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MOBILE ATTENDANCE USING BIOMETRIC FINGER PRINT

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ABSTRACT

The register based conventional attendance system for students in institution is time consuming and a laborious task for teachers so we have developed and deployed an intelligent system based on fingerprint scanner to replace the traditional attendance system which can acquire, and store and check the fingerprints of students and export the data in the form of their attendance record to a centralized database which is used by an Android application developed which helps the administration and the students to view their attendance in real time and the entire system is cheap and reliable.
KEYWORDS : *Arduino , Biometric Scanner , Intelligent System, Authentication.*

1 . INTRODUCTION

The generic way of taking attendance is the conventional method of roll calls with occasional proxies. The process tends to be very long. In many places attendance is recorded manually in attendance registers by calling out the names. This results in waste of time and human effort. Also there are many fraudulent issues that happen when we use a register. For example, in educational institution the teacher calls out the names of the student's one after the other and marks their presence. A solution to overcome these problems is by using a system that will record the attendance automatically. In this direction, this paper presents a biometric system that records the attendance automatically. Biometrics is a method of identifying a person based on physiological characteristics. These characteristics cannot be duplicated to access information. Biometric characteristics are discrete and unique like odor, fingerprints, iris, retina, voice and face geometry.

Here we implemented a method called fingerprint recognition. Because of the uniqueness fingerprints, there is a vital role in modern biometrics technologies. The fingerprint scanner acquires the prints from the fingertip and cross checks it with the image previously saved. A fingerprint is made of a series of 'ridges' and 'valleys' on the surface of the finger. It compares these patterns of 'ridges' and 'valleys'. If the two patterns matches, then the attendance is marked.

2 . LITERATURE SURVEY

In [1] author Siddharth Pandey proposes a fingerprint identification system to mark attendance. Here the author first stores the current student fingerprint features using ridges, arch, loops using feature extraction and stores it in the database. Then when students enter the classroom, they scan their thumb on the fingerprint scanner which in turn matches the data stored in the database and mark the matched student as present in attendance. The feature extraction again takes place during attendance marking and they are compared with that of those stored in database. When a match is found, the student is marked present for that lecture.

In [2] author D.Narendharsingh is organized as follows: Section I consists of Arduino and Section II deals with Raspberry Pi. Initially fingerprint of students should be stored in the server to recognize the student. For that we have to use enroll (E) button for enrolment. By pressing E, the fingerprint of a particular student is stored in the data. Like-wise we have to store all the fingerprints of the students. During the process of taking attendance, we need to press start button (ST) to start the process. A green LED is glowed to know the process is started or not. After the process starts, the student should press Identification (I) button before he keeps his/her finger for attendance. The process should continue till all the students complete their identification. If all the students completed their attendance the teacher should stop the process by pressing Stop (SP) button and it indicates with the red LED in the board. All the above process is done in raspberry Pi board except the

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fingerprint module. The fingerprint module is connected to Arduino and the serial communication is done through X-bee modules which is connected to both raspberry and Arduino.

In [3] the system uses an automatic attendance management technique that integrates fingerprint authentication into the process of attendance management. It comprises of two processes namely; enrolment and authentication. During enrolment, the biometrics of the person is captured and is stored in a flash memory along with the person's id. The objective of the enrolment module is to register the user using his/her id and fingerprints into a flash memory after feature extraction. During authentication, the biometrics of the user is captured and are compared with all those that already exists in the flash memory to determine a match. If a match is found, then attendance is marked against the person's id. The flash memory comprises of fingerprint template and other details of the person.

In [4] The application will be installed on the professor's phone as well as student's phone which runs android OS. It intends to provide an interface to the professor who will require minimal details to input for marking of attendance of a particular class of students. Apart from that, the application would support strong user authentication and quick transmission of data. Another noticeable feature of the entire application is to give options to the user such as feedback provision, attendance retrieval in a very convenient way, messaging between user and professor and campus notifications like low attendance reminder, lecture amendments to name a few. The application thus build would also help to avoid the chance of a proxy as the system has biometric scanning which will serve the purpose of authentication.

In [5] Android Based Attendance Recording System to develop an android application which consists of the following dynamic features:

- Time saving as attendance can be taken just by counting total number of students.
- No need to maintain several separate records and manual calculations.
- More secured than traditional attendance system.

The main purpose of the user module is to provide security. This module is specially designed for staffs, which use mobile phone to take attendance. Each staff enter their username and password before enter into application and also able to access/retrieve attendance of student. The main purpose of this module is to capture the list/data of present students in class using mobile phone of each student. The main purpose of this module is to match/authenticate the finger print of student on their mobile phone and allow them to marked their attendance only after fingerprint authentication on their android mobile phone which fingerprint enabled mobile phone and stored in the data base of android mobile phone of teacher, and then it will be sent to server database. The first function of this msodule is to update the attendance list from the cell phone. When the attendance list from cell phone receives, server automatically updates its database and students or parent can view attendance through web server.

