

BIOMETRIC ATTENDANCE SYSTEM *Fingerprint Attendance System Using IOT*

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ABSTRACT: Biometric Attendance System is a unique way of taking Attendance for identification and verification process using IOT. This is the system where we can actually avoid all the type of cheating or misuse of getting attendance, it is related to fingerprint scanning, which is unique identity of each person where duplication is not possible and we get greater percentage of accuracy. In this report we have compared various types of proposed system on fingerprint attendance system and improvement over it by adding the feature of GSM tracking of location and pass on the message to their respective Guardians through toll free text or email. Authentication has always been a major challenge in various places Verification of the authentic person is not an easy task, and also it consumes a lot of time and process.

Key Words: Fingerprint Scanning, IOT, GSM tracking.

I. Introduction

Fingerprints are now used in various fields for identification and verification purpose. They are used for attendance purpose in organizations to avoid proxy for criminal identification like terrorist, murderer and violators and also in passports (a matter of national high importance) of person. Here in this project we have tried to automate a classroom attendance system (conventional attendance system) by using a fingerprint recognition module interfaced with 8051 microcontrollers. A fingerprint recognition system can be used for both verification and identification of data. In verification, the system compares an input fingerprint to the pre saved fingerprint of a specific user to determine if that is the same finger (1:1 match). If it is not the same finger the system compares an input fingerprint with the prints of all enrolled users in the database to determine if the person is already known under a duplicate or false identity (1: N match) to identify fake person to be inspected.

II. METHODOLOGY

2.1 Fingerprint Enrolment

The Registered fingerprints are the unique type of fingerprints that are collected and enrolled in the system with person name, address and other identity.

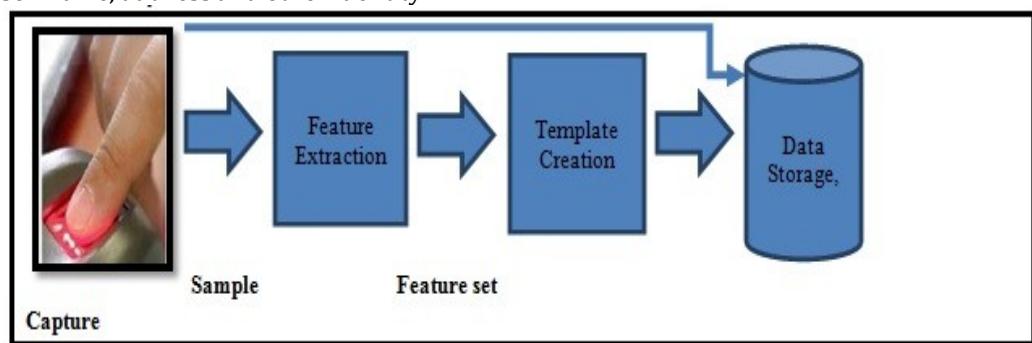
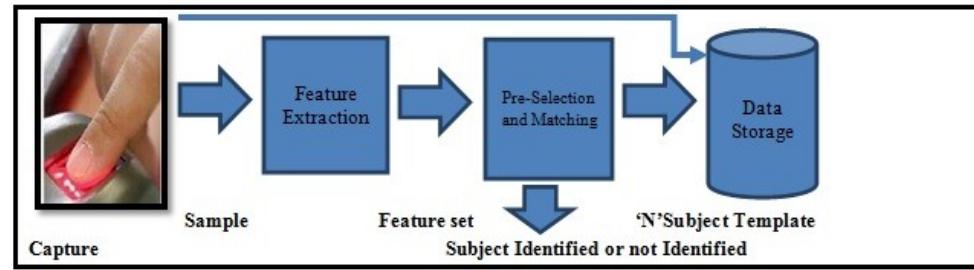


