

FINGERPRINT BASED HALLTICKET MANAGEMENT SYSTEM

ABSTRACT:

The project fingerprint-based hall-ticket management system has been done in the aim of eliminating the fuzzy process of student verification and assigning booklet to the corresponding student. That is, the student verification and eligibility is done through a simple fingerprint processing of each student, and the booklet data is stored for the corresponding student via a barcode scanner. The barcode data and attendance data are wholly sent to a centralized account of Exam Evaluation Department for paper evaluation.

WORKING METHODOLOGY:

Enrolment, verification and booklet assignment are the three important stages in this system.

In the first stage, admin assigns the fingerprint data of each student with the profile and adds the course examination details one by one or totally import a bulk amount of student profile data from an Excel sheet or a tab coded notepad (.txt) file through a desktop application by the administrator.

As the second stage, the verification of the fingerprint has been done and attendance for the student will be marked.

1. When the fingerprint surface is pressed, feature set is created which tells the unique features of the person.
2. The field containing the fingerprint information is retrieved from the database.
3. One to N comparisons are performed to match the feature set with any one of the fingerprint information retrieved from the database.
4. If the match is found, the value in the particular field should be automatically updated as '1' else if the match is not found, it should be automatically updated as '0'.

Each person's fingerprint is scanned, analysed and then stored in the coded form in the database.

In the second stage, the scanner takes the fingerprint and checks it against all the fingerprints in the database stored during enrolment.

One way of scanning the fingers is Optical scanner. The following steps are involved in the working of optical scanner:

1. When the finger is pressed LED scans the bright light at the surface of the glass.
2. The quality of the image depends upon the way of pressing, light level of the hall, how clean the finger and the surface is.
3. Reflected light bounces back from the finger to CCD (Charged Couple Device) or CMOS image scanner through the glass.
4. The longer the image-capture process takes place, the brighter the image formed on the image sensor.
5. If the image is too bright, areas of the fingerprint won't appear in a clear manner. And if the image is too shady, the areas of the fingerprint will appear in black colour.
6. An algorithm checks if the image is too bright or too shady and indicates it with sound or LED indicator light and we go back to step 1 and try again.
7. If the image is accepted, another algorithm tests the fingerprint by counting the number of ridges and make sure that the images is clearly visible. If the algorithm fails go back to step 1 and try again.
8. Once after the images passes the testes of above two algorithms, the scanner signals that the image is OK to the operator, the image is then stored in the flash memory and transmitted to the host computer.

9. The host computer either store the image on the database if it is first time loaded or compare it against all the other fingerprints to find a match for the purpose of verification.

The above methodology uses sophisticated pattern matching software to turn the image into code. The algorithms used in the above methodology will find and store the information like where the ridges and lined end, how are the whorls, curves and loops present in the finger of the particular person. These distinctive features are collectively called as Minutiae, which is considered in the process of matching and result returns either true or false.

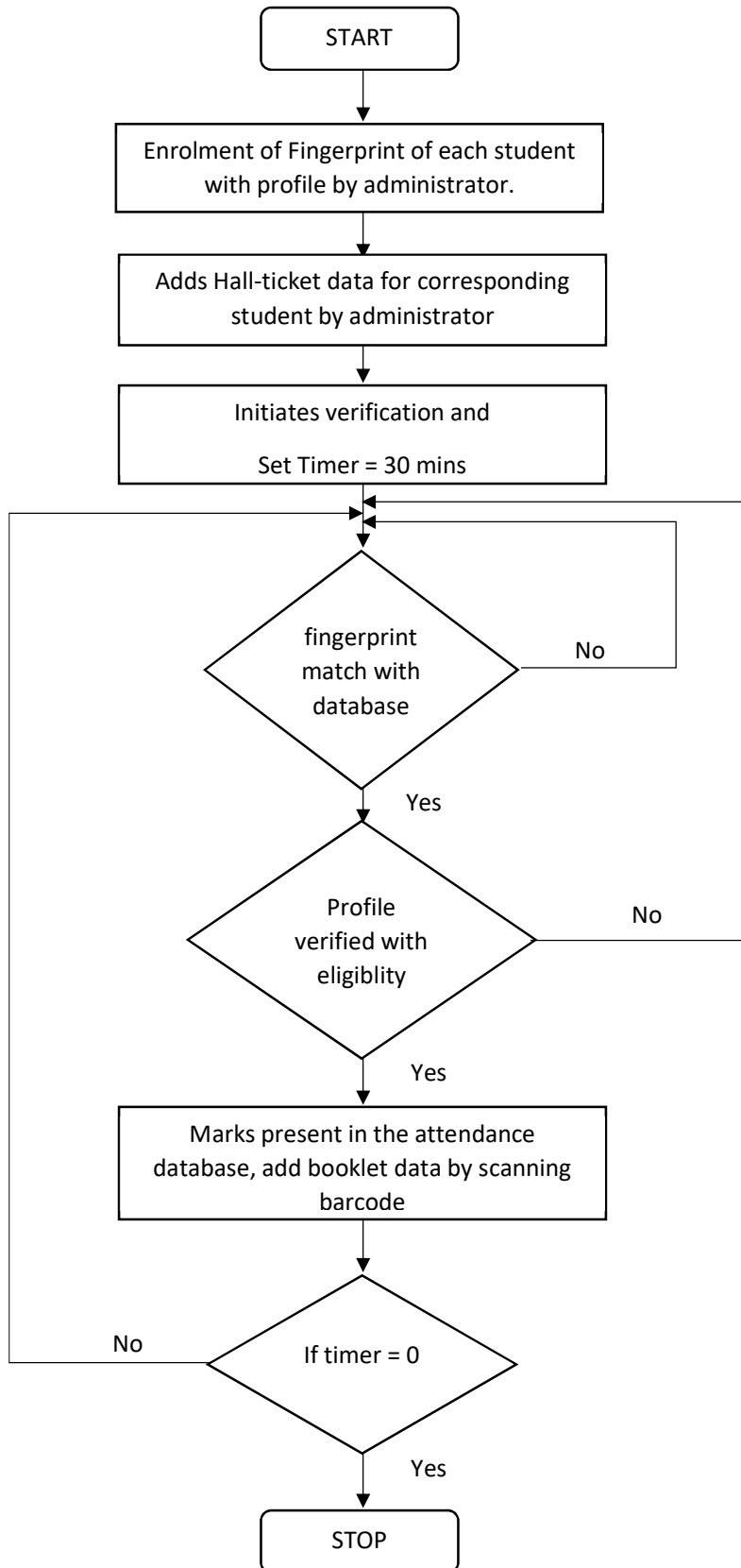
If the fingerprint is matched, then the student data is compared with the student's profile for eligibility of attending the examination. If it is true, then it will mark the attendance for the student as present and displays valid in the LED connected to the module. Else if the fingerprint gets matched and the student is not eligible and if the fingerprint doesn't get matched, and the student will not be allowed to attend the exam.

Then a random booklet is given to the student, and the barcode present in the booklet will be scanned to the barcode reader connected with the module and the barcode data will be assigned to the corresponding student in the database.

APPLICATIONS:

This system can be used in all the examination centres throughout the world such as it can be used in schools, colleges and other government and private examination centres.

FLOW DIAGRAM:



REQUIREMENTS:

- Biometric Fingerprint Scanner
- Hand held Barcode Scanner
- Raspberry Pi model 3b+
- Switches and wires