3 . EXISTING SYSTEM

The system is designed to store user's fingerprints, User ID and their Attendance data during student enrolment to the institution. The student can now use his/her finger on the fingerprint scanner to mark himself "Present" in the class and immediately his attendance will be stored in the Database. If the subject wishes to check the status or any information about his attendance, he/she can use the Dedicated "Android Application" developed for the Fingerprint Based Attendance System and see his attendance status in real-time. The fingerprint recognition sensor scans the finger tips and extracts the fingerprint and it' is processed with an Advanced Digital Image Processor(ADIP). Each ID is associated with a fingerprint and stored in a database. The Arduino Mega coordinates with the sensor to perform this enrolment operation. In the next stage, the attendance is calculated when the enrolled user places his finger on the sensor. This attendance is now updated in the database. The 16X2 LCD is interfaced to the Arduino Mega displays if the User's Fingerprint was identified successfully and displays a message saying "User_ID Is Found" & "User_ID Is Present ". The dedicated Android Application now captures this data in real time from the database and uploads it to the application and helps the user track the attendance.

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4 . PROPOSED SYSTEM

We have proposed a fingerprint based attendance system using biometric fingerprint technic. In which, the admin have create his/her own account to login to the system. The admin has to store all data of each student. In this model we have four modules.

4.1 Admin Account Creation
4.2 Insert Student Details
4.3 Attendance Marking Process
4.4 Attendance Verification

4.1 Admin Account Creation

If admin wants to login to the system, he/she has to create his/her account first. He/she needs to insert details like name, id no, email id, phone no, password, address etc…Thus it mentioned below in Fig.1.

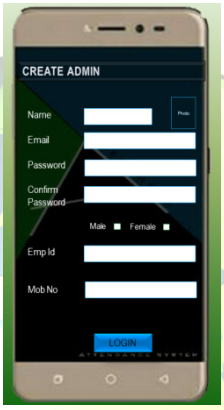

Fig.1 Admin account creation

4.2 Insert Student Details

In this module, the student details are adding to into the database for future enroll.
In which, the student`s fingerprint has to store to the database by using the biometric fingerprint scanner. The Fig.2 represents the student detail insertion process.

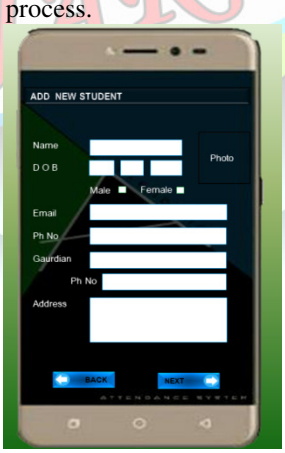

Fig.2 Insert Student Details

4.3 Attendance Marking Process

Attendance marking process is the main module in this application. This module is for marking attendance of the student using their finger print.

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Once the admin login to the application, then the platform is ready for the admin to mark the attendance, according to their class or semester. Then by using the biometric finger print scanner admin can mark attendance of student who all are present.The below Fig.3 represents the process of attendance marking.

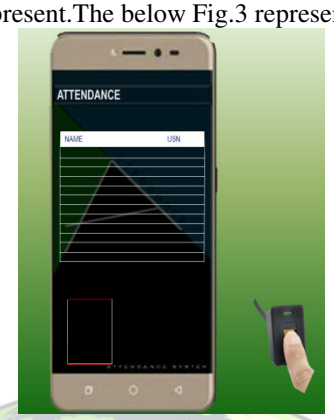

Fig.3 Attendance Marking Process

According to the student who all are scanning their finger print the application will recollect their information and mark it as present. This process will take several seconds. Once the admin logout from this page, all other students who is not done the scanning process will automatically mark it as absent. This is a background process. This is an one time process, that means not even admin cannot do any alter in the attendance further.

4.4 Attendance Verification

The main view of this module is to check the attendance percentage of all the students and can be done at any time. If admin wants to check the attendance details of any particular student, select the specific student name then it will show whole details of that student including name, usn, attendance percentage upto that day etc…

There is an option in this module to send the attendance details of the particular student to specific email address can be parent/guardian.

