Fingerprint Based Biometric Attendance System

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***Abstract*—Attendance systems are commonly used systems to mark the presence in offices and schools. From manually marking the attendance in attendance registers to using high-tech applications and biometric systems, these systems have improved significantly. In our previous projects, we have covered few other electronic attendance system projects using Arduino microcontroller. In this project, we were planning to use the fingerprint Module and Arduino to take and keep attendance data and records. But due to limitation of current situation we are going to use the keypad instead of the fingerprint sensor. Because the fingerprint sensor's work may not be shown during the simulation as it works with real time fingerprint data. By using keypad, the system will be able to take Student ID from the student and match it with the server and take the attendance. Here are some components we are going to use to make this project in Proteus,**

Keywords— Fingerprint sensor, Arduino, microprocessor, microcontroller.

Introduction:

It is widely accepted that a proper attendance management system is crucial for any kind of institution. Since there are a lot of practical issues involved in paper-based manual attendance methods, nowadays almost all companies have automated their process of attendance management.

Throughout the article, we will show you how to build our own attendance management system using Arduino, fingerprint sensor & SD card module

And it is surprisingly easy to build this in less time for an affordable budget. Moreover, this will be a very useful product that we can use in our daily life.

LITURATURE REVIEW:

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. Manually attendance now in this era of modern life style doesn't suits that much. Everything is now developing so fast that our education system and other old system must be in changed. Attendance taking hand in hand should be changed. Paper based attendance method is used by most of the educational institutions and government organizations in developing. As the world is focusing on automatic works so this should be updated like biometric attendance system and this makes uniqueness, secured and environment friendly. For long time used like identity, management controlling access and unethical issues etc. For these reasons this technology is now popular and widely used.[1]It consists of two processes, those are - enrolment and authentication. In enrolment, the fingerprint is captured and finds the identity. 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 located of each ridge pixel using a 3 x 3 window. On the other hand authentication, the fingerprint of the user is captured again and compares with the database to determine a match before attendance is made. Moreover, the result shows a well secured and reliable system capable of preventing impersonation.[2]. The efficiency in the procedure of getting students attendance can be maximized when the IOT Based Biometric attendance system. The student's data are loaded securely over the cloud and can be easily fetched according to the need.[3] The system removes the proxy attendance. Phishing can be described as a social engineering. For the fraud identity the use of this technology can give a good output.[4]

METHODOLOGY & COMPONENTS

1. Arduino Board Uno

2. Keypad

3. Virtual Terminal (proteus)

4. Connecting Wires

5. Bread Board

6. DS1307 RTC module

Fig- Arduino Board Uno

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, and turn it into an output - activating a motor, turning on an LED, publishing something online. Anyone can tell to board what to do by sending a set of instructions to the microcontroller on the board.

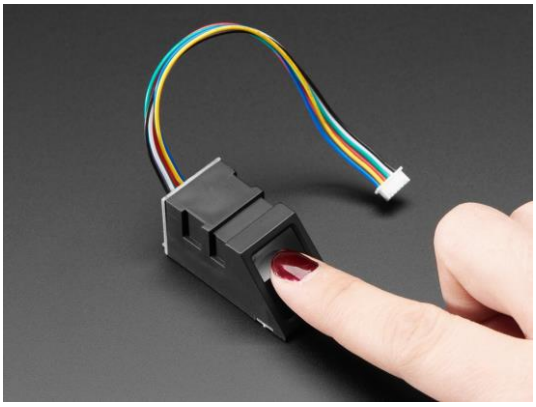

Fig- Fingerprint sensor

Fingerprint scanner is a type of electronic security system that uses fingerprints for different kinds of biometric authentication. This module is used in safes. A high powered DSP chip that does the image rendering, calculation, feature-finding and searching. Connect to any microcontroller or system with TTL serial, and send packets of data to take photos, detect prints, hash and search. It can also enroll new fingers directly - up to 162 finger prints can be stored in the onboard FLASH memory.

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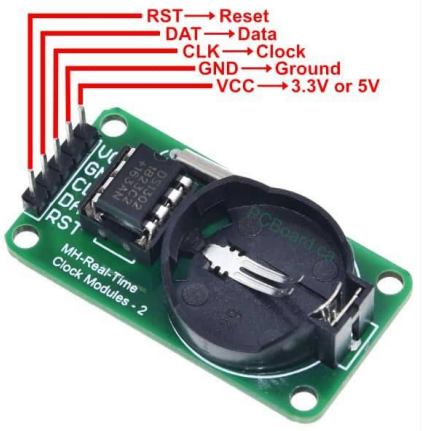

Fig- Real-Time clock module

Real time clocks (RTC), as the name recommends are clock modules. (RTC) IC is an 8 pin device and this device uses I2C interface. This clock/calendar provides all kinds of time related data.

PROCEDURE

- Compile the code in Arduino IDE. Do not run it as it will show Error if the system is not connected with a real Arduino.
- After compiling the code save the program in a specific folder
- From sketch select “Export Compiled Binary”
- Open the proteus software and create the circuit.
- For showing the time the DS1307 RTE clock module is used here
- This module will integrate with pc’s time and tell the time in the system.
- To enter the student id the keypad has been used here.
- To enter the ID the user have to press the ‘*’ button
- After pressing the button the user must enter their student id
- To save the id in the system the user have to press ‘#’
- After that the system will identify the user id and show the student name and give the attendance.
- The attendance time and date of each student will show under their name. By this the teacher will know if the student came on time or not.
- If any student from the outside wants to enter the class the system will identify them as wrong student id. As their id is not in the record for the respective course.

FUTURE WORKS

In biometric this attendance management system can be used by wireless. As wire are costly and needs space, moreover risks are always there. So wireless can be a good option. More data and information can be gathered through the finger management system. Through this automatic system, time and manpower is reduced to the great extent.[5]

CONCLUSION

The experimental result shows that the developed system is highly efficient in the verification of users fingerprint with an accuracy level of 97.4%. The average execution time for the developed system was 4.29 seconds as against 18.48 seconds for the existing system. In this new era things are so fast now and the finger response and the identifying will be more accurate day by day. Time will also be saved and the reliability of student's attendance information is also maximized.

RFERENCE

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