

A major Project Report

on

#### **ATTENDANCE SYTEM**

Submitted for partial fulfillment of the requirements for the award of the degree of **BACHELOR OF TECHNOLOGY** 

IN

### **ELECTRONICS AND COMMUNICATION ENGINEERING**

BY

J. SHIVATEJA

K. PREM SAF VITTAL 17911A04E9

K. APARNA REDDY 17911A04F3

17911A04E5 17911A04E9 17911A04F3

Under the esteemed guidance of

**CH. S. N. SIRISHA DEVI** 

Assistant Professor

Department of Electronics and Communication Engineering

VIII, Hyderabad.



VIDYA JYOYHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

(Permanently Affiliated to JNTUH, NAAC accredited, Hyderabad)

**Department of Electronics and Communication Engineering** 

(NBA accredited)

JUNE- 2021

A major Project Report

on

#### ATTENDANCE SYTEM

Submitted for partial fulfillment of the requirements for the award of the degree of

### **BACHELOR OF TECHNOLOGY**

#### IN

# ELECTRONICS AND COMMUNICATION ENGINEERING

#### BY

J. SHIVATEJA	17911A04E5
K. PREM SAI VITTAL	17911A04E9
K. APARNA REDDY	17911A04F3

Under the esteemed guidance of

#### CH. S. N. SIRISHA DEVI

Assistant Professor

Department of Electronics and Communication Engineering

VJIT, Hyderabad.



#### VIDYA JYOYHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

(Permanently Affiliated to JNTUH, NAAC accredited, Hyderabad)

**Department of Electronics and Communication Engineering** 

(NBA accredited)

#### JUNE- 2021

Department of Electronics and Communication Engl Vidya Lyothi Institute of Technology, I Hyderabad-500075

### VIDYA JYOYHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS) Permanently Affiliated to JNTUH, NAAC accredited, Hyderabad) 2020-2021 Department of Electronics and Communication Engineering

#### CERTIFICATE

This is to certify that the project work entitled "ATTENDANCE SYSTEM" is a bonafide work carried out by Mr. J. SHIVATEJA (17911A04E5), Mr. K. PREM SAI VITTAL (17911A04E9), Ms. K. APARNA REDDY (17911A04F3) in partial fulfillment of the requirements for the award of degree of BACHELOR OF TECHNOLOGY ELECTRONICS IN AND COMMUNICATION ENGINEERING by the JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD, under our guidance and supervision.

The results embodied in this report have not been submitted to any other university or institute for the award of any degree or diploma.

5772021

Department of Electronics and Communication Enga Vidya Jyothi Institute of Technology.

Hyderabad-500075

CH. S. N. SIRISHA DEVI

Assistant Professor Department of Electronics and **Communication Engineering** VJIT, Hyderabad.

Head of the Department Dr. K. VASAN

Department of Electronic and

**Communication Engineering** 

VJIT, Hyderabad.

Head of the Department Department of Electronics and Communication Engg. White Jysthi Institute of Technology. Hyderabad-500075

**External Examiner** 

ii

#### DECLARATION

This is to certify that the work reported in the present project entitled "ATTENDANCE SYSTEM" is a record of work done by us in the Department of ELECTRONICS AND COMMUNICATION Engineering, Vidya Jyothi Institute of Technology, Jawaharlal Nehru Technological University, Hyderabad. The reports are based on the project work done entirely by us and not copied from any other source.

J. SHIVATEJA K. PREM SAI VITTAL K. APARNA REDDY

Head of the Department Head of the Department Communication Edge Department of Electronics and Communication Edge Department of Electronics and Communications Hyderabad-500075

# ACKNOWLEDGEMENT

We express our sincere gratitude and indebtedness to our project **supervisor CH. S. N. Sirisha Devi** for his valuable suggestions and interest throughout the course of this project.

We are thankful to the **Head of the Department Dr. K. Vasanth** for providing excellent infrastructure and a nice atmosphere for completing this project successfully.

We express our whole-hearted gratitude to the Principal Dr. A. Padmaja for giving us spontaneous encouragement for completing the project.

We thank Dr. E. Sai Baba Reddy, Director of Vidya Jyothi Institute of Technology for encouraging us during the completion of the project.

We express our heartfelt thanks to the staff of the Electronics and Communication Department, Vidya Jyothi Institute of Technology, for helping us in carrying out the project successfully.

Head of the Department steadors.

#### ABSTRACT

This project is to develop a hybrid student attendance system which is based on fingerprint recognition of student in order to verify their attendance. In this project, an attendance system is developed for student to scan their fingerprint with provided hardware for a purpose to verify their attendance in all classes. At the same time, a web-based attendance system is developed for admin/lecturer to view and analyze student attendance by generating the attendance report and intimating the students having less attendance.

The main purpose of this system is eliminating the traditional attendance system by faster, accurate, and efficient system. With this new fingerprint recognition attendance system, we can eliminate some problems such as fake attendance, loss of attendance sheets, and control student skip class rate. This project is developed using VS Code editor, SQL, XAMPP server, MYSQL database. Finally, implementation of this system definitely provided more efficient, reliable, and accurate way to manage the student attendance data.

lined of the Department section Ford

v

ii iii iv v vi viii 1 1 2
iii iv v vi viii 1 1 2
iv v vi viii 1 1 2
v vi viii 1 1 2
vi viii 1 1 2
viii 1 1 2
1
1
2
4
2
3
5
10
10
11
12
12
14
15
15
16
16
17
17
18
19
20
20
22
22
28
28
29
29
30
31

# TABLE OF CONTENTS

Department of Electronics and Commencements Vidya Jyothi Institute of Technology. Hyderabad-500075 Vi

