

Student Attendance System with Fingerprint Reader

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ABSTRACT

It focuses on researching biometric technologies and creating a system for student attendance that uses fingerprint recognition to confirm attendance. Students will be able to verify their attendance in every class by using the hardware that has been provided to scan their fingerprints as part of the upcoming attendance system. Simultaneously, a web-based attendance system will be created so that the instructor or administrator can view and evaluate student attendance by creating an attendance report. The primary goal is to provide a quicker, more accurate, and more efficient system to replace the existing traditional attendance system. It functions; a student's biometric identification is used to track attendance. Finger impression highlights are thought to be the fastest and most effective biometric identification method. A report on student attendance will be created, which the faculty can review and evaluate. Certain problems, like amigo marking and missing participation sheets, can be eliminated with this new finger impression acknowledgment participation framework. It can also regulate the understudy play hooky rate. Finally, the deployment of this system will undoubtedly offer a more accurate, dependable, and efficient means of managing the student attendance data.

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

I. INTRODUCTION

For any organization to operate effectively, regardless of whether it is a business or educational setting, accurate records of employee or student attendance must be kept. The main driving force behind this project is the creation of an effective attendance management system that will enable students to accurately and conveniently maintain their records. These days, attendance is recorded on paper, and records are kept by someone who keeps track of everything and performs all the computations at the end of the month. As a result, it takes time, and students must wait until the end of the month to find out their attendance. Because this system will eliminate the headaches associated with roll call and save teachers' and students' valuable time, attendance records will be more accurate.

This system applies the idea of IoT to a classroom's attendance record. A mobile module that can identify students by their fingerprints is created, and it can send the student's ID to a server that can identify the student's fingerprint. Initially, the system needs to be connected to the internet, which is possible with Wi-Fi. Therefore, a system with Wi-Fi connectivity is needed, and the Node mcu (ESP8266 12e) is selected for this purpose. The system now searches every Wi-Fi network when it turns on, and any network can be connected by providing the password. After establishing a connection, the fingerprint module r-305

is used to scan for the student's fingerprint and identify them. The fingerprint ID of the student who is identified is sent to the server (PC).

Upon receipt of the fingerprint ID by the server, the student's attendance is recorded. In essence, a server is a PC that keeps track of every attendance record and determines the attendance percentage. A student can verify their attendance in real time by visiting the website or using an Android application. With the current system, a teacher must take attendance by roll calling, which has several disadvantages. These include proxy attendance, additional work for the teacher to calculate the attendance percentage—calculation errors can occur—and the fact that students don't receive their attendance reports until the end of the month. By using this system, all of these issues can be avoided because it uses fingerprint recognition to identify students, prevents proxy attendance from being marked, sends attendance data in real time to a server, handles all computations on the server, and allows students to view their attendance in real time.

II. UNDERSTANDING INTERNET OF THINGS

After the dot-com boom, everyone's eyes are focused on the next big thing that will make them rich. Since the invention of the internet, the world

has changed forever. Investment experts and statisticians may have a lot to say, but one thing is certain: embedded technology and the internet will play a major role in the next major move that shapes this century. Put differently, the definition of the internet of things is currently attracting the attention of major players. When the physical environment around us becomes vibrant and begins to change, our actions, our methods, and our timing will never be the same. The Internet of Things (IoT) is here and is becoming an increasing topic of interest among technology giants and business communities. The hype is not baseless as there are enough evidences to support the success of “Internet of Things” in the coming years. According to a report by Gartner there will be 30% increase in the number of connected devices in 2016 as compared to 2015 with 6.4 billion IoT devices entering the realm of internet of things. The number is further expected to increase to 26 billion by 2020. So, one might simply ask “What is Internet of Things” and how it is going to impact our lives and career opportunities. There is a lot of complicated technology and terminologies at work in the IoT world but here I will try to keep things simple to explain the concept of Internet of Things easily network infrastructure

