

# Portable Biometric Attendance System using Raspberry Pi

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**Abstract:** *In the entire world, every educational organization is concerned about the attendance of individuals because this harms their overall performance. In the conventional method attendance of students is taken by calling out the names of students or signing on paper which is extremely time overwhelming. To eliminate this problem one of the solutions is a biometric-based attendance system that would be able to automatically capture the students' attendance by recognizing their fingerprints. Fingerprint recognition is regarded as one of the most reliable, accurate, and efficient biometric identification systems. The module enrolls the student's fingerprints. Enrolling is a one-time process. The fingerprints are stored in the fingerprint. At the same time, it is updated in a database. When the users log into the database, the data is sent through Wi-Fi to the server. The server maintains the records of the students. If the student's attendance goes below a certain percentage, an SMS will be sent to their registered mobile number. In many real-time applications, biometric authentication is used.*

**Keywords:** Biometric Attendance System.

## I. INTRODUCTION

Now-a-days people face many problems and fake identity is one of the core problems in the whole world. Moving towards the digital era biometric technologies have become more and more popular. Attendance is a concept that exists in different places like institutions, organizations, hospitals, etc. during every lecture to mark a person's presence. The way of taking attendance in a class includes a pen, an attendance sheet, and a person. Thus, the drawbacks arise as it consumes time, needs manual work and the most important, information or the attendance can be manipulated. The new procedure of taking attendance using fingerprint is easier and therefore overcomes all the above-mentioned drawbacks. A fingerprint is based on a biometric system that records the attendance automatically. This attendance system consists of a Raspberry-pi, the heart of the project and fingerprint sensor which is used to detect the person's identification.

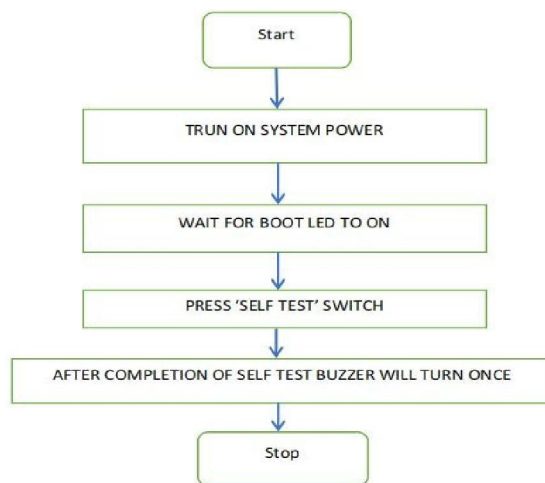
For example, in college or school, the student needs to place their finger on the fingerprint sensor to obtain their attendance. The fingerprint captured is recorded in flash memory. Each time it is checked whether the obtained fingerprint matches the record in the flash memory. place their finger on the fingerprint sensor to obtain their attendance. The fingerprint captured is recorded in flash memory. Each time it is checked whether the obtained fingerprint matches the record in the flash memory. By making use of this system, we overcome the problems such as proxy signatures and security risks by recognizing their fingerprints. Enrolling is a one-time process. The fingerprints are stored in the fingerprint sensor. The attendance of each student is displayed on LCD. At the same time, it is updated in a database. When the users log into the database, the data is sent through Wi-Fi to the server. The server maintains the records of the students. If the student's attendance goes below a certain percentage, an SMS will be sent to their registered mobile number. In many real-time applications, biometric authentication is used to eliminate proxy so no student can give attendance to their absent friends. The software platform used is Raspberry-pi (Linux OS), Python programming language.

## II. PROPOSED WORK

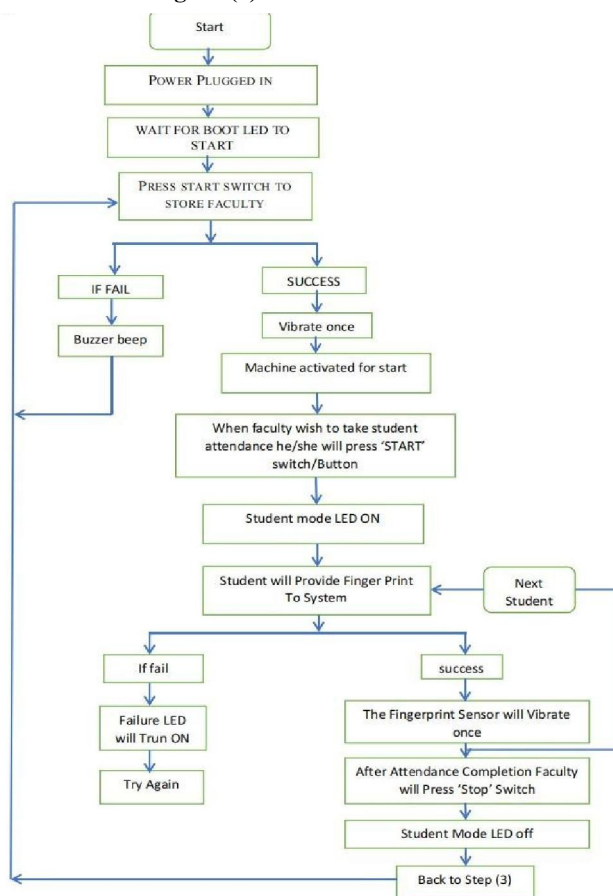
The system would comprise of two major elements via Raspberry Pi, module, and fingerprint sensor module. The module would enroll the student's fingerprints. Enrolling would be a one-time process. The fingerprint sensor stores the fingerprints. The vibrator will indicate the attendance of each student and at the same time, it is updated in a database. When the users log into the database, the data is sent through Wi-Fi to the cloud server. The server maintains the records of the students. If the student's attendance goes below a certain percentage, an SMS would be sent to their registered mobile number. This