# List of Figures

SI. No	FIGURE NAME	Page No.
3.1	Block Diagram	10
3.3.1	Fingerprint Scanner	13
3.3.2.1	Node MCU	14
3.3.2.2	Node MCU pin diagram	14
3.3.3	OLED Display	15
3.3.4	Buzzer	15
3.3.5	LED	16
3.4.1	VS Code	17
3.4.2	Arduino IDE	18
3.4.3	MYSQL	18
3.4.4	XAMPP Server	19
3.5.1	Hardware Block Diagram	20
3.5.2	Software Block Diagram	21

5 Department of Lacenselies and Communication Vidya Jyothi Institute of Technology. Hyderabad-500075

-----

vii

### CHAPTER 1 INTRODUCTION

#### **1.1 Problem Statement**

Student academic attendance is very important since it will affect the students from gaining knowledge and skills as well as their grades. This project is related to the student attendance system through the matching of their fingerprints to confirm their attendance. The main purpose of carrying out this project is to develop a web-based student attendance system. As we know, every individual has a unique fingerprint and never matches with any other person's fingerprint. So, the fingerprint attendance system can be known as the best authentication to detect the individual student attendance record. According to the technology, it is not unusual anymore to take the attendance of students through their fingerprint.

Nowadays, most of the universities and colleges are still using the traditional attendance system. Using the traditional attendance system, we can obviously see that there are few problems such as there will be no backup for the attendance records if the lecturer accidentally lost the attendance sheet, hard analysis and tracking student performances based on attendance factor, student lack of knowledge and skills due to the poor attendance in attending classes, and etc. It is important to overcome these problems since it will help in improving the academic performance of students as well as the teaching environment of the lecturers. Hence, the purpose of carrying out this project is to prevent unwanted situations from occurring and to find out the problems that cause these problems as well as find the solutions to overcome these problems.

Thus, through the problems analysed, the objective of this project is to develop a web-based fingerprint student attendance system in recording their attendance effectively in every class in order to prevent students from skipping classes and we have done it. Additionally, it will be easier to evaluate and analyse the student performance based on their attendance since the system will record the attendance more accurately and efficiently with minimum possible error. Furthermore, student academic performance will increase as well, since they cannot fake their attendance through the developed system which means they have to attend all the classes in order to prevent them from getting a bar.

... aliv.

ent of Electronics and other (Autority)

Department of Electronics

Finally, this system includes several modules which are attendance module, email module, report module, fingerprint module. In order to ensure the system can help in improving the student attendance as well as provide the accurate and efficient information regarding the student attendance. As a conclusion, using an electronic based system is better than using a paper-based system in order to collect, process, store, and produce the attendance results and perform longterm analysis.

#### **1.2 Objectives**

In developing this system, some project objectives had been specified. The main purpose of this project is to improve the current existing student attendance system that is in use by most of the colleges/universities by developing a fingerprint-based student attendance management system. Some objectives of this project had been identified and listed below.

- To replace the current existing student attendance system process to fully computerized and automated student attendance system.
- To develop a web-based student attendance system in displaying every student attendance results effectively
- To generate reports regarding the student attendance in order to assist the lecturer/staff in analysing and tracking the student attendance.
- To provide an easier method to evaluate and analyse the student performance based on their attendance since the system will record the attendance more accurately and efficiently with minimum possible error.

#### 1.3 Scope of Study

The scope of this project is to develop a hybrid student attendance management system through fingerprint scanning. In this project, a Web-based student attendance system is developed for a purpose just to obtain the fingerprint of students who attend the class. Additionally, this system is used for many purposes like to display the attendance status/condition of every student, generate reports related to the student attendance, and etc. Besides that, proper planning will be carried out in order to perform this project by using the project methodology that had been chosen.

Department of Electronics and Communication Entitle

Next, the student attendance management system will only be developed for managing the student attendance status and allow lecturers/faculty staff to easily analyse the information regarding the student attendance. In other words, it means that this attendance system will only cover the functions related to student attendance but not any other functions related to another thing. So, at the end of the project, a system is developed which is used for recording the attendance of students more efficiently and effectively through fingerprint scanning. The purpose to carry out this system is to overcome the current problems in their current attendance system faced by the school, college, and university. There are some modules covered in the product scope.

The intention in developing this Attendance System is to computerize the traditional way of taking attendance as it consumes lots of time and causes disturbance during attendance.

Another purpose to develop this software is to get the accurate report of the attendance automatically at the end of the day or in the middle, etc. as per requirement. This model is completely a web application which is a self-controlled software.

#### 1.4 Significance of Study

In the developed project, some contributions are identified. By implementing the fingerprint attendance system, it will definitely provide a more accurate and efficient record of student attendance that is fully utilized by the computerized system. By using this system, users will surely realize that this system process will be faster and simpler compared to the current complex-existing system. Other than that, this system can assist lecturers in taking the student attendance more effectively without worry about losing or damaging their attendance sheets while passing it among the students around the whole class.

In addition, as mentioned earlier, most universities are currently using the traditional attendance system method which requires a lot of attention from the students. Although the traditional attendance system seems very effective, it is a kind of time-consuming process and will disturb the students who are concentrating on listening to the lecture.

So, to prevent these things from happening again, in the enhanced system, the system is developed which requires students to match their fingerprint once entered the class with the hardware provided in the class.

Using fingerprints to retrieve student attendance can be considered as one of the enhanced system Head of the Department of Electronics and Communication English innovations. Furthermore, lecturers no longer need to key in the student attendance to the system

Jynhi Institute of Technology. Hjderabad-500075

by themselves at almost the end of the semester which may require them to recheck again and again to confirm that they key it in correctly to the current system. In the enhanced system, lecturers do not need to key in the attendance on their own as the system will automatically record all the attendance status into the system on its own once the class ends.

