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IOT BIOMETRIC ATTENDANCE SYSTEM USING NODEMCU

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ABSTRACT

In this project IoT Biometric Attendance Project, we will learn how to build IoT based Biometric Fingerprint Attendance System using NodeMCU ESP8266 12E, LED Display & R305 Fingerprint Sensor. The ESP8266 Wi-Fi Module will collect the fingerprint data from the multiple users and sends it over the internet to a website. The Enrolment of fingerprints is done on the Server using R305 or R307 or any other compatible Fingerprint Sensor and verification is done on the client with the transmission of fingerprint templates over the network

Keywords: NodeMcu, Push Button, Solenoid lock , 16*2 LCD Display , Ardunio Uno

I. INTRODUCTION

The In the World of Technology, Biometrics plays an effective role in identifying Human beings. Through this project, you will develop a unique system that can identify students for attendance purpose using their fingerprints.

In this project, we are going to design a Fingerprint Sensor Based Biometric Attendance System using Arduino. Simply we will be interfacing fingerprint sensor with Arduino, LCD Display & RTC Module to design the desired project. In this project, we used the fingerprint Module and Arduino to take and keep attendance data and records.

Biometric Attendance systems are commonly used systems to mark the presence in offices and schools. This project has a wide application in school, college, business organization, offices where marking of attendance is required accurately with time. By using the fingerprint sensor, the system will become more secure for the users.

II. METHODOLOGY

We use Fingerprint Sensor module to authenticate a true person or employee by taking their finger input in the system. Here we are using 4 push buttons to enroll, Delete, UP/Down. ENROLL and DEL key has triple features. ENROLL key is used for enrollment of a new person into the system. So when the user wants to enroll new finger then he/she need to press ENROLL key then LCD asks for the ID, where user want to be store the finger print image. Now if at this time user does not want to proceed further then he/she can press ENROLL key again to go back. This time ENROLL key behave as Back key, i.e. ENROLL key has both enrollment and back function. Besides enroll key is also used to download attendance data over serial monitor. Similarly, DEL/OK key also has the same double function like when user enrolls new finger, then he/she need to select finger ID by using another two key namely UP and DOWN. Now user need to press DEL/OK key (this time this key behave like OK) to proceed with selected ID. And Del key is used for reset or delete data from EEPROM of Arduino.

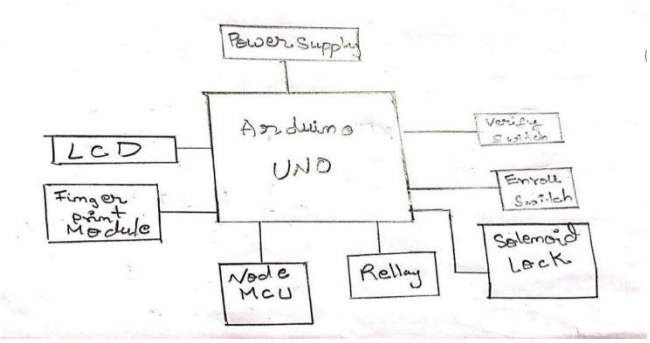

Figure 1: Block Representation

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Hardware Components Used:

1.Arduino Uno.

2.16*2LCD Display

3.WiFi Module ESP8266.

4.Push Button.

5.Solenoid Lock.

III. MODELING AND ANALYSIS

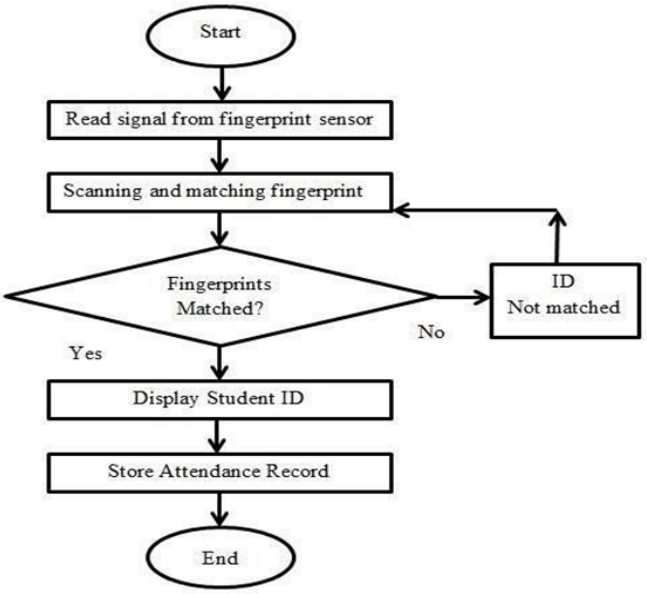

Figure 2: Flow Diagram

Biometric techniques can be used to solve these problems. Biometric is derived from two Greek roots "bios" meaning life and "metrics" meaning measurement. Biometric technology identifies a person uniquely based on his/her characteristics which can be physiological or behavioral. Among the various biometric techniques, there are nine main biometric techniques which are widely used. These include fingerprint, face, hand vein, hand geometry, iris, retinal pattern, voice print, signature, and facial thermo grams. Comparison of different biometric techniques has shown that fingerprint biometric is a reliable, mature and legally accepted biometric technique. Therefore, Fingerprint based attendance system can be used for identification of large number of students in universities and also for attendance monitoring of employees in organizations

IV. RESULTS AND DISCUSSION

Figure 3: Output in Monitor

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The experimental model was made following the circuit diagram and the desired results were obtained. Every time someone places his 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 .That's how the whole system works.

V. CONCLUSION

Here we have developed a Biometric fingerprint based attendance system using Arduino. In this project we have used R307 fingerprint sensor which reads the Fingerprint and stores in the form of digital data. A buzzer is activated and LED blinks then LCD panel shows that data is stored along with username, date and time. Working of this fingerprint attendance system project is fairly simple. First of all, the user needs to enroll fingerprints of the user with the help of push buttons. To do this, user need to press ENROLL key and then LCD asks for entering ID for the fingerprint to save it in memory by ID name.

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