

Fingerprint Attendance System using Arduino

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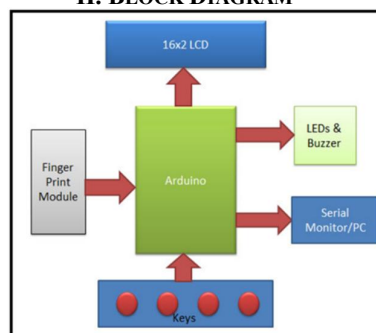
Abstract: Fingerprint attendance system aims to automate the attendance procedure of an educational institution using biometric technology. This will save time wasted on calling out names and it gives a fool-proof method of attendance marking. A hand-held device is used to mark the attendance without the intervention of 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. Therefore, this paper proposes an IOT based fingerprint attendance system considering time efficiency and user Satisfaction. Once the data has been inputted in machine, it will be directly recorded that the employee is coming Works or student is attending the class. The results of testing this system has a fingerprint identification accuracy, and the average time matching fingerprint sensor.

Keywords: Biometric Attendance, Classroom Project, IOT based Project, Smart Attendance System

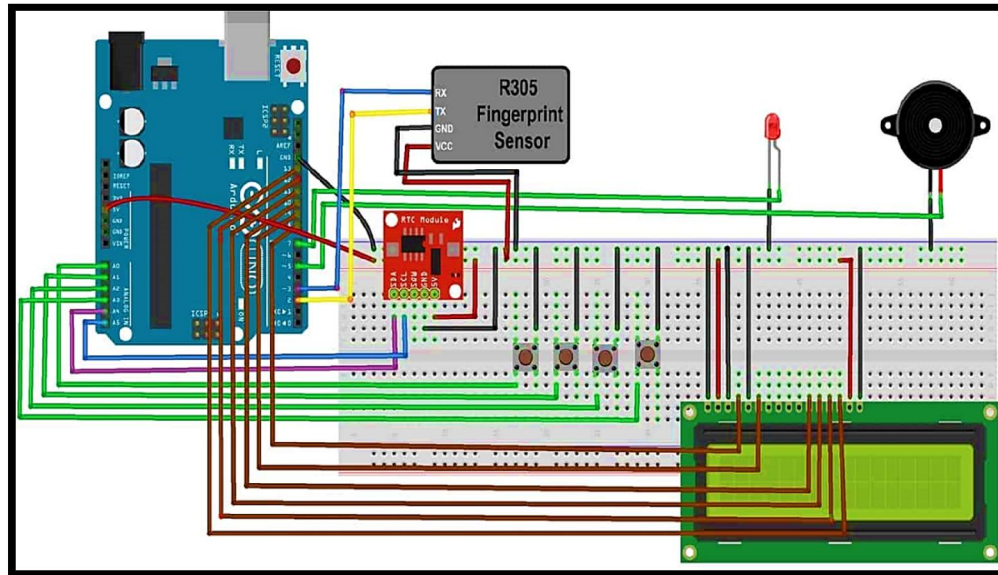
I. INTRODUCTION

It is expected today that an individual who wants to authenticate himself for a service must have a token and/or password for example identity card, ATM card, driving license, health card and so on. Carrying different cards and remembering passwords for different services is a significant issue for individuals and organizations. A secure and effective identity management system plays an important role in the successful deployment of an attendance management system. To make the identity management system more secure and reliable for authentication, biometrics data are integrated in the attendance management systems. Biometrics technologies verify identity through characteristics such as fingerprints, faces, irises, retinal patterns, palm prints, voice, hand-written signatures, and so on. These techniques, which use physical data, are receiving attention as a personal authentication method that is more convenient than conventional methods such as a password or ID cards because it uses data taken from measurements and such data is unique to the individual and remains so throughout one's lifetime. In these technologies, fingerprint becomes the most mature and popular biometrics technology used in automatic personal identification. The reason for the popularity of fingerprint verification is that fingerprints satisfy uniqueness, stability, permanency and easily taking. In this paper, an attempt was made to look at the prevalence in the 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, employees concerns over the levels of absence in their workforce and difficulty in managing student attendance during lecture periods. Sequel to this, a fingerprint-based Attendance Management System was developed to provide a faster, more secure, and more convenient method of user verification than passwords and tokens can provide for a reliable personal identification.