Lastly, the contribution presented in this system will definitely help the lecturer in handling the student attendance record more conveniently and accurately. It will provide a better teaching environment for the lecturers as lecturers will no longer face the empty classroom every time while they are lecturing in front the stage through the implementation of fingerprint attendance system. Not only that, students will also definitely increase their student academic performances. Therefore, this system has to be developed because it will help in saving time from unnecessary processes and promote very accurate and efficient ways in recording the student's attendance.

4

thead of the Oryaning in the intering of the industry

#### **CHAPTER 2**

#### LITERATURE REVIEW

The Internet of Things (IoT) is rapidly changing the way we interact and gain information about ourselves and the external world. Based on the IoT paradigm, a prototype of a cloud-based end-to-end Smart Attendance System has been developed which attempts to solve the problems of manual attendance system prevalent in school and colleges by performing automated attendance record generation, reporting, monitoring and alert generation for different stakeholders of the educational institute. To reduce the overall time required to take the attendance in the class the attendance device is made portable, so that it can be easily circulated among students to mark their attendance [1]. The register based conventional attendance system for the students in our educational institution is laborious, time consuming and kind of a boring task for the educators. An intelligent system based on fingerprint scanners has been designed and implemented that supplanted the traditional mundane attendance system. The system can acquire, store, crosscheck the fingerprint of individuals and export the data in the form of Microsoft Excel spreadsheet in a memory module. The entire procedures are supervised by a microcontroller. This smart attendance kit is portable, handy, cheap and reliable [2].

A hand-held device is used to mark attendance without the intervention of the teacher. The device can be passed and students can mark attendance during the lecture time. Students would be made to place their finger over the sensor so as to mark their presence in the class. It can communicate with a host computer using its USB interface. This device operates from a rechargeable battery. The GUI application in the host computer helps the teacher to manage the device and attendance. If we talk about the current scenario of our education system then we found that we have a lot of technologies to use but still we are following the traditional system. If we talk about the attendance system in universities and schools, lecturers did that work manually. Lecturers took the attendance and updated it manually in the database. If we talk about technology then we found that there are a lot of tools to use and reduce the burden of lectures. Using RFID is one example of that. We if combine the RFID and IOT (Internet of Things) then we can do it automatically and there is no need to do it by lectures. Here we are planning to use the Cloud as storage for better performance. Using IOT and Cloud we can access it from anywhere and anytime which will provide us with better proficiency and flexibility [4]. The ongoing project for recording examination attendance using Radio Frequency Identification (RFID). It is carried out to test in a university, where the system which is named Portable Examination Attendance System (PEAS) is

in the frame of the Department of the Lagetent of the frames and Constraints after Lage-Vidya Jyoth Institute of Technology-Byotrabad-S00075

bepariment of

integrated with the existing system for record extraction. The use of RFID technology enables the university management to avoid attendance forms from damages such as tear, loss, and misplaced. This paper describes the design and development of PEAS in terms of hardware technology and software. In addition, some related works are reviewed and addressed to support this project. As a conclusion, this paper states some future works of this project.

The design and development of a portable classroom attendance system based on fingerprint biometric is presented. Among the salient aims of implementing a biometric feature into a portable attendance system is security and portability. The circuit of this device is strategically constructed to have an independent source of energy to be operated, as well as its miniature design which made it more efficient in terms of its portable capability. Rather than recording the attendance in writing or queuing in front of class equipped with a fixed fingerprint or smart card reader. This paper introduces a portable fingerprint based biometric attendance system which addresses the weaknesses of the existing paper-based attendance method or longtime queuing. In addition, our biometric fingerprint-based system is encrypted which preserves data integrity [6]. A smart attendance system that automatically monitors and manages the attendance of students in an educational institution. Further, this system makes automated analysis and prepares a detailed report weekly, monthly and annually. The whole system is developed with an Arduino microcontroller and RFID readers. Also, GSM and Wi-Fi communication modules are used to make convenient communication depending on the availability of the network. A microchip (microSD) is placed to store data in case of communication failure and those stored data will be uploaded bulk when the communication channel is restored. This system will reduce a lot of manual work of educators and education administrators of an education institution. It also utilizes the fundamentals of Internet of Things (IoT) for data transfer, storage and display. The system can be interpreted based on its hardware and software aspects. The hardware section consists of a pod, which is a portable device that can be circulated among students in the classroom. It features an LCD screen that displays various functional options and a, which can scan, store and identify student fingerprints. The identified fingerprint ID is then stored in memory and is made ready for transfer. The data is then sent to the database on a web server where the Database Management System (DBMS) updates the attendance tables accordingly. This database can be downloaded or viewed by the respective faculty [8].

A portable wireless biometric attendance system for academic purposes has been designed and developed using fingerprint sensor and NodeMCU microcontroller. One of the cardinal features of this system is the portability of this system and also the reduction of time

Head of the Department Head of the Department Department of Electronics and Communication Enge-Vidya Jyothi Institute of Technology-Hyderabad-500075 consumption compared to the conventional stationary wired/wireless systems where students have to stand in serials and wait for his/her turn which costs a good amount of time during a class period. The smaller size of our system has enabled the students to pass the device from one to another without interrupting the class lecture and saves valuable time of the class lecturer which is generally a fixed period of time. All the data of a particular student are stored in a database when a student's finger is registered for a particular institute and after that whenever the student enrols, his/her attendance is counted automatically and stored in the destined database wirelessly. The attendance marks based on attendance percentages of the students are automatically calculated and uploaded on the webpage. So, whenever a semester finishes the course teacher can get percentage information as well as the corresponding attendance marks of all the students without having a headache for the entire semester. Our system also notifies the user if any student is absent for 10 successive classes [10].

