

Student Attendance Monitoring System using Fingerprint Recognition

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Abstract— Our paper aims at designing a “Student Attendance Monitoring System Using Fingerprint Recognition” which could effectively manage attendance of scholars at the institute. Attendance is marked after student identification. For student identification, a fingerprint recognition based identification system is employed. Fingerprints are considered to be the most effective and fastest method for biometric identification. They’re secure to use, unique for each person and don’t change in one’s lifetime. Fingerprint recognition could be a mature field today, but still identifying individuals from a collection of enrolled fingerprints could be a time taking process. It absolutely was our responsibility to enhance the fingerprint identification system for implementation on large databases. During this project, many new algorithms are used. Using this algorithm, we’ve developed an identification system which is quicker in implementation than the other available today within the market. Although we are using fingerprint identification systems for student identification purposes in our project, the matching results are so good that it could perform okay on large database. Nowadays accurate personal identification is becoming more and more important. Usual means smart cards, password etc. have shown their limits. Currently fingerprint recognition is that the most generally used technique for private identification. The use of ink and paper to induce a picture from a finger was used for an extended time, but technological advances have enabled to automate the acquisition stage by means of fingerprint identification system. The proposed automated attendance system supported finger recognition was tested on class of student fingerprint database and achieved significant results for taking an attendance of the code of the department of computer engineering.

Keywords: Attendance System, Biometric Feature, Fingerprint Recognition, Identification, Verification, Scanner, Database

I. INTRODUCTION

The present is that the revolutionary time of technology. Most of the work depends on computer applications. The normal student attendance includes all the hassles of roll calling and each time consumes the scholar yet as teachers for conducting the classes within the department. The method is boring and really time-consuming for the scholars yet as teachers. So, a replacement approach is going to be needed to handle this process the present is that the revolutionary time of technology. Most of the work depends on computer application. The normal student attendance includes all the hassles of roll calling and each time consumes the scholar yet as teachers for conducting the classes within the department. The method is boring and really time-consuming for the scholar yet as teachers. So, a replacement approach is going to be needed to handle this process. “Student attendance monitoring system using

fingerprint recognition” is going to be accurate and save valuable time for college kids yet as teachers for conducting the classes.

II. BRIEF DESCRIPTION

Fingerprint Identification and Verification Student Identification should be done by students fingerprint. For identification, the device scans the ridge and fringe of the finger and creates a template. The system searches all the templates that are stored within the system database and matches with each saved template. If the templates match with the prevailing template then all the info of identified students are displayed within the dashboard, as shown in. But if the template isn’t matched with any existing template then the system notifies that the user is not the valid student of the department. The teacher can take the scholar attendances through the fingerprint of the scholar by using the fingerprint verification process. The teacher can login the system by his/her username password or by fingerprint. The assigned courses appear in his/her profile, as shown in. Then the teacher can take attendance to each class both by manually or through fingerprint. Teachers can take attendance through the fingerprint of the scholar. The strategy was done by fingerprint verification. The verify students attendances were stored within the attendance database. They’ll also take attendance manually by clicking the checkbox from the list of students. Finally, the scholar attendance report was generated from the attendance table. Two styles of reports are available here. One may be a detailed report that contains the date by date attendance, total attended, total absent, percentage and also the marks. The short report doesn’t contain the date by date attendance.

III. FINGERPRINT RECOGNITION

Fingerprints are considered to be the best and fastest method for Biometric identification. They are secure to use, unique for every Person and do not change in one’s lifetime. Automated fingerprint identification is the process of automatically matching one or many unknown fingerprints against a database of known and unknown prints. Automated fingerprint verification is a closely related technique used in applications such as attendance and access control systems [1]. Two majorly used algorithms are Pattern-based (or image-based) algorithms and Minutia Feature extraction-based algorithms [12]. Pattern based algorithms compare the basic fingerprint patterns (arch, whorl, and loop) between a previously stored template and a candidate fingerprint.

IV. METHODOLOGY

The present is that the revolutionary time of engineering. Most of the works depends on computer application. The traditional student attendance includes all the hassles of roll

calling and intensely time consume of the scholar furthermore as teachers for conducting the classes within the department. The strategy boring and intensely time-consume of the scholar furthermore as teachers. So, a replacement approach is visiting be needed to handle this process. This motivates us to style a reliable system for student attendance. The identification system is widely used for unique identification of humans, like students, mainly for verification and identification. Also, the employment of biometric feature in student attendance system is secure approach. A biometric system is either an ‘identification’ system or a ‘verification’ (authentication) system. Several biometric features are used for user verification. These are DNA matching (Chemical Biometric) [10], Ear (Visual Biometric), fingerprint recognition (visual biometric) [5], etc.

The methodological steps of the system are pictures by the block diagrams and shown in Figure-. The proposed system has the following five major components.

- a) User and Device Interface
- b) Data Acquisition with Fingerprints
- c) Fingerprint Processing
- d) Fingerprint Verification
- e) Attendance Report Generation

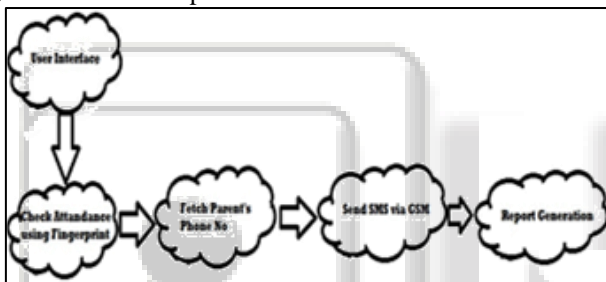


Fig. 1: Methodological process

A. User Interface

Teacher can add a student’s information, can add course, can assign courses to the teacher, can see the student attendance report and can view the all student’s information at any time. The user interface also includes to get student and teacher information. All the information about the student and teacher are taken through these stages.

