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**INTERNATIONAL JOURNAL OF  
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/6898  
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/6898>



### RESEARCH ARTICLE

#### GSM AND BIOMETRIC BASED ATTENDANCE SYSTEM.

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#### Manuscript Info

##### Manuscript History

Received: 09 February 2018  
 Final Accepted: 11 March 2018  
 Published: April 2018

##### Keywords:-

GSM module, Biometric, Authenticates the user, SMS, eliminates the proxy

#### Abstract

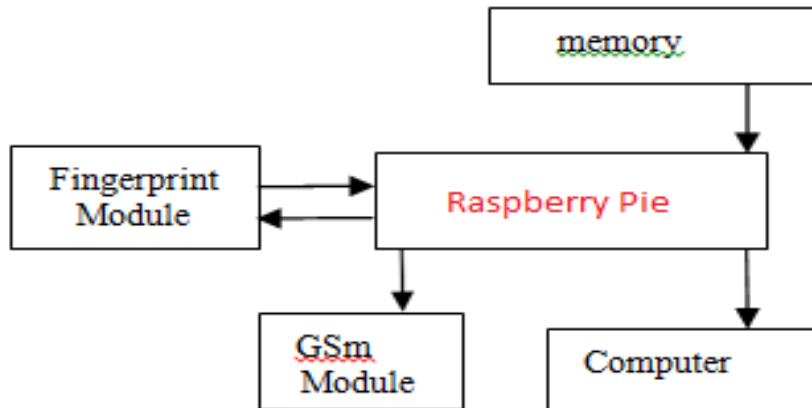
The project GSM and biometric based attendance system using raspberry pie is about enrolling attendance using fingerprint and broadcasting particular message to the registered mobile number using GSM module. This project takes as an input the fingerprint of a student and if the fingerprint matches it authenticates the user. We have also used the GSM module so as to inform the parents of the defaulter students through an SMS. This system is accurate as it takes the fingerprint of a student for marking the attendance and the fingerprint of each individual is unique. This not only improves the accuracy of the system but also eliminates the proxy as the student himself/ herself has to be present for the lectures for marking the attendance.

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#### Introduction:-

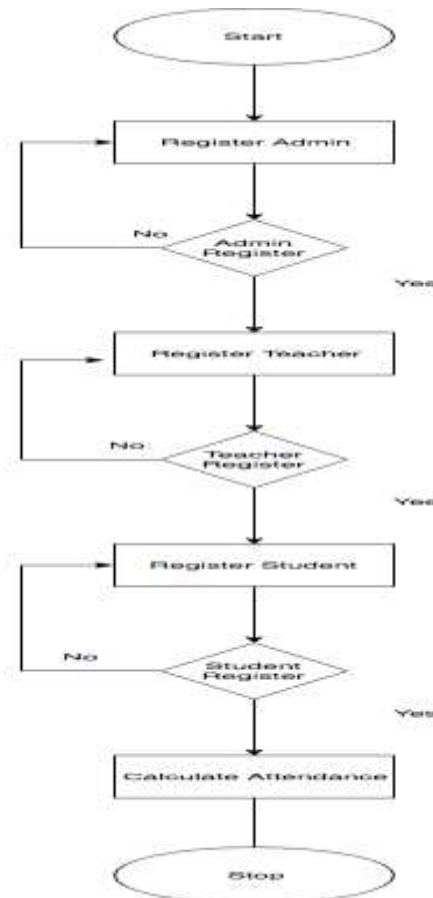
The system takes the attendance of students using biometric access and hence provides authenticity, accuracy and confidentiality. The register based conventional attendance system for the students in our educational institution is laborious, time consuming and kind of boring task for the educators. An intelligent system based on fingerprint scanner have been designed and implemented that supplanted the traditional mundane attendance system. The system can acquire, store, crosscheck the fingerprint of individuals and export the spreadsheet in a memory module. The entire procedures are supervised by a microcontroller. This smart attendance kit is portable, handy, cheap and reliable. The proposed system comprises two sections, one portable device and a host computer. Fingerprint attendance device is a hand-held device which can be carried to the classroom. A Graphical user interface application in the host computer helps the faculty to manage the device. He can perform tasks like Enrolling the students fingerprint and the device is portable which means it can be taken to the classroom. Faculty can authorize and select the batch from a menu. In the first class, students have to register their finger-print by selecting roll number and placing their finger. From second class onwards, they can mark their attendance. The attendance details can be updated using the GUI application.

**Proposed Model:-**



The proposed system comprises two sections, one portable device and a host computer. Fingerprint attendance device is a hand-held device which can be carried to the classroom. A Graphical user interface application in the host computer helps the faculty to manage the device. He can perform tasks like add students, import and export attendance data etc. After feeding the student list to the device, faculty can take the device to the classroom. Faculty can authorize and select the batch from a menu. In the first class, students have to register their fingerprint by selecting roll number and placing their finger. From second class onwards, they can mark their attendance. The attendance details can be updated using the GUI application.