Biometric student attendance system increases the efficiency of the process of taking student attendance. This presents a simple and portable approach to student attendance in the form of an Internet of Things (IOT) based system that records the attendance using fingerprint based biometric scanner and stores them securely over cloud. This system aims to automate the cumbersome process of manually taking and storing student attendance records. It will also prevent proxy attendance, thus increasing the reliability of attendance records. The records are securely stored and can be reliably retrieved whenever required by the teacher. Propose a system in which fingerprint verification is done by using extraction of minutiae technique and the system that automates the whole process of taking attendance, manually which is a laborious and troublesome work and waste a lot of time, with its managing and maintaining the records for a period of time is also a burdensome task. For this purpose, we use fingerprint verification systems using extraction of minutiae techniques. The experimental result shows that our proposed system is highly efficient in verification of user fingerprint [11][12].

A system that takes attendance of students and maintains its records in an academic institute automatically. Manually taking attendance and maintaining it for a long time makes it a difficult task as well as wastes a lot of time. For this reason, an efficient system is designed. This system takes attendance with the help of a fingerprint sensor module and all the records are saved on a computer. Fingerprint sensor module and LCD screen are dynamic which can move in the room. In order to mark the attendance, the student has to place his/her finger on the fingerprint sensor module. Or identification of a particular student, his attendance record is updated in the database and he/she is notified through LCD screen. In this system we are going to

Head of the Department Department of Electronics and Communication Enge. Vidya Jyothi Institute of Technology. Hyderabad-500075

generate Microsoft Excel attendance reports on the computer. This report will be generated automatically after 15 days (depending upon user). This report will be sent to the respected HOD, teacher and student's parents email Id [13]. A fingerprint recognition system based on minutiaebased fingerprint algorithms used in various techniques. This line of track mainly involves extraction of minutiae points from the model fingerprint images and fingerprint matching based on the number of minutiae pairings among two fingerprints. This paper also provides the design method of fingerprint-based student attendance with help of GSM. This system ignores the requirement for stationary materials and personnel for keeping records.

An IoT-enabled server device which is capable of authenticating a person by fingerprint recognition and grant access to the client application for making the attendance logging possible with the increased level of security. The ability of the device is to provide precise matching of fingerprints increases the possibility of error-free attendance logging. The impact of such approach is to provide the easier use of biometric attendance system in classrooms and offices with the Wi-Fi coverage. For security purpose, the client application provides the password to the device for protection from unauthorized access [15]. A Wireless fingerprint attendance management system is designed and implemented. This system-based biometrics and wireless techniques solve the problems of spurious attendance and the trouble of laying the corresponding network. It can make the users attendance more easily and effectively [16].

In recent time, there has been high level of impersonation experienced on a daily basis in both private and public sectors, the ghost worker syndrome which has become a menace across all tiers of government, employers concern over the levels of employee absence in their workforce and the difficulty in managing student attendance during lecture periods. Fingerprints are a form of biometric identification which is unique and does not change in one's entire lifetime. This paper presents the attendance management system using fingerprint technology in a university environment. It consists of two processes namely; enrolment and authentication. During enrolment, the fingerprint of the user is captured and its unique features extracted and stored in a database along with the user's identity as a template for the subject. The unique features called minutiae points were extracted using the Crossing Number (CN) method which extracts the ridge endings and bifurcations from the skeleton image by examining the local neighbourhoods of each Head of the Department Head of the Department Control of Electronics and Communication Engle Department of Electronics and Communications ridge pixel using a 3 x 3 window.

8

During authentication, the fingerprint of the user is captured again and the extracted features compared with the template in the database to determine a match before attendance is made. The fingerprint-based attendance management system was implemented with Microsoft's C# on the. NET framework and Microsoft's Structured Query Language (SQL) Server 2005 as the backend [17].

A smart fingerprint based biometric attendance system that works over IOT so that attendance can be monitored from anywhere in the world. We are using a Arduino mega microcontroller and finger print module. Now, the online system stores and displays the required data to users as per online login. Thus, our system allows for remote monitoring of biometric based attendance from anywhere over IOT [18].

9

Head of the Department Department of Electronics and Communication Engle Units and Communications of Technology.

## CHAPTER 3 METHODOLOGY

# 3.1 BLOCK DIAGRAM



?



# 3.2 WORKING:

### Implementation:

- 1. The Finger Print Sensor is interfaced with the Arduino board.
- 2. At the beginning, your finger will be scanned by placing your finger on the scanner.
- Once your finger is scanned, the scanner will generate template by Image Processing method which will be stored for comparing.
- 4. Like this we will store all the templates of different people.
- 5. So, when we place our finger, the scanner will scan the finger and it will generate template and this template will be compared with previously stored templates
- 6. If both templates are matched, then certain people data stored will be shown on the OLED.

The data regarding how many students were present on day-to-day basis can be updated in data base rather maintain ledgers and record books and can be retrieved whenever we want. In this project, we have used a NODEMCU Module for interfacing, we used 2 LEDs for fingerprint success or not,1 buzzer for different function indication. We have interfaced OLED which displays everything whenever the finger is placed or removed, or registering attendance or downloading data.

# ESP8266 Insert Data into MySQL Database using PHP and Arduino IDE:

In this project you'll build an ESP32 or ESP8266 client that makes an HTTP POST request to a PHP script to insert data (sensor readings) into a MySQL database.

You'll also have a web page that displays the sensor readings, timestamp and other information from the database. You can visualize your data from anywhere in the world by accessing your own server.

As an example, we'll be using a fingerprint sensor connected to an ESP board. You can modify the code provided to send readings from a different sensor or use multiple boards.