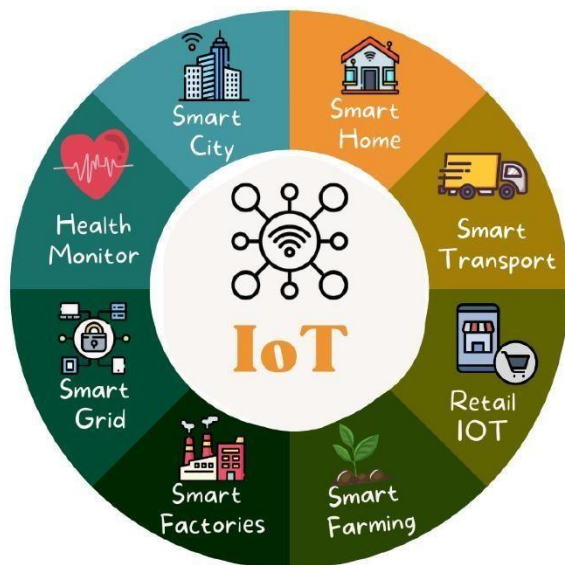


Fig: IOT

III. RELATED WORKS

The RFID based attendance system simplifies the process of taking attendance and reduces the paper

work and saves the lecture time. Student have to display their RFID card to the RFID reader in order to mark their attendance, and then the collected data will be sent to the professor’s cell phone via Bluetooth, in this way he/she can keep the record of attendance daily. The iris-based attendance system includes a small but very high-resolution camera for taking the image of the iris, which is then compared with the data enrolled in the database. If the entered data matches with the already existing data, the attendance of particular person is marked present. This system is costlier because of the highresolution camera, but communicating.

it’s the most fool proof system for the task, as the pattern and the colour of the iris is unique for every individual.

The wireless fingerprint attendance management is based on biometrics and wireless technique solves the problem of spurious attendance and the trouble of laying the corresponding network. It can make the users' attendances more easily and effectively. Enrolment of fingerprints is done on the Server using Digital Persona Fingerprint USB Sensor and verification is done on the client with the transmission of fingerprint template over the network. In this system attendance report is generated automatically and is further forwarded to faculty members via Email. In addition to this, SMS is also sent to parent’s mobile in case of short attendance of students

IV. COMPONENT SELECTION

Since a micro controller is needed for this system to work, the ESP8266 12e is selected. An OLED display is selected because a display is needed to show the names of the students whose fingerprints are scanned. In order to identify and scan the fingerprints, the R305 fingerprint module is selected. There is a 5-volt battery connected to power the system. Switches, cables, and PCB are additional parts that are needed.

This project's microcontroller is it. It was selected due to its extremely small form factor—24.75 x 14.5 mm. Additionally, it is Wi-Fi capable, enabling internet connectivity for Internet of Things applications.

V. FINGERPRINT SCANNER

To scan, a fingerprint scanner was needed. signing up and finding the fingerprints. R-305 is therefore selected since it has the capacity to store over 250 fingerprints. It operates on 5V and can capture images with a resolution of up to 500 dpi because of its strong image processing capabilities. Its measurements are 55*32*21.5 mm.

O-LED DISPLAY

A display is required to display the Wi-Fi networks and student names whose fingerprint matches. So, for displaying all the information an OLED Display is chosen. This system has a 0.96" OLED display which has resolution of 128*64.

VI. TO BE IMPLEMENTED

Algorithm

1. Starts the process.
2. Select the option to enroll new fingerprint or delete previous ones.
3. If nothing is selected it scans for the Wi-Fi network and joins if new known network.

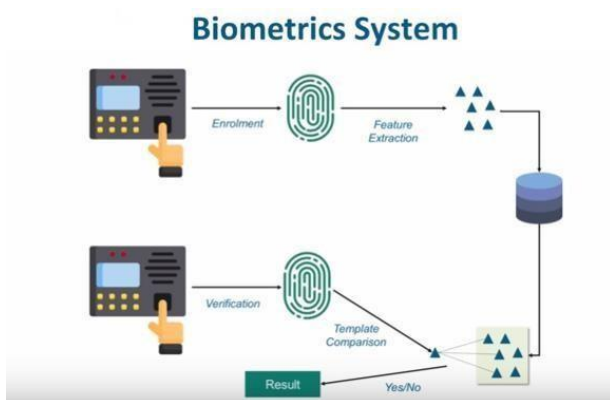


Fig: Architecture of fingerprint BAS using IOT

4. If none of the known networks are present than it displays all the available networks.

5. Any of the new network can be selected and joined by entering the password.
6. Once the connection is established it starts scanning for the fingerprints.
7. When a teacher scans his/her fingerprint it asks for the class and lecture for which attendance is being taken.
8. Now the students can scan their fingerprints.
9. Whenever it recognizes any student it send their fingerprint ID to the server through packet data transmission.
10. When a server receives the data from the system it updates the attendance of the student.
11. When the attendance of all the students is taken, any student can check his/her attendance on the android application.

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