



# IOT BASED BIOMETRIC ATTENDANCE MONITORING SYSTEM

Miss Madhavi Devpunje<sup>1</sup>, Miss Shruti Raut<sup>2</sup>, Miss Sumati Vikhe<sup>3</sup>  
Vaishnavi Gupta<sup>4</sup>, Mr. Prashant Thak, Prof. Raut<sup>5</sup>

BE.Final year, Department of Electronics and Telecommunication,  
Government College of Engineering, Nagpur, India<sup>1,2,3,4</sup>

Assistant Professor, Department of Electronics and Telecommunication, Government College of Engineering,  
Nagpur, India<sup>5</sup>

**Abstract :** IOT based Biometric student attendance system increases the efficiency of the method of taking student attendance. This paper may be a study of IOT based biometric attendance monitoring system. in which we recognition student attendance using fingerprint sensor by using NodeMCU microcontroller. This paper presents an easy and portable approach to student attendance within the sort of an online of Things (IOT) based system which records the attendance using fingerprint sensor based biometric scanner and stores them securely over cloud using microcontroller. This paper also provides the design method of fingerprint-based student attendance with help of fingerprint sensor and NodeMCU microcontroller. This system ignores the requirement for stationary materials and manual work for keeping of records. The main and important objective of this project is to develop an embedded system which is used for record proper student attendance. The biometrics technology is rapidly progressing and offers attractive opportunities. In recent years, biometric authentication has grown in popularity as how of personal identification in college administration systems. The prominent biometric methods which will be used for authentication include fingerprint, palmprint, and handprint, face recognition, speech recognition, dental and eye biometrics. In this paper, a microcontroller based proto type of attendance system using fingerprint sensor module is implemented. The tracking module is employed here to spot the situation of the missing person.

**Keywords:** - Biometric, Fingerprint, IoT, Fingerprint Scanner, Attendance.

## 1. INTRODUCTION

Attendance plays a serious and important role in educational institutions and other institutes and industries. The most common method means of taking attendance within the classroom is by calling out the roll numbers of scholars or asking the every students to sing manually on the attendance sheet, which is passed around during the lecture. the method of manually taking and maintaining the attendance records becomes highly cumbersome. Biometric systems have reached a sufficiently advanced stage wherein they will record attendance without hampering portability. With the recent development of varied cloud-based computing and storage systems, data are often more securely stored and recover whenever required. Primarily, fingerprints and iris images are considered to be the foremost reliable to be used in biometric systems. A system that records the attendance with the use of biometric fingerprint scanner and stores them securely over cloud in the form of excel, Google Spreadsheet can help resolve issues. The system consists of a fingerprint scanner which is employed for ascertaining a student's identity. If the fingerprint scanned matches with records present within the database, attendance is granted to the scholar by updating to the Google Spreadsheet.

## 2. PROPOSED METHDOLOGY

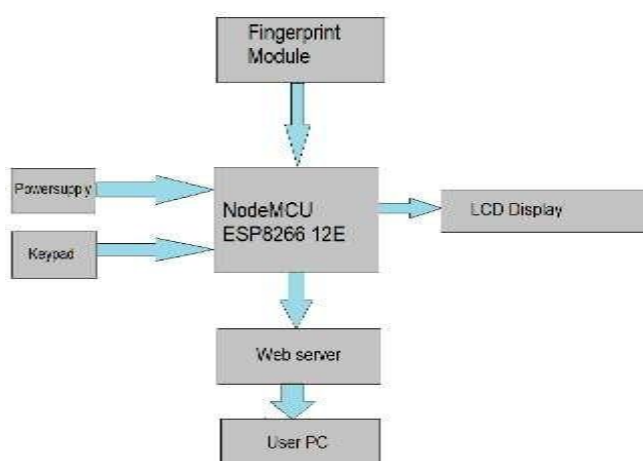
The fingerprints from the various users are acquitted using the fingerprint module. For example, we are taking the samples of three or four fingerprints and that they are enhanced using several enhancement techniques. After that we detect the sides along the image using the sting detection function. Here we use the pewit operator for the detecting the edges.



We use minutiae matching algorithm for matching the finger print images. Instead of doing all these image processing works, we had used Fingerprint Module in this paper. The circuit is made to be switched ON and every one the initialization processes are done.