Head of the Department Department of Electronics and Communication Enge Vidya Jyothi Institute of Technology. Hyderabad-500075 11

# PROCESS:

At the initial stage the user should Register their respective Fingerprint using the device provided in the circuit and user should fill all the required details. In the same manner all the users should register their fingerprints. All those finger print models are saved in the Fingerprint scanner device and all other details like email-ids, name, roll number and other data are stored in the database.

Everyday user should give their thumb impression for attendance, if the fingerprint matches with the data present in the device, then it displays like 'ATTENDANCE TAKEN', if not it displays like 'PLACE YOUR FINGER AGAIN'.

The internal process will be done like, whenever the user places his finger for attendance, it undergoes comparison with the stored finger print model if it is successful then using the interfacing device, we will communicate with the database and store the regular data of the users. Using the website which is consists of all the functionalities like Sending mails, Percentage calculations, Displaying the attendance graphs and many more will be done.

At the time of registration all the details of the user are filled and that data is stored, using that data to the respective mail ids emails will be sent if the user has less percentage (less than 60%). With the help of java script code written, the Percentages will be calculated by considering daily login data. Using a library called "charts.js" we will generate the respective graphs.

Head of the Department Department of Electronics and Continue Meridian Video Longia Institute Activeburghese

#### 3.3 Hardware Requirements:

#### 3.3.1 Fingerprint Scanner (R307):

#### What is a Fingerprint Scanner?

A fingerprint scanner is a type of technology that identifies and authenticates the fingerprints of an individual in order to grant or deny access to a computer system or a physical facility.

It is a type of biometric security technology that utilizes the combination of hardware and software techniques to identify the fingerprint scans of an individual.

A fingerprint scanner typically works by first recording fingerprint scans of all authorized individuals for a particular system or facility. These scans are saved within a database. The user requiring access puts their finger on a hardware scanner, which scans and copies the input from the individual and looks for any similarity within the already-stored scans. If there is a positive match, the individual is granted access.

Fingerprint scanners most commonly use an individual's thumbprint as identification.



3.3.1 Finger Print Scanner

Head of the Department Head of the Department Oppartment of Electronics and Constantications Lagge Vidya Jyothi Institute of Technology, Vidya Jyothi Institute of Technology, Hyderabad-500075

### 3.3.2 NODEMCU:

#### What is a Node MCU?

NodeMCU is an open-source Lua based firmware and **development board** specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif



The NodeMCU ESP8266 development board comes with the ESP-12E module containing ESP8266 chip having Tensilica Xtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at 80MHz to 160 MHz adjustable clock frequency. NodeMCU has 128 KB RAM and 4MB of Flash memory to store data and programs. Its high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating features make it ideal for IoT projects. NodeMCU can be powered using Micro USB jack and VIN pin (External Supply Pin). It supports UART, SPI, and I2C interface.

#### Programming NodeMCU ESP8266 with Arduino IDE

The NodeMCU Development Board can be easily programmed with Arduino IDE since it is easy to use. Programming NodeMCU with the Arduino IDE will hardly take 5-10 minutes. All you need is the Arduino IDE, a USB cable and the NodeMCU board itself.



3.3.2.2 NODEMCU PIN DIAGRAM

Head of the Department Department of Electronics and Communication Eags. Vidya Jyoihi Institute14 Technology.

# 3.3.3 OLED DISPLAY:

# What is an OLED Display?

OLED (Organic Light Emitting Diodes) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted. OLEDs are emissive displays that do not require a backlight and so are thinner and more efficient than LCD displays (which do require a white backlight).

OLED displays are not just thin and efficient - they provide the best image quality ever and they can also be made <u>transparent</u>, <u>flexible</u>, foldable and even rollable and stretchable in the future. OLEDs represent the future of display technology.



3.3.3 OLED DISPLAY

#### **3.3.4 BUZZER:**

#### What is a Buzzer?

The **buzzer** is a sounding device that can convert audio signals into sound signals. ... It is widely used in alarms, computers, printers and other electronic products as sound devices. It is mainly divided into piezoelectric **buzzer** and electromagnetic **buzzer**, represented by the letter "H" or "HA" in the circuit.

Defiartment of Electronics and Confgunkeation Enga-Vidya Jyoht Institute of Technology-Vidya Jyoht Institute of Technology-

The **buzzer** consists of an outside case with two pins to attach it to power and ground. ... When current is applied to the **buzzer** it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's the sound that you hear.



3.3.4 BUZZER

#### 3.3.5 LEDS:

A light-emitting diode is a two-lead semiconductor light source. It is a p-n junction diode that emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons.

As is evident from its name, LED (Light Emitting Diode) is basically a small light emitting device that comes under "active" semiconductor electronic components. It's quite comparable to the normal general-purpose diode, with the only big difference being its capability to emit light in different colors. The two terminals (anode and cathode) of a LED when connected to a voltage source in the correct polarity, may produce lights of different colors, as per the semiconductor substance used inside it.



3.3.5 LEDS

### 3.4 Software Requirements: 3.4.1 Visual Studio Code:

#### What is VS CODE EDITOR?

Visual Studio Code is a lightweight but powerful source code editor which runs on your desktop and is available for Windows, macOS and Linux. It comes with built-in support for JavaScript, TypeScript and Node.

Head of the Department Department of Electronics and Communication Enga-Vidya Jyothi Instil Gr of Technology. Hyderabad-500075

Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs,



### 3.4.1 Visual Studio Code

Visual Studio Code (famously known as VS Code) is a free open-source text editor by Microsoft. VS Code is available for Windows, Linux, and macOS. Although the editor is relatively lightweight, it includes some powerful features that have made VS Code one of the most popular development environment tools in recent times.