Fig a) Fingerprint Enrolment

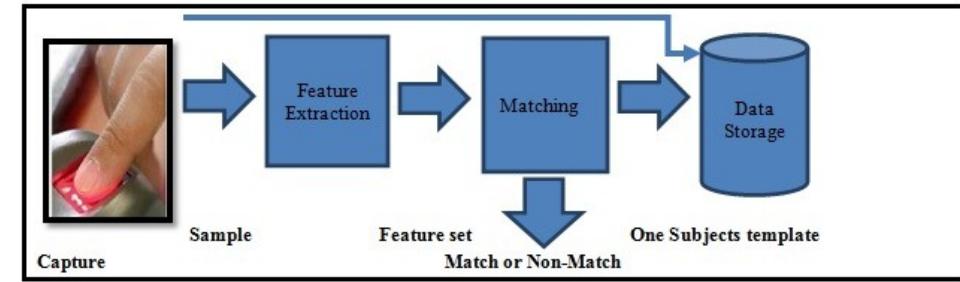
2.2 Fingerprint Searching

Searching of a fingerprint is a method, which matches the fingerprint of a person with multiple fingerprints stored in the database i.e. 1: N (one to many) matching

**Fig b) Searching**

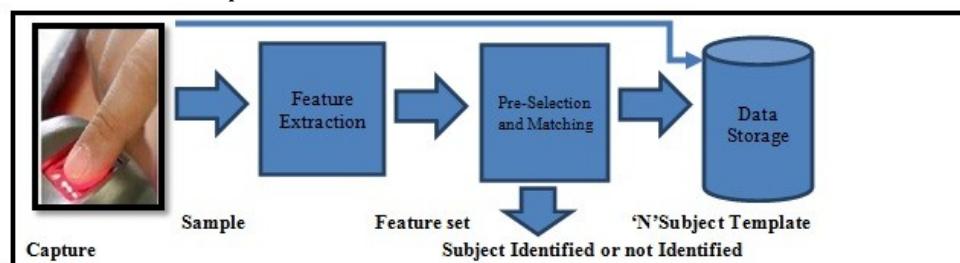
2.3 Finger print Authentication

Authentication of a fingerprint is a method to verify known person identity with 1:1 (one-to-one) matching. Database of fingerprint verification system contains fingerprint image respective to the user account.

**Fig c) Authentication**

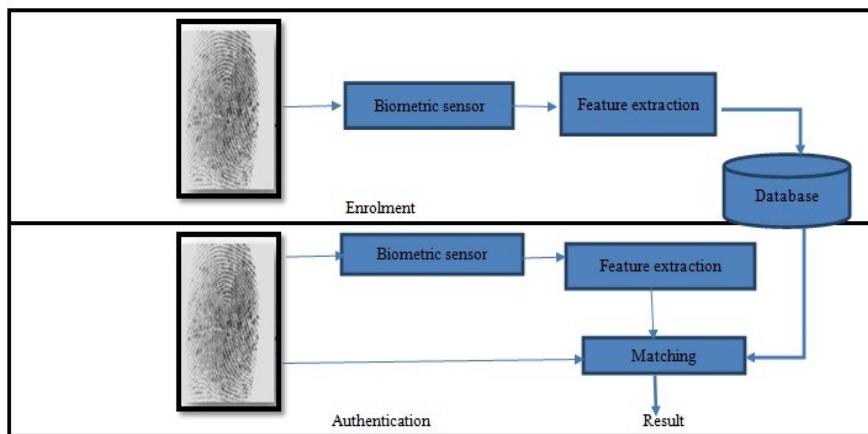
2.4 Finger print Deletion

Deletion of a fingerprint is used to delete the whole data of the user stored in the database. The data is deleted completely if the registered fingerprint is deleted by the Administrator. No memory is wasted in when the data is deleted of the particular user.

**Fig d) Deletion**

III. WORKING

3.1 Working of scanner

**Fig e) Working of scanner**

- **Administrator:**

- First the Administrator enroll the student data in the scanner.
- Administrator uses SFG software to enroll student data.
- This enrolment is done so that it is easy to maintain the record of registered user.it is a onetime process.
- Without registration the attendance is not marked and the user becomes invalid user.
- Administrator can also verify and identify the particular user using SFG Application.
- All the attendance Records of student can be viewed by the Administrator.

- **User:**

- The user first performs the identification and verification process in the SFG Application.
- The user has no right to enroll the data in the application.
- If the Fake or unregistered student tries to mark attendance using their finger print sample that will be invalid and the attendance will not be marked.
- Only the authorised users fingerprint matches with the stored data in the application. And attendance is marked for the students.