The “Initialization done” message has got to be displayed in the screen. Up to that user should not keep any fingerprints for scanning. After that “Show the Finger” will be displayed on the screen. The fingerprint that has to be compared is already stored within the memory of fingerprint module. The fingerprint module is capable of storing about 100 images in the inbuilt memory. Now the fingerprints are kept for scanning with during a stipulated time period. Fingerprint module started to compare the results and it gives the hex codes to the microcontroller for further operations. The microcontroller starts to send the results from the finger print. But the microcontroller has just one transmitter pin in it. There are also commands for hold the fingerprints and for comparing it for correct result. The person whose fingerprint is matched and there'll not be any SMS send to those persons. The persons whose fingerprints were not kept were taken and SMS are going to be sent only to those numbers. If the fingerprint of an unknown person is kept for scanning then the scanning won't happen. If unknown persons fingerprint is kept on fingerprint sensor then the message “Not Identified” will be displayed.

### 3. HARDWARE IMPLEMENTATION AND WORKING



### 4. COMPONENT USED

**1. NodeMCU ESP8266:** NodeMCU may be a low-cost open source IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which was supported the ESP-12 module. Later, support for the ESP32 32-bit MCU was added. NodeMCU is an open source firmware for which open source prototyping board designs are available. The name "NodeMCU" combines "node" and "MCU" (microcontroller unit). The term "NodeMCU" properly speaking refers to the firmware instead of the associated development kits. [citation needed]

Both the firmware and prototyping board designs are open source.

The firmware uses the Lua scripting language. The firmware is predicated on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open-source projects, like lua-cjson and SPIFFS. Thanks to resource constraints, users got to select the modules relevant for his or her project and build a firmware tailored to their needs. Support for the 32-bit ESP32 has also been implemented.

#### 2 Fingerprint Recognition:

The fingerprint recognition or fingerprint authentication are going to be displayed. With the assistance of this the oldsters are often known about their arrival of the scholars to the school or school refers to the automated method of verifying a match between two human fingerprints. Fingerprints are one of many sorts of biometric used to identify individuals and verify their identity. If unknown person's fingerprint is kept then the message “Not Identified”.



### **5. ADVANTAGE**

1. Less Maintenance cost.
2. No extra manpower required.

### **6. APPLICATION**

Educational Sector

- Different industries such as workforce management
- It can be used for security purposes where high level security is desired.
- This system can be used for real time monitoring of any class strength and make attendance record in realtime

### **7. CONCLUSIONS**

The traditional process of manually taking and maintaining student attendance is highly inefficient and time consuming. The attendance monitoring system based on biometric authentication has a potential to streamline the whole process. An Internet of Things (IoT) based portable biometric attendance system can convince be of great value to educational institutions during this think of it proves to be highly efficient and secure. The cost involved in making this technique is sort of less, in comparison to conventional biometric attendance system. The use of cloud computing to store the attendance records makes all the data easy to access and retrieve as end when required by the teachers. The use of fingerprint scanner ensures the reliability of the attendance record. The system, due to its lack of complexity, proves to be easy to use and userfriendly

### **8. REFERENCES**

- [1] Murizah Kassim, Hasbullah Mazlan, Norliza Zaini, Muhammad KhidhirSalleh "Web-Based Student Attendance System using RFID Technology" IEEE International Conference on Vol. 4 Issue. 5, 2012.
- [2] Kamaraju M. & Kumar P.A, "Wireless Fingerprint Attendance Management System", IEEE International Conference on Electrical Computer and Communication Technologies (ICECCT), Vol. 3, Issue. 3, pp. 5-7 March, 2015.
- [3] Gutiérrez P.D., Lastra M., Herrera F. & Benítez J.M., "A High Performance Fingerprint Matching System for Large Databases Based on GPU", IEEE Transactions On Information Forensics And Security, Vol. 9, No. 1, pp. 62-71, 2014.
- [4] Zainal N.I., Sidek K.A., Gunawan T.S. & Martini H.M.M, "Design and development of portable classroom attendance system based on Arduino and fingerprint Biometric", IEEE International conference on information and communication Technology for the Muslim world, Nov. 17-18, 2014.
- [5] Benyo B., Sodor B., Doctor T. & Fordos G., "Student attendance monitoring at the university using NFC", IEEE Wireless Telecommunications Symposium (WTS), Vol. 3, Issue. 3, pp.187-198, April 18-20, 2012.
- [6] Ansari A.N., Navada A., Agarwal S., Patel S. & Sonkamble B. "Automation of Attendance system using