The Wi-Fi module interacts with the Pi using IoT. The electric meter uses the technology and calculates the current across the phase and neutral line separately. The readings thus obtained are used to calculate the power that is consumed by the user. The project focuses

on preventing the theft of electricity and also contributes to calculating the correct power consumption.

Conclusion:

The system uses IoT and this not only helps the user but also helps the government to find any dishonest customer. This reduces the stealing of electricity by the agents impossible. The Raspberry Pi interacts with the Wi-Fi module and sends all the data to the authorized website using IoT. The authorized person can access the data and check if there is any theft of electricity from the government helping them to identify the person behind it.

A. Tanish
202GaA0401

Fingerprint-based Driving License Management System

This project implements a system for driving license verification using fingerprint. This project is very useful to monitor the driving license through a biometric system which is easy and more suitable for monitoring. In this project, a prototype of the license verification system is implemented. In this project, a prototype is implemented like a verification system of automatic license. This system uses fingerprints to confirm personal identity. In this project, an accurate and faster algorithm is developed.

The general trend of human nature always longing for security Physically, Mentally and Socially. Fingerprint based security access control and identity systems are used for all kinds of office and service sector operations in the day today environment.

Fingerprint System based access control is more secured as compared to the conventional swipe card or ID cards because of the exclusive fingerprint for every entity. Fingerprint Systems have fascinated people for centuries. They have been used as a method of personal identification since ancient times.

The two key aspects of most of the Fingerprint System biometric solutions are Finger Print identification and authentication. The process of identification tells you who an individual is, or in the negative sense tells you who they are not.

Fingerprints Security is examined using two different sets of criteria. One way of looking at Fingerprint Security System is using their "Class Characteristics".

Finger Print Security Systems can be used to get rid of so many issues such as Physical Access Control, Health care Biometrics, Fingerprint and Biometrics Locks, Biometric Sensors and Detectors, RFID Tags, RFID Readers, Road Barriers, RFID Smart Card, CCTV, Metal Detectors, LED Search Lights, Fire Alarm, Finger Print Movement Control, Physical Access Control, Optical Fingerprint Scanners, Optical Sensors, Card Locks Card Access Control Systems, Fingerprint Technology, Digital Fingerprint, USB Fingerprint

Fingerprint System Authentication is a simpler process. It involves affirming or rejecting a claimed identity by matching a live template with an existing one. Most of these identification/ authentications are done by using Smart Card. The large growth of ID - Card based Fingerprint system security is wildly used in Public service applications.

These cards are used for multiple purpose applications such as Digital parking meters, telephone, vending machines, ATM Cards, Digital Fingerprint Security System Identity, Personal Identification Verification Number etc.

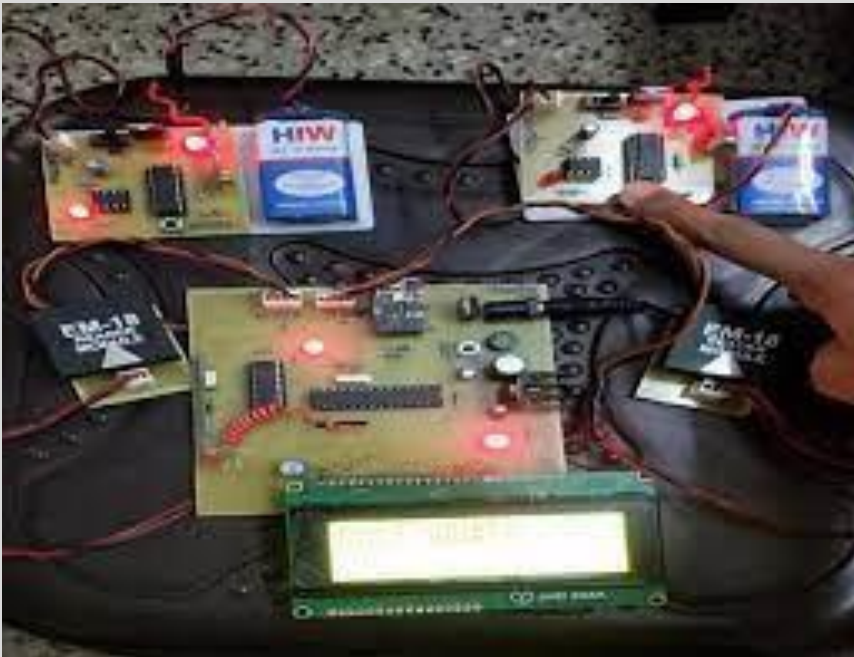
Another kind of Fingerprint System is the scanner using ultrasound. The process involves high frequency sound to identify a fingerprint. An advantage of ultrasound sensors is that they are not affected by external hindrances like dirt on a finger.