B. Check Attendance using Fingerprint

The teacher can login the system by fingerprint. The assigned courses are appeared in his/her profile. Then the teacher can take attendance to each class through fingerprint. Teacher can take attendance through the fingerprint of the student. The process was done by fingerprint verification. The verified students’ attendances were stored in the attendance database.

C. Fetch Parent’s Phone No

The student can put fingerprint in the fingerprint sensor. If the student is verifying the personal information, then give phone number of the student in student database. Student phone number verify by teacher at a time.

D. Send SMS via GSM

The concept of sending message in his/her parent mobile by using hardware GSM module. The teacher can take

attendance of student those who student is absent in lecture then it goes message to his/her parent mobile phone number.

E. Report Generation

Finally, the system generates report of the student who is present or absent in the lecture or practical and also name of teacher who take a lecture or practical.

V. WORKING

User Interface is that the communication between a user and therefore the system. Within the proposed system there are two panels. One is for the Teacher, one is for the Student. Teacher should login the system. Teacher provides the fingerprint to fingerprint system.

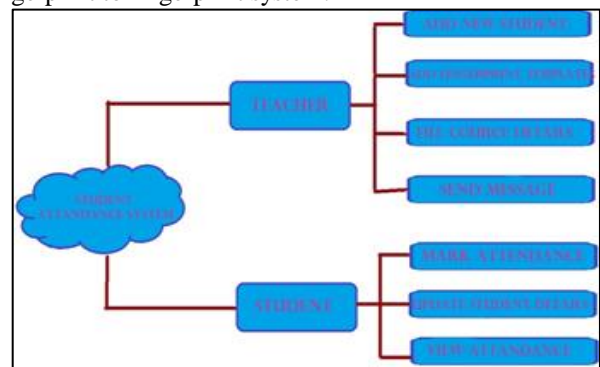


Fig. 2: Working Model

When a student enrolls his finger on the device’s scanner sensor, the device scans the sting and ridge of the finger. Finally, from now of fingers ridge and edge the device create binary template that’s mentioned as fingerprint template. The proposed system used these templates within the further steps, like identification and verification.

Fingerprint Identification and Verification of the student it should be done by students’ fingerprint. The system searches all the templates that are stored within the system database and matches with each saved template. The teacher can take the student attendances through the fingerprint of the student by using fingerprint verification process.

Finally, the student attendance report was generated from the attendance table. Detail of the report that contains total attendance, total absence. The short report that contains the date by date attendance.

We using main hardware component:

A. Arduino NANO

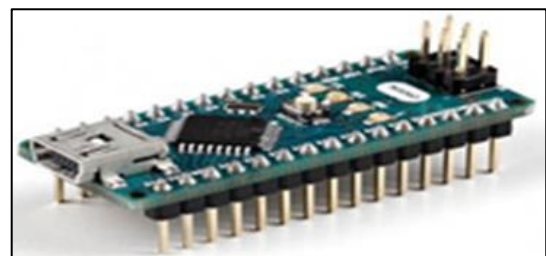


Fig. 3: Arduino NANO

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328P (Arduino Nano 3.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks

only a DC power jack, and works with a Mini-B USB cable instead of a standard one.

B. Fingerprint Sensor



Fig. 4: Fingerprint Sensor

These modules come with FLASH memory to store the fingerprints and work with any microcontroller or system with TTL serial. These modules can be added to security systems, door lock, time attendance system, and much more.

C. GSM Module



Fig. 5: GSM Module

GSM GPRS Modules are one of the commonly used communication modules in embedded systems. A GSM GPRS Module is used to enable communication between a microcontroller (and a microprocessor) and the GSM / GPRS Network. Here, GSM stands for Global System for Mobile Communication and GPRS stands for General Packet Radio Service.

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COM5
|
|
Adafruit Fingerprint sensor enrollment
Found fingerprint sensor!
Enter 1: Enrollment 2:Check Attendance 3: Delete enroll 4: Add Teacher 5: Fill Course Details
Ready to enroll a fingerprint!
Please type in the Roll No # (from 1 to 47) you want to save this finger as...
Enter Name:
Enrolling Roll No and Name2
Rutvik
Waiting for valid finger to enroll as #2
.
.
.
.
.
.
Image taken
Image converted
Remove finger
ID 2
Place same finger again
Image taken
Image converted
Creating model for #2
Prints matched!
ID 2
Stored!
10
    
```

Fig. 6: Output (1)

```

COM5
|
|
Adafruit Fingerprint sensor enrollment
Found fingerprint sensor!
Enter 1: Enrollment 2:Check Attendance 3: Delete enroll 4: Add Teacher 5: Fill Course Details
Ready to enroll a fingerprint!
Please type in the Roll No # (from 1 to 47) you want to save this finger as...
Enter Name:
Enrolling Roll No and Name2
Rutvik
Waiting for valid finger to enroll as #2
.
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.
Image taken
Image converted
Remove finger
ID 2
Place same finger again
Image taken
Image converted
Creating model for #2
Prints matched!
ID 2
Stored!
10
    
```

Fig. 7: Output (2)

VI. CONCLUSION

This paper summarizes Biometric representations of our data stored in database using biometric security. The active biometric learning module developed can be easily adapted and effectively used by the common peoples and which in terms also saves the environment through less use of paper. To survive in such a hack-able and fraud environment we need a strong security mechanism to secure our personal data which is only possible through biometrics which is unique identification of individual (even in case of twins).

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