



Automated Biometric Attendance Management System

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Abstract — Security plays an important role in many elite organizations such as schools, colleges and institutes, military organization etc. because of the development in various implementation security systems it has been essential part to cope up with emerging new technologies related to security. Biometrics played an important role in providing with the following security issues. Since the human body has unique and abstract features, physical traits which differs from individual to individual it led to the development of biometrics in ensuring security in various field with the help of various embedded systems and computers. Various identification schemas are included in biometrics such as face recognition, iris recognition, fingerprint or thumb recognition. Accuracy, efficiency and reliability are the vital parameter that is resolved with the help of biometric applications with the use advanced embedded system. This project aims to reduce the hectic manual work by implementing an automated attendance management system in which we transfer the data to the server with the help of internet. This project provides the design method with the use of Raspberry Pi. The biometric technique that is used in this project is the finger print recognition with the help of R305 fingerprint module that is used for authentication. When the respected teacher authenticates the system with his fingerprint and password the following subject, time, date slots are selected and then the fingerprint scanner is passed on to the students for their authentication after which their attendance is marked.

Keywords: Biometrics, Raspberry pi, Fingerprint Authentication, R305 Fingerprint Scanner etc.

I.INTRODUCTION

Attendance is for keeping records of number of students present in schools, colleges or in any organization. It is very important strand in maintaining discipline among employees in an organization and imparting quality education in schools, colleges and if someone drifts from required standards proper action can be taken. This system uses the concept of attendance management with the help of biometric. Various biometric technologies are fingerprint, face, iris, hand geometry, voice and signature recognition. Among all those, fingerprint technology is the oldest biometric technology, but still it is most widely used because it provides good levels of accuracy and simplicity. Fingerprint identification is the method by which we can uniquely identify two persons. This technology is highly reliable for the recognition purpose because of their individuality and constancy over the time. Also, the fingerprint is fast biometric technique for more reliable and secure system. A portable module is designed which has the capability of recognizing the students via their fingerprints and then sending the ID of the student to the server whose fingerprint is recognized. First of all the system requires connectivity to internet which can be provided through Wi-Fi or USB modem. With the help of fingerprint scanner module R305 recognition of the student takes place and once the fingerprint is matched the ID of the student is send to the server. The server is basically a database which contains all the records of the attendance. This system removes the drawbacks such as proxy attendance, extra efforts of teachers calculating the attendance percentage, calculation error etc. device is a key unit in this system. Handheld devices are employed for taking and sending attendance. In this proposed system we use a handheld device and a web server. The handheld device consists of Raspberry Pi, Fingerprint scanner(R305), LCD for displaying, and a Keypad .The web server is used for updating and storing the attendance.

II.LITERATURE SURVEY

With the help of previously implemented systems, we came across various methods of attendance management system. some of the methods are mentioned in the below literature survey.

Attendance system by A. A. Sulaiman, M. S. Abu Bakar, M. Z. H. Noor, S. A. C. Abdullah ‘ Easy Access Attendance Management System(EAMS)’,

In this paper we come across the concept of barcode scanner that is used for attendance marking of the students. There is an Identification Card that has a printed series of barcode at the back of the card which represent the Identification Number (IDNumber) for the card holder. There is a barcode reader which is connected to a computer/laptop. The students will scan their barcode with barcode scanner which will be recorded by developed software. Thus this system uses barcode scanner as a main component for the attendance of the students. Hence this system uses RFID technology for scanning of the data.

Biometric authentication technique by Ms. Manjiri Pathak, Divya Prajapati, Vidya Prajapati, Bipin Nair, Swapnil Deo ‘Wireless Fingerprint Attendance Management System’ IJIR 2017.

In this paper the basic concept of attendance using biometric authentication is used. This paper uses the methodology of wireless transmission of data using ZigBee model and ARM7 LPC2148 which is the major component part of the project. The transmission of the data to the end server using ZigBee module from all the other techniques is efficient because it has low power consumption. Considering the network topology of the ZigBee network it uses wireless local area network which is a cluster tree network. To resolve the problem of time delay when the image is transmitted by ZigBee technology, the traditional transmission mode is improved.