Thermal Fingerprint Security System Scanners work by measuring temperature differences used for a variety of security and data-collection purposes, from identifying prisoners to allowing access to information or high-security

Coal Mine System for Safety Monitoring & Alerting

The procedure of removing coal from the ground is known as coal mining. In different industries like cement, steel, and many more use this coal-like fuel. In underground mining industries, day by day different parameters can be monitored like temperature, methane gas, fire, etc.

The disasters in a coal mine will occur frequently which leads to a huge loss for humans due to several reasons. So monitoring of the working environment is very essential in the coal mine. So the proposed system is used for coal mining using IoT.



Coal mining is the process of extracting coal from the ground. Steel and cement industries use coal as a fuel for extraction of iron from iron ore and for cement production.

Underground mining industry comes to the category, where each and every parameter such as methane gas, high temperature, fire accidents and so on has to be monitored regularly. Safe production level of coal mine is still low, disasters in coal mine occur frequently, which lead to great loss of possession and life.

The disasters happening in coal mine are due to the complexity of mine environment and the variety of work carried out in coal mine, so it is very necessary to monitor the working environment of coal mine. To get over this problem, Nevon projects has proposed a wireless sensor network's application in coal mining safety system.

In this wireless sensor network's application system there will, be master controllers and slave controllers. Slave controllers will detect the danger and give alert through RF to master controller and it will raise the alarm in all tunnels and also raise message on IOT, which will help to take action as soon as possible.

This monitoring and alerting system is powered by Atmega328 microcontroller for master controller and 8051 micro controllers for slave controllers. 8051 micro controller consists of temperature sensor, water sensor, methane and carbon dioxide sensor and RF transmitter which collects temperature, humidity and methane values underground of coal mine.

C.Vamsi
202G1A0415

Microcontroller Controlled Robot Arm for Paint

There are different kinds of robots available which are used in different fields for different purposes like medical, industrial, exploration of space, military, etc. In this project, the microcontroller-based robot arm is developed.

The classification of these robots can be done like manipulator robots to assist with other automated otherwise semi-automated parts of equipment to attain different tasks like welding, painting with spray, assembling, loading, etc. In general, controlling robots can be done through a control device or a computer by using an algorithm or a specific program.

Abstract:

The purpose of this research is to develop an automated robot capable of painting on walls with low-cost tools.

The majority of safety concerns that arise when multiple tasks are performed concurrently can be addressed to protect people from potentially dangerous and difficult environments. You can take a picture with the Raspberry Pi's camera. After that, you can save the image to your computer.

After that, you can use this image as a guide to finish your painting. The estimated location of the spray gun is noted in the estimate. The artwork is shaped like a box. The Raspberry Pi module will be responsible for controlling the DC motors and actuators used in this project.



Actuators are the individuals who move the scissor lift arms up and down. When the Raspberry Pi on the upper platform transmits a signal, the signal is transmitted to the air compressor on the lower platform. It automatically starts and stops working as required.

The building and construction industry is estimated to account for a sizable portion of global GDP. Due to the accelerated pace of modern life, the construction industry is rapidly expanding and growing in size. On the other hand, construction workers are

in short supply. There are insufficient construction workers to complete the project due to its complexity. Many people believe that these jobs are no longer as necessary as they once were due to the increased number of college students.

Due to the system described below, an automated painting robot may have difficulty completing a painting on a specific wall. There should be a noticeable difference in the way the system paints on rough surfaces compared to how the majority of people paint on rough surfaces. You can combine both of these axes to create an infinite number of variations.

This is because they both have two degrees of freedom, which allows you to create anything you want. If this method is used, the cost of painting is expected to be significantly reduced.

Machines paint at a significantly slower rate than humans. This is because the type of paint operation required has a significant effect on the time required. It should be easier and less time consuming to use than painting an entire wall.