II. BLOCK DIAGRAM



III. CIRCUIT SCHEMATIC



IV. WORKING

The working of the Fingerprint Sensor Based Biometric Attendance System. In this project, we have used a DS3231 RTC Module for time & date display. We used 1 LED for power indication, 1 buzzer for different function indication. We have interfaced 16*2 LCD which displays everything whenever the finger is placed or removed, or registering attendance or downloading data. We have used 4 push buttons which are used to control the entire system. The functions of each button are:

1. **Register/Back Button:** Used for enrolling new fingerprint as well as reversing the back process or going back
2. **Delete/OK Button:** This Button is used for deleting the earlier stored fingerprint system as well as granting access as an OK selection.
3. **Forward Button:** Used for moving forward while selecting the memory location for storing or deleting fingerprints.
4. **Reverse Button:** Used for moving backward while selecting memory location for storing or deleting fingerprints.

4.1 Enrolling New Fingerprint

To enroll New Fingerprint Click on the Enroll button. Then select the memory location where you want to store your fingerprint using the UP/DOWN button. Then click on OK. Put your finger and remove your finger as the LCD instructs. Put your finger again. So finally your fingerprint gets stored.

4.2 Deleting Stored Fingerprint

To delete the fingerprint which is already clicked on DEL Button. Then select the memory location where your fingerprint was stored earlier using the UP/DOWN button. Then click on OK. So finally your fingerprint is deleted.

4.3 Downloading Data

Simply click on Register/Back Button and reset the button together. At this movement, the serial monitor should be opened.

V. ALGORITHM

- Step 1: Start
- Step 2: Connect fingerprint sensor to Arduino
- Step 3: Connect led display to Arduino

- Step 4: Read status of fingerprint sensor and show on lcd.
- Step 5: Press register/back button to add new fingerprint.
- Step 6: If status of register button is high, make fingerprint sensor high.
- Step 7: Else show error message on lcd.
- Step 8: If fingerprint sensor is high, make lcd high and ask to enter ID.
- Step 9: Else show error message on lcd.
- Step 10: If ID entered, ask to place finger on fingerprint sensor.
- Step 11: Else ask to enter ID.
- Step 12: If sensor scans finger, send data to Arduino UNO.
- Step 13: Else show error message on lcd.
- Step 14: If data is received successfully, scan fingerprint again.
- Step 15: Else repeat step 10.
- Step 16: If Fingerprint matched, Store fingerprint as given ID and ask to register new fingerprint.
- Step 17: Else show error message on lcd and repeat step 10.
- Step 18: If status of register button and Arduino reset button is high, start downloading data.
- Step 19: Else ask to add new fingerprint.
- Step 20: Stop.

VI. ADVANTAGES

1. High security and assurance.
2. User experience is convenient and fast.
3. Non-transferable
4. Near spoof-proof

VII. LIMITATIONS

1. Costly.
2. Stores upto 127 fingerprints only.

VIII. RESULT

In the model, as we have placed IR module on the back side of the bench. So basically, the working of this model is that, each bench has IR sensors with short range to detect the presence of students. Here the sensors are connected in such a way that when a student will come and sit it will detect the presence of the student and will send the signal to the hub connected to it. Here one thing is to be noticed that when the student enters into the classroom and he is just standing there then no appliances will be on till he goes near the bench where his presence will be detected by the sensor Now when students' presence is detected sensor will send this data to controller and there processing and further action will be taken.

IX. CONCLUSION

The developed system is an embedded system that is part of a fingerprint recognition/authentication system based on minutiae points. The system extract the local characteristic of a fingerprint which is minutiae points in template based. Templates are matched during both registration and verification processes. It reduces most of the administrative jobs and minimizes human errors, avoids proxy punching, eliminates time-related disputes and helps to update and maintain attendance records.

X. FUTURE SCOPE

Analysis confirmed that the biometric data can be set and confirm the identity of the user. Expanding the use of biometrics will enhance the ability to detect fraudulent issues in the presence of the students in class or employees in an organization. This system is user-friendly and very reliable. Therefore, it can be implemented either in organisations or educational institutions.

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