Brainy Vehicle Scheme for Attendance and Apprehension

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Abstract—**The universities, colleges and whole organizations where security and total productivity is vital, access to certain areas must be controlled and monitored through an automated scheme of attendance. Managing people is a difficult task for most of the organizations and maintaining the attendance record is an important factor in people management. When considering the academic institute, taking the attendance of non-academic staff on daily basis and maintaining the records is a major task. Manually taking attendance and maintaining it for a long time adds to the difficulty of this task as well as wastes a lot of time. For this reason, an efficient system is transportable in this paper to solve the problem of manual attendance. This system takes attendance electronically with the help of a fingerprint sensor scheme, and all the records are saved for subsequent operations. This can be used in order to overcome the human errors.The transportable scheme will also improve the productivity of any organization if properly implemented.**

Keywords—fingerprint sensor ;embedded linux; transportable attendence scheme; gsm hi- tech

I. INTRODUCTION

In this paper provides the design method of transportable fingerprint based on student attendance scheme using GSM. The scheme includes latest fingerprint recovery module and attendance module. It can realize automatically such functions as information recovery of fingerprint processing, wireless transmission, fingerprint matching and making an attendance report. After taking the attendance, this scheme sends the attendance of every student to their parent's mobile through GSM. Attendance scheme facilitates access to the attendance of a particular student in a particular class. This scheme eliminates the need for stationary materials and personnel for the keeping of records.

The transportable scheme uses biometrics(fingerprint) to mark attendance which eliminates the problems of proxy and human error altogether. It also uses data recovery by which the attendance stored in the memory is extracted into a database which is easier to manage and maintain compared to sheets of papers.

Every professor's fingerprint is also stored so that it automatically comes to know which lecture is going on and the memory is divided in such a way that a professor can mark attendance and pass the module to another professor and still have the attendance of his lecture saved as the attendance of the next professor is saved in a different memory slot. Also the option to clear the memory is protected by a password therefore only a professor can clear the data recorded after extracting it to a computer.

II. OVERVIEW TRANSPORTABLE ATTENDENCE SCHEME

Attendance management is the act of managing attendance or presence in a work setting to minimize loss due to employee downtime. Attendance control has traditionally been approached using time clocks and timesheets, but attendance management goes beyond this to provide a working environment which maximizes and motivates employee attendance.

Moreover, in many colleges, and academic organizations, attendance is an important part which is used for various purposes. These purposes include record keeping, assessment of students, and promotion of optimal and consistent attendance in class.In developing countries, a minimum percentage of class attendance is required in most institutions and this policy has not been adhered to, because of the various challenges the present method of taking attendance presents. This traditional method involves the use of sheets of paper or books in taking student attendance. This method could easily allow for impersonation and the attendance sheet could be stolen or lost. Taking of attendance is time consuming and it is difficult to ascertain the number of students that have made the minimum percentage and thus eligible for exam. Thus, there is a need for a scheme that would eliminate all of these trouble spots.

A. *Architecture Of Raspberry-Pi*

Raspberry pi is a dynamic microcontroller that is a capable of just about anything in a computer. It runs with embedded programming languages and is a great way to learn about hardware fingerprint id scanning machine. It is small in size and of low cost. The raspberry-pi model is presented in Fig.1.
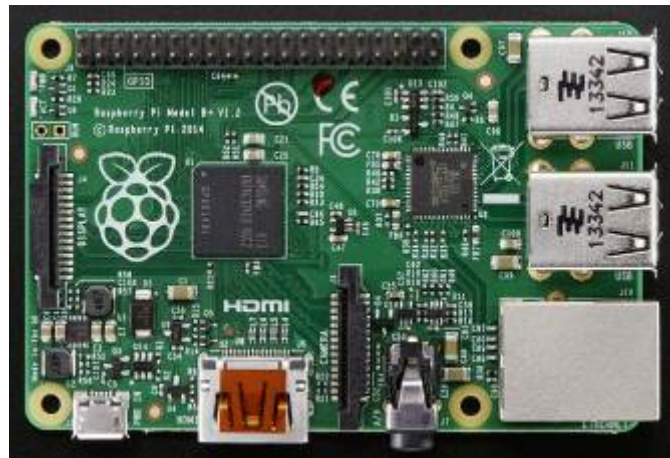

Fig.1. Raspberry-Pi Model

B. *Finger Print Scanner Using AudinoKit*

Fingerprint scanners are security systems of biometrics. They are now used in schools, colleges, and whole organizations. Everyone has marks on their fingers. Those marks are unique for all and cannot be altered.