As a result, the time required to complete the entire various curve planning steps increases when working with complex designs. Painting takes time and effort. Additionally, employees must be aware of the hazards associated with potentially hazardous substances in the workplace. Manual painting is more precise than automated spraying, eclipsing both of the other two methods.

This method of wall painting is time consuming, physically demanding, and potentially dangerous. Spray-painting robots are a critical piece of high-tech machinery in the paint manufacturing industry. It is a popular choice for residents and visitors alike. There are currently no cost-effective methods for smoothing the surface of a wide variety of sprayed parts.

This is because there are so many different and intricate components that can be sprayed. For a long period of time, both the construction and automobile industries lacked automated painting systems. An immediate need exists for a mobile robot to clean the interior walls of residential buildings.

Self-driving robots could be used to paint walls. The painting robot can move in all directions and paint the entire surface area thanks to a vertical scanning arm attached to the base of a mobile robot. Along with being lightweight and inexpensive, the prototype's design should be straightforward and simple to paint. In the future, the interior walls of the building will require painting.

A painting robot will be stationed at the site. When the prototype was constructed, it was capable of covering a 16-square-foot section of wall in a single pass. Individuals frequently consume a significant amount of electricity. If people require electricity, they can connect the battery system to a nearby switchboard.

Due to the use of lithium-ion batteries, this was an excellent project. They did an outstanding job. We are confident that our plan is superior to the alternatives as a result of what we have learned. It must operate at a breakneck pace in order to accomplish this. We can extend the height of our prototype by up to eight feet for as long as necessary. This tutorial will walk you through the process of creating a self-painting robot for walls and other surfaces. It is equipped with a sensor, a driver circuit, and a dc motor. Individuals can paint more quickly when assisted by a robot. At the very least one of them should be finished. The painter in question will be entirely automated. In comparison to other inside-painting robots, this one is more user-friendly. Numerous factors contribute to this design's success, including its structural stability and the fact that it can be constructed using any material that is readily available and costs less than the building's budget.

N.Sravani
202G1A0438

Prepaid Coffee Dispenser with Biometric Recharge

This project is used to design a fingerprint module based prepaid coffee dispenser using biometric recharge. There are different biometric systems are available, in that fingerprint scanning is one of the best which gives reliable and good mismatch ratio. This project uses two technologies like biometrics and embedded systems. The fingerprint scanner used in this project is the FIM 3030N module that includes RAM, DSP & ROM.

This scanner works in two modes like master and user. Master mode is used to record the stored fingerprints in the ROM. Once this module is connected to the microcontroller then it can be used in user mode. This mode is used to verify the images which are scanned as well as stored.

In this project, the scanner is connected to the microcontroller so that the scanning process can be controlled. Once the scanning process is done, the coffee dispenser can be turned ON automatically. If the person attempts to scan his image after that the coffee machine doesn't turn on for him & generates a buzzer sound.

According to ancient Greek scripts BIOMETRICS means study of life. Biometrics studies commonly include fingerprint, face, iris, voice, signature, and hand geometry recognition and verification. Many other modalities are in various stages of development and assessment. Among these available biometric traits Finger Print proves to be one of the best traits providing good mismatch ratio and also reliable. The present scenario to operate a bank locker is with locks which are having keys. By this we can't say that we are going to provide good security to our lockers. To provide perfect security and to make our work easier, we are taking the help of two different technologies viz. EMBEDDED SYSTEMS and BIOMETRICS.

Firstly discussing about Biometrics we are concentrating on Fingerprint scanning. For this we are using FIM 3030N high voltage module as a scanner. This module has in-built ROM, DSP and RAM. In this we can store up to 100 users fingerprints. This module can operate in 2 modes they are Master mode and User mode. We will be using Master mode to register the fingerprints which will be stored in the ROM present on the scanner with a unique id.

When this module is interfaced to the microcontroller, we will be using it in user mode. In this mode, we will be verifying the scanned images with the stored images. When coming to our application the images of the persons who are authorized will be stored in the module with a unique id. To prove that the persons are authorized to enter that area they need to scan their images.

This scanner is interfaced to AT89S52 microcontroller. By using this controller we will be controlling the scanning process. After the scanning has been completed the coffee dispenser machine will be automatically activated. If an unauthorized person tries to scan his image then the machine doesn't activate for him and the buzzer gives sound.

The project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Siva Raghava Reddy
212G5A0433

