

# Fingerprint Based Attendance Monitoring System Using Android Application

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**Abstract**— In most higher education institutions and universities in India, a minimum attendance criteria is applicable to all the students and the teacher manually records the attendance of the students present in the class. Existing attendance system has been managed through registers where teachers mark attendance of students manually. This system has some drawbacks, one of them is the long queues in front of the attendance machine at the time to enter and leave, the second possibility is of cheating, students can mark proxy attendance. This also wastes valuable time and energy of teacher to maintain record. There are various ways to automate the process of taking attendance such as fingerprint recognition, identity card scanner, Bluetooth sensors, and bar code readers for identity cards and so on. In this paper, we are proposing an attendance monitoring and record system based on finger print technology and a smartphone with android application. It will eliminate all the drawbacks of the present system. The application is used to collect the student data from the fingerprint module and store it. This provides a way for the teacher to instantly record and analyze the attendance and performance of all the students and helps in keeping record of attendance.

## I. INTRODUCTION

In current scenario, management and maintenance of student information is cumbersome task for any institution when the strength of students is more. Traditionally, attendance has been managed through registers where teachers mark the students attendance based on their presence. However, the supervision of such system is time consuming for scrutinizing the attendance data to trace out the students having shortage of attendance, listing total number of students present in the class and also liable to proxy entries by the students. The possible solution is to replace the manual entries in most of the existing systems by biometric based automated attendance systems.

Fingerprints play an important role in applications based on biometrics. Every person's fingerprint consists of unique pattern of ridges and valleys on the surface of the finger. As we go for paperless based system, we are proposing this system of attendance monitoring using fingerprint and smartphone. Fingerprint attendance machine is one type of biometric attendance machine that uses fingerprint detection methods to record student's attendance list. This type of fingerprint came into light and is used since 1997.

## II. GENERAL INSTRUCTIONS

### A. Basic Concept

The main objective of this system is to capture the genuine attendance with the help of digital verification of fingerprint and displaying their attendance record as well other academic details through Android application, also maintaining records of attendance such as monthly or semester wise as well as prepare reports and generate certificates.

### B. Propose System

In our proposed system, we improve the procedure of taking attendance and making easy to maintain records of each student. Every student record will be automatically updated

and generated after some lapse of given time. Details will be sent to their registered parents contact number.

### C. Android Application

This application runs on the android device which has 'admin' access through an internet connection. This application will takes the information about user, such as user's name, contact details, academic details, user's fingerprint, parent's contact details. Then the user's fingerprint will be matched with a database on the server and retrieve the date and time. With this method, it will improve the accuracy of the attendance system because it takes date and time in real time. The use of user identification by fingerprint method will also reduce fraud because the user cannot ask friends to mark attendance.

### D. Block Diagram

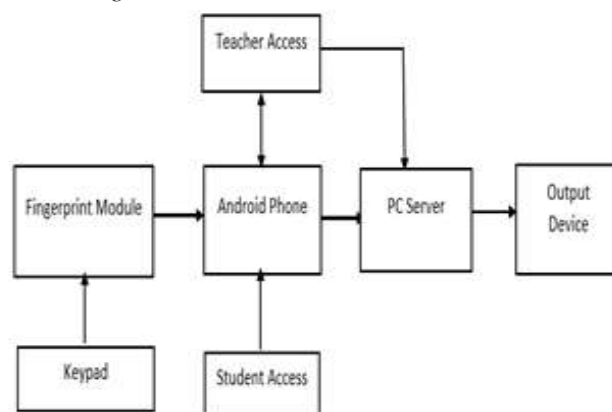


Fig. 1. Block diagram of the system.

### E. Block Diagram Description

Keypad is connected to fingerprint module and it is used to enter data such as name & roll number, while fingerprint module is use to scan the fingerprint of students. Then android

application created on mobile phone gives access to teacher which is readable/writeable. While student access is read only. When student scans the fingerprint, her information related to identity, attendance report and other information are displayed on the screen of phone. Later, data gets updated on server automatically and monthly report is generated. If a student has attendance below 75% then report will be sent to registered parent's mobile number. Also, the stored data can be used to generate Identity report whenever needed.

**Fingerprint Module:** Finger Chip IC for fingerprint image capture combines detection and data conversion circuitry in a single rectangular CMOS die. It captures the image of a fingerprint as the finger is swept vertically over the sensor window. It requires no external heat, light or radio source. Most reliable biometric for uniquely identifying an individual. In spite of some recent legal challenges in the USA, they are still regarded as giving proof of identity beyond reasonable doubt in almost all cases. The majority of the biometric-based security systems in operation today are based on fingerprint recognition.

### III. RESULTS

In this paper, we used Android Studio as platform to build a java code for attendance system to be run on android smartphone. We choose android smartphone because the number of android user is very huge in the world.

#### A. Attendance Application on Android Device

This application runs on the android device which has admin access and it is connected through internet. There are several menu on the main screen of applications, such as About Application and Login. Then there are two menu again which is main menu of application: Attendance & Schedule. When users want to use this application, then user has to register the device and give its information on the admin side. Student details such as name, academic year, email id, mobile number, parent's contact number will be stored in application.



Fig. 2. Image of student registration page.

Users must put his finger on a fingerprint sensor and press a button that sends the fingerprint scan results to the server, then server will check whether the device and fingerprint are already registered previously or not. After registration process

done, then user can do attendance process by scanning the finger on the fingerprint scanner.



Fig. 3. Fingerprint scanning successful.

#### B. Application for Admin

This application is created for admin who look after attendance management of students. Admin can add or remove student, create or edit information about student and they can keep check on their performance whenever they want. The layout of admin page is shown in below figure:



Fig. 4. Image of dashboard page.

This application menu consist of:

1. Manage Students: List of students is displayed here, admin can make changes if any.
2. View Attendance: Each student's attendance is displayed here. For each subject admin can maintain the attendance.
3. Profile: In this teacher's profile is registered. It will display the name of teacher, their respective subject and other details.
4. Active Attendance: This option will be activated when teacher will take the lecture. Teacher will press the active button and students present at that time will mark their attendance through fingerprint scanner and it will be updated here in this application.

#### C. Attendance Message Generated

This application generates a message after monitoring the attendance of each student every month. Message is sent by teacher to the parents who are in defaulters list or having attendance less than the mandatory attendance i.e.75%. Message format sent to parents contact number is shown below.



Fig. 5. Text message sent to parents contact number.

#### IV. CONCLUSION

Thus the developed system provides fingerprint acquisition module and attendance management module through android application. It performs functions such as information acquisition of fingerprint, processing, wireless transmission, fingerprint matching and attendance management. This attendance system can avoid long queue in front of attendance machine because the process of attendance monitoring

mentioned in this paper uses smartphone or other mobile devices. The problem of cheating can be reduced because we used fingerprint technology. In order to achieve the simple and real-time system, we proposed low-cost and high-performance wireless fingerprint attendance function. This low cost and easily mountable advanced fingerprint attendance monitoring system using wireless technology can be used in various industries, colleges, hospitals, government offices etc.

#### REFERENCES

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