### 3.4.2 Arduino IDE What is Arduino IDE?

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuine hardware to upload programs and communicate with them.

#### How to program Arduino?

The basic Arduino code logic is an "if-then" structure and can be divided into 4 blocks:

Setup - will usually be written in the setup section of the Arduino code, and performs things that need to be done only once, such as sensor calibration.

Input - at the beginning of the loop, read the inputs. These values will be used as conditions ("if") such as the ambient light reading from an LDR using analogRead().

Manipulate Data - this section is used to transform the data into a more convenient form or perform calculations. For instance, the AnalogRead () gives a reading of 0-1023 which can be

# mapped to a range of 0-255 to be used for PWM. (see analogWrite())

Output - this section defines the final outcome of the logic ("then") according to the data calculated in the previous step. Looking at our example of the LDR and PWM, turn on an LED only when the ambient light level goes below a certain threshold.



3.4.2 ARDUINO

#### **3.4.3 MYSQL**

#### What is MYSQL DATABASE & USES?

MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.



MySQL is a database management system. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add, access, and process data stored in a computer database, you need a database management system such as MySQL Server.

Head of the Department of Electronics and Communication Loggothi Institute of Technology. Hyderabad-500075

**MySQL** is a relational **database** management system based on SQL – Structured Query Language. The application is **used for** a wide range of purposes, including data warehousing, e-commerce, and logging applications.

The most common use for MYSQL however, is for the purpose of a web database. It can be used to store anything from a single record of information to an entire inventory of available products for an online store.

In association with a scripting language such as **PHP** or **Perl** (both offered on our hosting accounts) it is possible to create websites which will interact in real-time with a MYSQL database to rapidly display categorised and searchable information to a website user.

#### 3.4.4 XAMPP SERVER:

What is XAMPP Server?

XAMPP is an abbreviation where X stands for Cross-Platform, A stands for Apache, M stands for <u>MYSQL</u> and the P's stand for PHP and Perl, respectively. It is an open-source package of web solutions that includes Apache distribution for many servers and command-line executables along with modules such as Apache server, <u>MariaDB</u>, PHP, and Perl.



#### 3.4.4 XAMPP SERVER

XAMPP helps a local host or server to test its website and clients via computers and laptops before releasing it to the main server. It is a platform that furnishes a suitable environment to test and verify the working of projects based on Apache, Perl, MySQL database, and PHP through the system of the host itself. Among these technologies, <u>Perl</u> is a programming language used for web development, <u>PHP</u> is a backend scripting language, and MariaDB is the most vividly used database developed by MySQL

Head of the Department Department of Electronics and Communication Enge. Vidya Jyotht Institute of Technology. Hyderobaú-500075

### 3.5 FLOW CHART:



# 3.5.1 Flowchart for Fingerprint Authentication:

# 3.5.2 Flowchart of Web-application:



#### 3.6 Circuit Diagram



#### **CHAPTER-4**

#### RESULTS AND DISCUSSION

#### 4.1 Result:

The experimental model was made following the circuit diagram and the desired results were obtained. Every time someone places his/her finger on the sensor, the sensor reads the data and stores it in the cloud. Next time someone wants to check the fingerprint he/she places the finger on the sensor. The sensor reads the data and searches and cross-checks the data with stored fingerprints. If it matches with any of them then it displays the username, date and time. If not then says fingerprint doesn't match. Each student can give attendance only once in a day if user tries to give attendance, then the system shows as Attendance is Already Given.

Every finger print model possesses a unique ID. By Placing the finger on the device, the finger print gets scanned. After getting scanned the unique ID will be stored in the database using an interface device called NODEMCU which communicates with the help of Internet

Our proposed system has website which will give the accurate attendance of the students in required way. The website can give the attendance details as follows:

- Section Wise Attendance Performance: It gives the performance of all the sections in the graphical way.
- Sending Mails For the students below 60% Attendance: In this block we need to select the section and after that we get the list of the students who are having less than 60% attendance
- Search by roll number: Here, in this we will get the attendance of individual student by giving the roll number. It is displayed in chart form.
- Monthly Attendance: We can get the month-wise attendance of each section. For this the admin has to select the section and submit, later attendance of each student is displayed according to the month.

Electronics and Contanunitation cauge othi Institute of Technology. eba6-500075 rtment of 22

# SOFTWARE OUTPUT:

1. HOME PAGE: It contains 4 blocks with different functionalities.

	eatures
Section Wise Attendiance Performance Text two over an its performance of the sectors Search by Roll Number	Sending mails for the students below attendance 60%. Four news carees tarder de dead a potente care. Monthly Attendance Dear said : the proteining attributes of the

2. SECTION WISE PERFORMANCE ANALYSIS: In this webpage we can get performance of all the sections based on monthly attendance.



Department of Electronics and Commiglication Enge. Vidya Jyothi Institute of Technology.

#### SOFTWARE OUTPUT:

1. HOME PAGE: It contains 4 blocks with different functionalities.

	estures	
Section Whe Attendance Performance Technologic de la anticipación de la activi	Served may make for the electronic before attendance 80%.	
Search by Roll Number	Monthly Attendance	

2. SECTION WISE PERFORMANCE ANALYSIS: In this webpage we can get performance of all the sections based on monthly attendance.