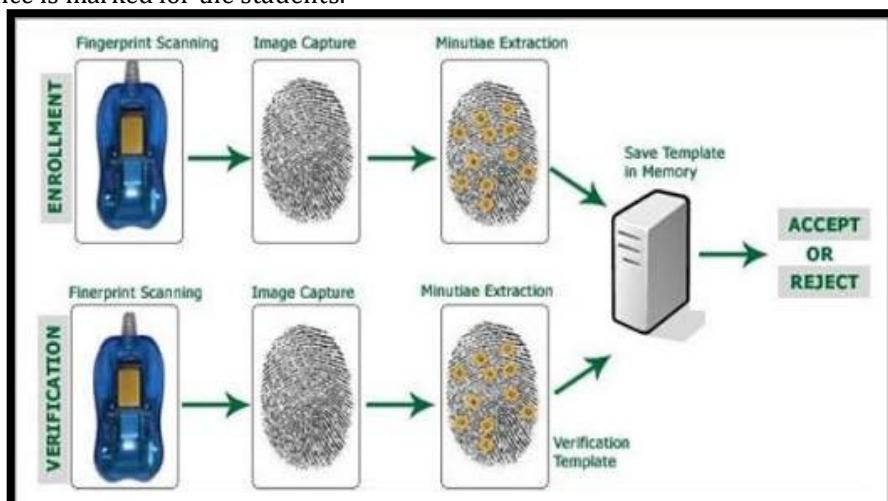


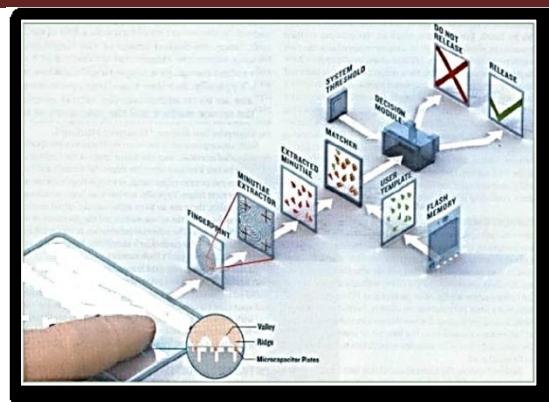
Fig f) user enrolment and verification

To start up with this project the administrator has to enter the data of the students into the database of the fingerprint sensor, for that fist we need to take the impression of that student to whom we want to give authentication to the system. This is done once when we register for the first time i.e. new entry of student to be added in the system. There are two types of enrolment in this project. First is for administrator which controls the activity of device. For the "Enrolment" we have introduced a function in Arduino. The device is primarily enrolled by admin user. Without the access of admin, no user can register themselves. After the admin grant access to the new user he/she can scan finger for attendance and become a valid user. Second Enrolment is made for the user. After that we use the fingerprint to check the fingerprint of the user, the system compares the fingerprint input received at its optical plate with the previously stored fingerprint from its flash memory. If the entry matches with the memory, then it gives "OK" signal along with the identity number of that student. But if the entry does not match with the memory, then it gives out "ERROR" signal. The record is then sent serially to the Admin PC using UART communication. The details are then extracted in the text format in the Admin PC.

3.2 Working of fingerprint Module

Fingerprint is a pattern made up of ridges and valleys on our fingertip skin. While storing the entry in the database, scanner takes an image of this pattern and stores in its own memory.

Then while performing search operations, it again takes pattern of the fingerprint of that user who needs to gain access. This pattern is compared with all patterns that were previously stored in the memory. In short it performs the task which is related to Digital image processing. It performs various iterations and executes matching algorithms and if it finds exact match then it gives out fingerprint ID number. Otherwise it gives out "ERROR" signal.

**Figure g) fingerprint module**

3.3 Working of GSM module

- The GSM module help us pass the information to the parent of respective student.
- It has to be interfaced with the fingerprint scanner and the Arduino.
- With the help of tool free msgs, the message is done, so that parents are aware of student's attendance record.

IV. References

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