System is capable of transmitting and receiving the data from the cloud. A user can easily get retrieval of data over an indefinite time.

In case a component or a module is not working in the proper manner system has a functionality switch which is the 'SELF TEST' switch by operating that key system will test its components and module and report it to the user by a specific indication.



**Figure (a): Self Test Flow**



**Figure (b): Flow Chart**

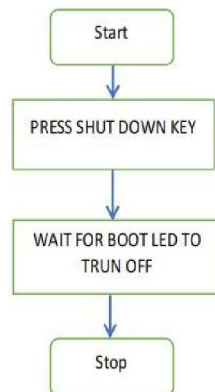


Figure (c): SHUTDOWN Flow

### III. LITERATURE SURVEY

For a beginning version of the attendance system is taking attendance through paper one class by one. This will lead to the cost of time, personal involvement and leads to confusion of the wrong attendance system. The enrolment of student fingerprints is another type of attendance system. Enrolling is one-time process. The students' fingerprints are stored in a fingerprint sensor. After the thumb impression, it will compare with the present fingerprint. Then attendance of each student is displayed and at the same time, it will be updated in the database. It will maintain student records. This process is working through the Wi-Fi server. If a student attendance percentage goes below they will get a message to their mobile through SMS. In the research of the attendance system, raspberry pi is utilized to build an economic biometric system. Raspberry pi is a compactable microcomputer with abilities of PC. By utilizing biometric technology, IoT based biometrics was used. The encrypted biometric information is stored on the cloud and the authentication is created through biometric services as host on cloud. But it does not give the printout automatically. RFID tag is an electronic tag. It is used to send the printer. RFID is based on the process of attendance system. This system does not take printout automatically. Our biometric sensor compares the digitized fingerprint and present fingerprint. And it will automatically send the document to the mail automatically to take printout. The attendance database will be stored on the server.

### IV. BLOCK DIAGRAM

Raspberry pi contains the segmentation of storage and Bluetooth module. It contains the digitized information of the fingerprint of a person. Biometrics sensor is used to digitize the information after thumbprinting on the sensor. Raspberry pi compares the thumbprint information with the present thumbprint. If the time is out for the attendance it is considered as late attendance or not accepting the thumbprint. After five minutes, the document will send to the authorized person's sms.

#### 4.1 Flow Chart

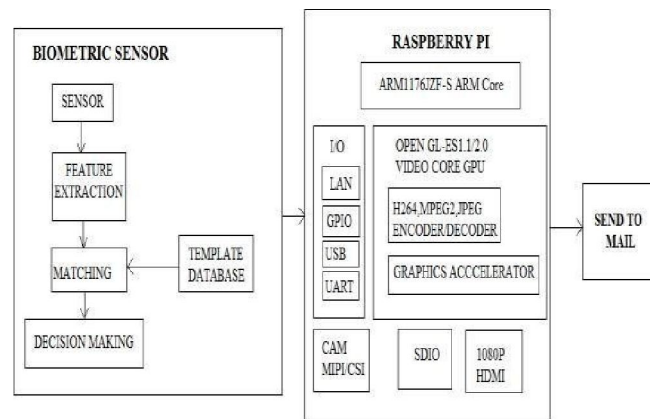


Figure (d): Block Diagram of Proposed System

The collected attendance information are sent to the most computer of the organization or cloud and that we can check it as email. The raspberry pi is that the microcontroller used which controllers the entire hardware component and python is employed because the software tool. Then after 5 minutes send the mail for authorized person

## V. CONCLUSION

This paper has successfully presented the design and development of portable attendance system which is based on fingerprint identification. The system would help to reduce many issues such as, avoiding the possibilities of marking fake attendance, helps to ease the lecturers to keep track of students' attendance, the encryption technique adds more security so there will be no anonymous fingerprint which will be able to hamper with the recorded data, and the portability saves time in taking attendance instead of queuing in a line.

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