3. SEARCH BY ROLL NUMBER: In this Webpage we can get attendance details of an individual student by enterning his roll number.

and the second second	Rich	MK Attendants
	Search w	ith Roll Number
	Continued 2	
	Copied The Ampio	Charley Turn Andrea
		Mar Mar
	Lange	EBT Inspections

4. SENDING MAILS PAGE: Using this webpage we can send mails to the students having lesser attendance percentage.

	Send	mail to the st	tudents whose atte	ndance is les	ss than 60%	
	And Hadrent. 2					
	Los Aul Burner	-	Erel	Percentage	No of desire present	
	1 PHIMORY	Dain Dyr ia mr	visupara??6.\$grist.com	E.	85/28	
	2 191145459	Plan Sa'y Wel	proved bit indigenalization		18.29	
_						
			a tapagat suci Al alpan mare	-		
			in Copenyal auto - Al rigani anno	4		
	10		A Coping K.B.D. Al Spin more	-		
	11		A Copergit and 1 Al Spin more	-		
	11	V	A Copergification (A) Agent more	-		
-	11	N.	A Copergitation Ad refer enve	-		
-	. []		A Eppeqik ALT, Al Apri and			
	. ()	n'	A Copergit ACT. Al fight even	et in the second se		
	5		A Copergit AC. 7.4 spin more			
			A congrado 34 spectros	ter Late		
	20	in the state	Department	thos Eath-		

5. MONTHLY ATTENDANCE: In this webpage, we can get monthly attendance percentages of all the students based on moth-wise considerations.

KNN Name	- Contraction	 and the	and the second	and and		Student Atlanda	Ince	- The second second	A
No.     None     May     Magazi     September     Ottober     Nonember     Descenter       1     NZ     67%     NK     0%					Мо	nthly Atten	dance		
B.Ne     Jame     Jame     Jame     Jame     Segmentation     October     Normandation     Descenter       1     R.Z     S.T.     MA     D'A     D'A <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>									
1     RZ     673     884     674     874     876	8.94	-	-	-	August	September	October	homester	
1 112 174 175 75 75 75 75 75 75 75 75 75 75 75 75 7		RYZ	67%	-		-	25		-
1 102 674 705 705 705 705 705 705 705 705 705 705		XVZ.	87%	115	05	-	-		
4 102 C5 175 13 19	1	812	676	70%	-	-	-		4
		872	475	12%	-	-	-		
1 107 UK 105 105 10 10 10 10		892	175	87%	2%	-	-		
4 X7 874 783 78 78 78 78 78		X17	87%	71%	0%	25	-		
7 102 673 1115 65 65 65 05 05 05	7	xiz	475	185	6%	0%	0%	0%	

6. MAIL SUCCESSFULLY DELIVERED PAGE: This is the webpage displayed after successfully delivering the mails.

		Student Attendance	
		Mail Delivered Successfully	
	Mail has been Delivered to respective mail id's phivajaina0745@gmail.com premsai2030@gmail.com		
			Thanks for using our Product.
-		to Copyright 2011 - Ad lights moment.	
	11	ý.	
	2 Mm	read of the Department Electronics and Communication Electronics and Communication	1 1 12
	Department of	Hyderabad-500013 25	
	Department of	Electronits unt of term a lyothi Institute of 10075 Hodecabad-500075	

7. MAIL SENDING FAILED PAGE: This is the webpage displayed when mails are not delivered successfully.

	Student Attendance			C. Martin
	Mail Failed To Delive	H		
Der bisinter Issues mali has is	of lower server to the mashering free masters may	te of sever down to internal tode pastor	ND4	
House	excess as we will be to sell out the proble	n as fait as we can		
			Thunks for using our Product.	
	© Crearight and - All rights rese	uest.		
	and the second se	and the second		and the second second

8. MAIL OUTPUT: This is the Mail which will be sent to the students having lesser attendance.

(-	0 0 0 0 0 0 0	t of the Sealer and Sealer
1	From HOD ECE, VJIT How *	• 0
0	vernsairApgmail.com a dhaqidaa) 24.ma -	201 21 (11) minutesi kont 😰 🌨 📋
	HOD ECE	
	here by inform you that your percentage a less than 60% upto date. So kindy altered the chosen and movemer your percentage	
		Prom HOD ECE XYZ
	Reply ( Reply to all Forward	
	Head of the Department Head of the Department Communication Enge Department of Electronics and Communication Department of Electronics Udya Jynthi Institute of Technology. 18juerabad-500075 18juerabad-500075 26	

### Hardware Output:

# Working Model:







Department of Electronics and Communication age: Vidya Jyothi Institute of Technology. Electronic Subjects

#### **4.2 Applications:**

#### EDUCATIONAL INSTITUTIONS:

It can be used in any kind of educational institutions to get the accurate attendance of the students. It can also mail to the students having lesser percentage (less than 60%).

• OFFICES:

An Attendance Management System can keep track of employee attendance, work assigned, leaves, overtime, and more from a single, integrated platform.

#### 4.3 Advantages

- No work is to be done by anyone to calculate the attendance, plotting graphs, Sending mails etc.
- Cost Efficient
- Time Saving
- High efficiency
- Duplicate data entry can be reduced
- Informs parents regularly about the student's performance

Head of the Department Department of Electronics and Communication Enga-Vidya Jyothi Institute of Technology. Hyderabad-500075

# **CHAPTER 5** FUTURE WORK

#### 5.1 CONCLUSION:

In conclusion, fingerprint recognition attendance system is developed to replace the traditional attendance system that are currently widely used by many colleges and universities. This system is designed to make the whole attendance taking process to become more reliable, convenient, efficient, and accurate. Besides that, with the implementation of biometric technology which helps in reducing errors and attendance data is be able to compile in easier ways.