The fingerprint model is presented in Fig.2.

Fig.2. Fingerprint scanner model

C. *Features Of Fingerprint Scanner*

Several fingerprint scanners are commercially available. Certainly, the main characteristics of a fingerprint scanner depend on the specific sensor mounted which in turn determines the image features (dpi, area, and dynamic range), size, cost, and durability. Other features should be taken into account when a fingerprint scanner has to be chosen for a specific application.

• **Interface:** FBI-compliant scanners often have analogue output (e.g., RS-170) and a frame grabber is necessary to digitize the images. This introduces an extra cost and usually requires an internal board to be mounted in the host. On the other hand, in non-AFIS devices, the analogue-to-digital conversion are performed by the scanner itself and the interface to the host is usually through a simple Parallel Port or USB connection.

• **Frames per second:** This indicates the number of images the scanner is able to acquire and send to the host in a second. A high frame rate (e.g., larger than 5 frames/sec) better tolerates movements of the finger on the

sensors and allows a more friendly interaction with the scanner. It can also provide a natural visual feedback during the acquisition.

• **Automatic finger detection:** Some scanners automatically detect the presence of a finger on the acquisition surface, without requiring the host to continually grab and process frames; this allows the acquisition process to be automatically initiated as soon as the user's finger touches the sensor.

• **Encryption:** Securing the communication channel between the scanner and the host is an effective way of securing a system against attacks. Forthis purpose, some commercial scanners implement state-of-the-art symmetric and public-key encryption capability.

• **Supported operating systems:** Depending on the application and the infrastructure where the fingerprint scanners have to be employed, compatibility with more operating systems, and in particular the support of open-source operating systems such as Linux, could be an important feature.
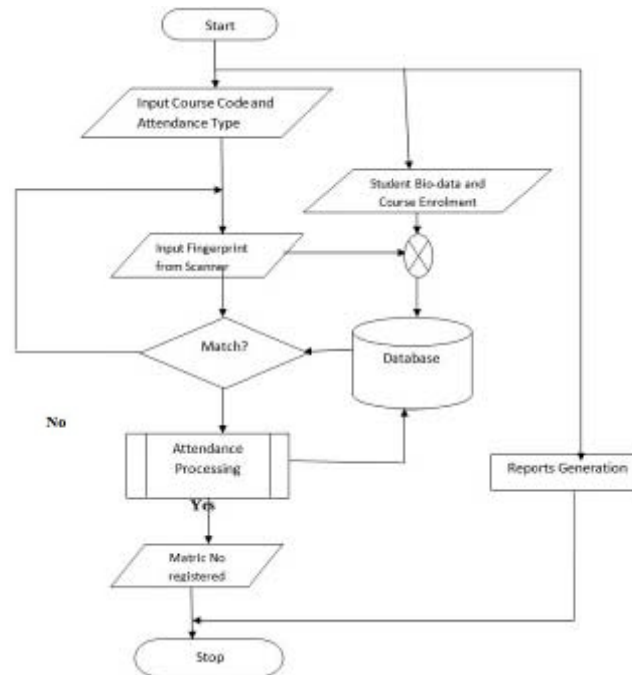

Fig.3. FPS Flow Chart

III. PROCEDURE OF TRANSPORTABLE ATTENDENCE SCHEME

In our system, there is a biometric scanner to recognize the fingerprint and then return the respective Id. Fingerprint scanner is interfaced with Rpi through serial port. It is triggered in such a way that for every 500ms it will search for a finger. If valid finger is placed on the fingerprint scanner, it will return a valid ID. Otherwise, it returns an ID 255 which meansan error is occurred and the process is a continuous process. Initially, the templates of all the students' fingerprints are collected and stored in database of fingerprint scanner.Flowchart of working of fingerprint scanner is as shown in fig.4.