**Flowchart:-**



**Figure 1:-**

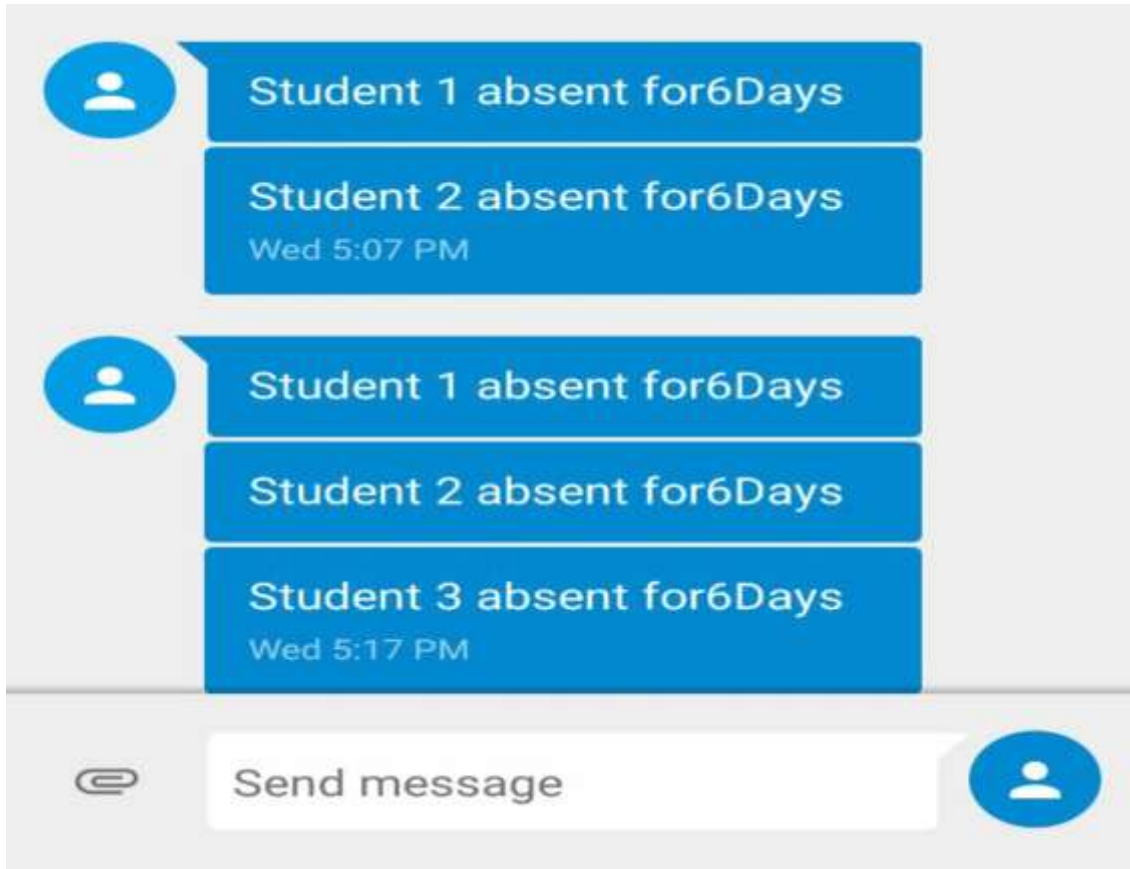
**Results:-**

```
pi@raspberrypi:~/Desktop/Project $ python new_final.py
Day1
Waiting for finger...
Welcome Student 1
Waiting for finger...
Welcome student 2
Waiting for finger...
Welcome Student 3
Waiting for finger...
Student Already Present
Waiting for finger...
Day2
Waiting for finger...
Welcome Student 1
Waiting for finger...
Welcome student 2
```

**Figure 2:-**Registering the Fingerprint

```
all.deb',
 dpkg-genchanges >../python-fingerprint_1.5_armhf.changes
 dpkg-genchanges: including full source code in upload
 dpkg-source --after-build src
 dpkg-buildpackage: full upload: Debian-native package (full source is included)
root@raspberrypi:/home/pi/pyfingerprint/src# sudo dpkg -i ../python3-fingerprint
*.deb
(Reading database ... 116366 files and directories currently installed.)
Preparing to unpack ../python3-fingerprint_1.5_all.deb ...
Unpacking python3-fingerprint (1.5) over (1.5) ...
Setting up python3-fingerprint (1.5) ...
root@raspberrypi:/home/pi/pyfingerprint/src# sudo apt-get -f install
Reading package lists... Done
Building dependency tree
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 193 not upgraded.
root@raspberrypi:/home/pi/pyfingerprint/src# sudo usermod -a -g dialout pi
sudo: usermod-a: command not found
root@raspberrypi:/home/pi/pyfingerprint/src# sudo usermod -a -G dialout pi
root@raspberrypi:/home/pi/pyfingerprint/src# python /usr/share/doc/python-finger
print/examples/example_enroll.py
python: can't open file '/usr/share/doc/python-fingerprint/examples/example_enro
ll.py': [Errno 2] No such file or directory
root@raspberrypi:/home/pi/pyfingerprint/src#
```

**Figure 3:-** Navigating to the parent directory



**Figure 4:-**Message to the registered Number

### Conclusions:-

The project thus satisfies the problem statement given as Biometric Monitoring Attendance System. It makes attendance marking easier and convenient and affordable. Also, we have included the password protection for this project which mean the changes can be done only with the approval of the admin. This system ensures security as the fingerprint of each student is unique. This system is highly accurate as it involves digital fingerprint sensing techniques for biometric access. As of now, this system can only be used with a smaller no of individuals for e.g. in a classroom. But with addition of memory either internally or externally we can not only increase the no of users but also, we can add more information like the complete profile of the student or the individual. This makes the system ideal for use in the industrial setups like offices and labs.

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