This project is designed to aim in eliminating spotted problems during the initial analysis. The problems spotted include loss of attendance sheet, skip class issue, and hard in analyzing student attendance record from time-to-time. These problems are the major problems faced by most colleges and universities. If viewed from the Pareto analysis side which is also known as 80-20 rule, 80 percent of the problems are always caused by the 20 percent problems. In short, it means that most of the problems faced are mostly because of the usage of the traditional student

Therefore, this project is designed in effort to eliminate these problems. Some solutions had been applied to eliminate these problems which included the use of biometric technology, changing the current system to a fully-computerized system, providing an easier way to generate reports, and student lateness policy to eliminate the "last minute come in take attendance" kind of student.

With the proposed solutions, obviously we can not only can eliminate these spotted problems but at the same time we can also promote very reliable ways in managing the student attendance record. On the other hand, from the survey questionnaire data, most of the participants agree that student attendance in a class to increase their knowledge is very important.

chonics and Continunication Enge Head of the Department a Jyoth Institute of Technology. Hyderabad-500075 Department of Elec

29

# 5.2 FUTURE ENHANCEMENTS:

"The Fingerprint Recognition Student Attendance Management System can be accessed only by a single faculty or admin ". In future, it is assumed that this system will be enhanced with many other features with multiple accessibility to be used by all faculties in organizations. Other than that, the system developed is more focused on the admin role which results in fewer features provided to the student role.

In future work, students should be able to appeal through the system directly without needing to go to find that lecturer who barred them. There is no other available option for the lecturer to generate the report. Besides that, the system developed only can be used on desktop or laptop but smartphones are not recommended for this system. Therefore, in future work, this system should focus more on smartphone development to ease the attendance process.

Finally, the Fingerprint Recognition Student Attendance Management System will still have a lot to improve in order to meet every role's requirement. However, the current version is good enough to be implemented in real life to be used.

Head of the Department Department of Electronics and Communication Enge Vidya Jyothi Institute of Technology, Hyderahad-500075

# REFERENCES

[1] Vikas Yadav, G. P. Bhole, "Cloud Based Smart Attendance System for Educational Institutions." international conference on Machine Learning, Big Data, Cloud and Parallel Computing. Year of publication (2019)

[2] Fahad-Bin-Mazhar, Oli Ahamed, Md. Rasedujjaman, "Biometric Smart Attendance Kit with Fingerprint Scanner by Using Microcontroller", 1st International Conference on Electrical and Electronic Engineering.

[3] Mohamed Basheer K P Raghu C V, "Fingerprint Attendance System for classroom needs". year of publication (2013).

[4] Tarun Sharma, Mrs. S. L. Aarthy, "An Automatic Attendance Monitoring System using RFID and IOT using Cloud". International Conference on Green Engineering and Technologies. year of publication (2016)

[5] Mohd Helmy Abd Wahab, Ariffin Abdul Mutalib, Herdawatie Abdul Kadir, Mohamad Farhan Mohamad Mohsin, "Design and Development of Portable RFID for Attendance System", year of publication (2010)

[6] Nur Izzati Zainal, Khairul Azami Sidek, Teddy Surya Gunawan, Hasmah Mansor, and Mira Kartiwi, "Design and Development of Portable Classroom Attendance System. Based on Arduino and Fingerprint Biometric",

[7] P. Kovelan, N. Thisenthira, T. Kartheeswaran, "Automated Attendance Monitoring System Using IoT", International Conference on Advancements in Computing, year of publication (2019).

[8] Sebastian Chennattu, Aditya Kelkar, Aaron Anthony, Sushma Nagdeote, "Portable Biometric Attendance System Using IOT", 4th International Conference on Information Systems and computer Networks, year of publication (2019)

[9] Anilkumar Patil, Akash Mahla, Sonica Sonawane, "IoT based attendance system", International Research Journal of Engineering and Technology.

[10] Md. Abdul Kaium Khan, Towqir Ahmed Shaem, Mahbubur Rahman, Abdullah Zowad Khan & Mohammad Shah Alamgir, "A Portable and Less Time Consuming Wireless Biometric Attendance System for Academic Purpose Using NodeMCU Microcontroller", 21st International Conference of Computer and Information Technology, year of publication (2018)

31

-

[11] Piyush Devikar, Ajit Krishnamoorthy, Aditya Bhanage, Mohit Singh Chauhan, "IoT Based Biometric Attendance System", International Journal of Advanced Research in Computer and Communication Engineering, vol (5), Special issue (2),

[12] Chitresh Saraswat, Amit Kumar, "An Efficient Automatic Attendance System using Fingerprint Verification Technique",

[13] Gunjan Talaviya, Rahul Ramteke, A. K. Shete, "Wireless Fingerprint Based College Attendance System Using Zigbee Technology.", International Journal of Engineering and Advance Technology, vol (2), issue (3), year of publication (2013)

[14] K. Jaikumar, M. Santhosh Kumar, S. Rajkumar, A. Sakthivel, "FINGERPRINT BASED STUDENT ATTENDANCE SYSTEM WITH SMS ALERT TO PARENTS", International Journal of Research in Engineering and Technology, vol (4), issue (2), year of publication (2015)

[15] Gagandeep, Jatin Arora and Ravinder Kumar, "Biometric Fingerprint Attendance System: An Internet of Things Application".

[16] Zhang Yongqiang, LIU Ji, "The Design of Wireless Fingerprint Attendance System",

[17] Akindutire C.O, Adetunmbi A.O, Olabode O.O, Ibidunmoye E.O, "Fingerprint-Based Attendance Management System", Journal of Computer Sciences and Applications, vol no.1/issue no. 5/page no. 100-105/year of publication 2013

[18] J. Vinoth Kumar, K. Prasanna Kumar, K. Sreenadh, K. Sujith Kumar, "Biometric Attendance System Over IOT", International Journal of Research Publication and Reviews, vol (2), Issue (3) Page (494-497), year of publication (2021)

Head of the Department Communications and Communications Laga Department of Electronics and Communications