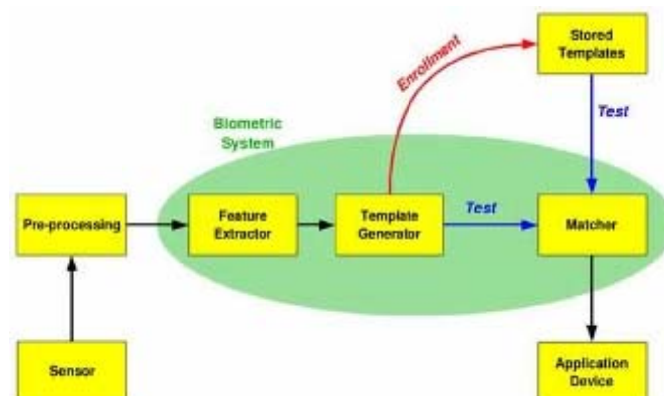Fig.4. Working Of Fingerprint Scanner

IV. TRIAL-AND-ERROR EXECUTION

First connect the fingerprint scanner to the Raspberry-pi serially. The fingerprint scanner works with 5V andRpi works at 3.3V. Thelevel converters are required. The fingerprint scanner with interfacing board has 2 LED's, says red and green. If the valid input is given, the green LED blinks to assure that the fingerprint matches with stored templates. If not, the error pops with the red LED.The FPS execution block diagram is shown in fig.5.
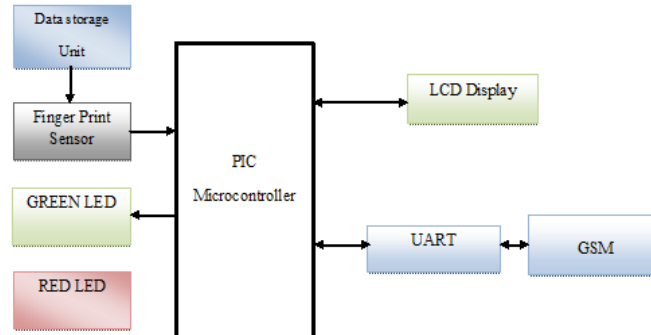

Fig.5. Execution of FPS

Table 1. User attempts and successes

USER	ATTEMPTS	SUCCESS 1	SUCCESS 2
SUNDHAR	10	0	0
VIGNESH	20	0	1
JERRY	30	1	1
MONISH	40	0	1
SRINIVASH	50	1	0
KARTHIKA	60	0	0

V. SUMMARY

The fingerprint has a lot of advantages, such as unique, permanent, good anti-fake and easy to use. When an individual first uses a biometric system, their identifying features are enrolled as a reference for the future comparison. This reference may be stored in a central database or on a card (or both) depending on the needs of the application.

VI. FUTURE ENHANCEMENT

This is one of the precise scheme can be used as proper fully automated attendance system in educational universities and colleges. Fingerprint scanner used in this scheme returns exact Id of matched fingerprint sensor. This is a fully automated scheme with high cost and works very precisely with very less human intervention. As it's a movable device, so it reduces a time of teacher and made whole transportable scheme and its less time consuming and easy to use.
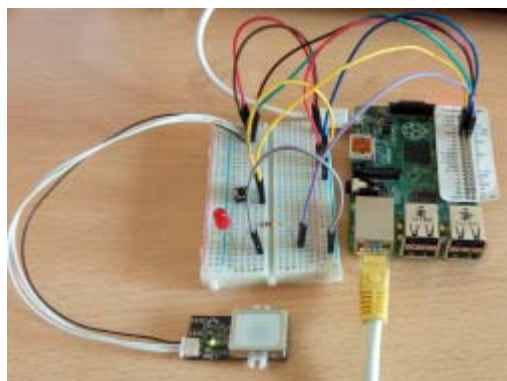
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