5 . SYSTEM DESIGN

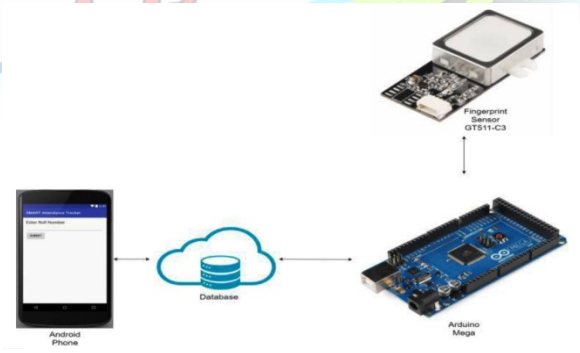

Fig.4 Architecture Design

The above Fig.4 represents the Architecture design, consists of a Smartphone with android OS, Arduino Microcontroller, Biometric fingerprint scanner and the Database, As soon as entering to the application the admin or user has to create his/her account first. Then, only he/she can login to the system. Application developed for the fingerprint based attendance system and see his attendance status in real-time. The fingerprint recognition sensor scans the finger tips and extracts the fingerprint and it' is processed with an Advanced Digital Image Processor. Each ID is associated with a fingerprint and stored in a database. The Arduino Mega coordinates with the sensor to perform this enrolment operation. In the next stage, the attendance is calculated

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6 . FLOWCHART

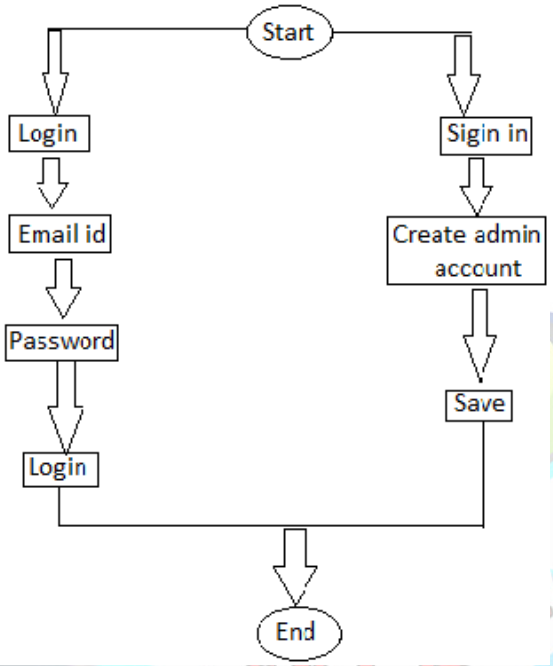

Fig.5 Log in page

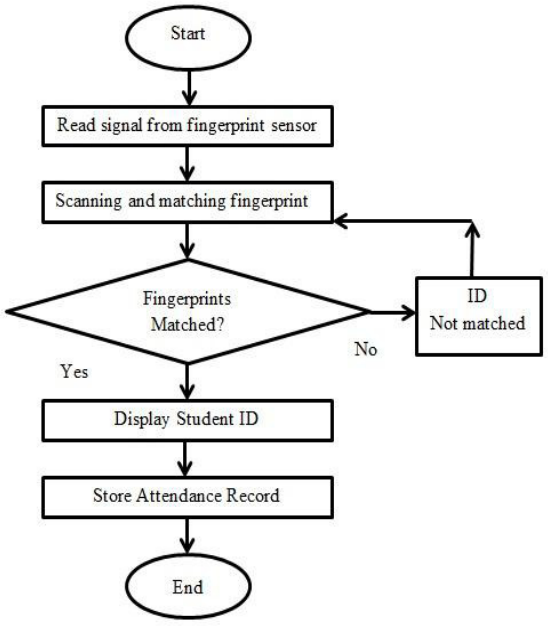

Fig.6 Flow diagram of finger print scanning

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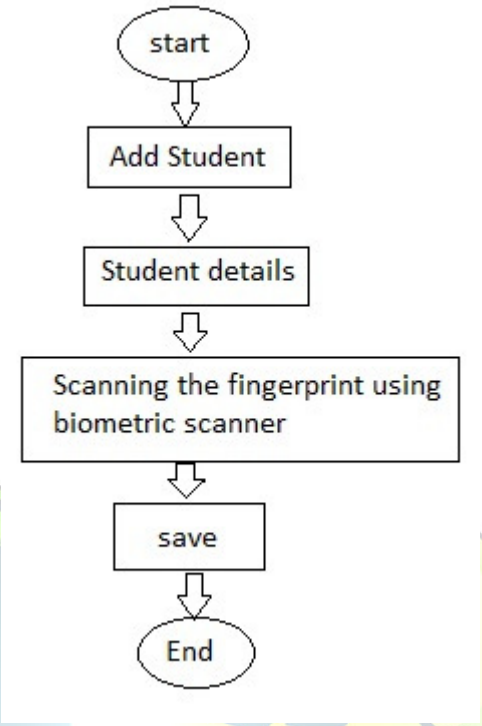

Fig.7 Insert Student Details

7 . CONCLUSION

Biometrics has been used at workplaces and many other areas for over a decade for attendance management. These concerns no longer persist once the historical proof of biometrics is noticed. Biometrics enables us to quickly authenticate our identity without the need of having to remember passwords or carry any form of identity proof. We can audit the attendance of students in real time using our proposed system. Through years of iterations it was noticed that when properly deployed, biometrics are an effective tool to track attendance in a secure and quick manner. This system offers a cheap yet reliable and efficient solution to the conventional attendance tracking systems.

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