Attendance technique by Riya Lodha,, Suruchi Gupta, Harshil Jain, Harish Narula ‘Bluetooth Smart Based Attendance Management System.’ ICACTA-2015.

In this paper we come across the concept of Bluetooth smart chip which is controlling most of the android application. The RFID scanner is used to scan the electronic tags provided to the students. A Bluetooth Smart chip is programmed and configured such that it works in connection with the Android application via Bluetooth. Every student is given a specific tag, which can then be detected by the application via Bluetooth Low Energy. When he/she attends the lecture, a serial number (related to each student’s SAP number) of the tag is associated with the student database entry. Therefore, every time a student carries his/her card and is attending the lecture the entries will be entered into the database with the time stamp as the lecturer moves around the class and the application detects the tags. Also, the application is configured to detect tags only within a particular range in order to avoid detection of tags that are outside the class. Since the Bluetooth spectrum range works in(the 2.400 GHz-2.4835 GHz ISM band).

Biometric attendance system technique by Dhiman kumar sarkar, Nafize Ishtiaque Hussain, insane Arafat Jamil ‘Design and Implementation of Smart Attendance Management System using multistep Authentication System.’ IWCI-2016.

This research papers implements the attendance system using Arduino Mega 2560, RFID and biometrics that is finger print scanner. This system makes use of all the system including RFID and also biometrics. This research paper looks over all the possibilities if any one of the system fails. Here the implementation takes place using arduino Mega 2560 which is interfaced with the fingerprint scanner and the RFID. For display of the authentication process 16*16 LCD screen is used which is interfaced with the keypad for the output.

Attendance Management System technique by M.Amir Abas , T.B.Tuck , M. Dahlui ‘Attendance Management System (AMS) with Fast Track Analysis’.IEEE 2014.

The whole illustration of the AMS is conceptualized as the system starts with recording individual attendance using RFID smart card collecting detail information on the time and date. Once the student touches the RFID reader with their student ID card, he/she has 15 sec to enter the classroom for final ID recognition. This is monitored by the movement sensor for ensuring the student enters the classroom instead of just touches the card, and that the student does not enter twice with other student's ID. Towards the end of the lecture session, all the Student's ID have been secured in a MMC card. The lecturer will activate the AMS system to read the data and a conversion process is carried out from text file to database file.

III. IMPLEMENTATION

Biometric attendance system is a management system for efficient tracking of the attendance in any of the organization. Because of the use of biometrics in the attendance system many of the drawbacks of other system such as RFID scanner, zigbee, bluetooth is removed. Manual labour, error redundancy, proxy attendance is reduced.

3.1. Proposed Architecture

3.1.1. Block Diagram:

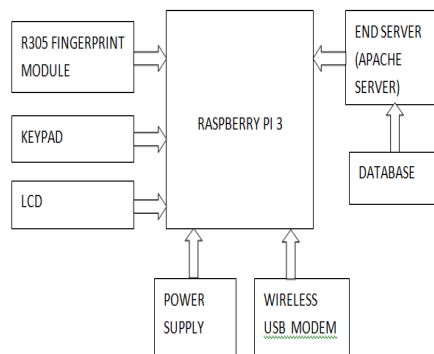


Fig.1 Block diagram of proposed system

The figure 1 shows that the Raspberry Pi is interfaced with LCD, Keypad and fingerprint sensor. The data is send to the server with help of wireless USB modem. There is an interface established between the web server and the raspberry pi. The fingerprint is taken from the R305 scanner and the information regarding the fingerprint (that is port number is assigned to it) is stored in the Raspberry Pi. The LCD is used for the displaying the authenticated user and keypad is used for manual entering of the password. The apache server is the end result where all the data is stored regarding the attendance of the students. The server consists of all the database regarding the name and password of a respective person to enter into the database, information regarding the timeslot, subjects etc.

3.1.2. Flow chart:

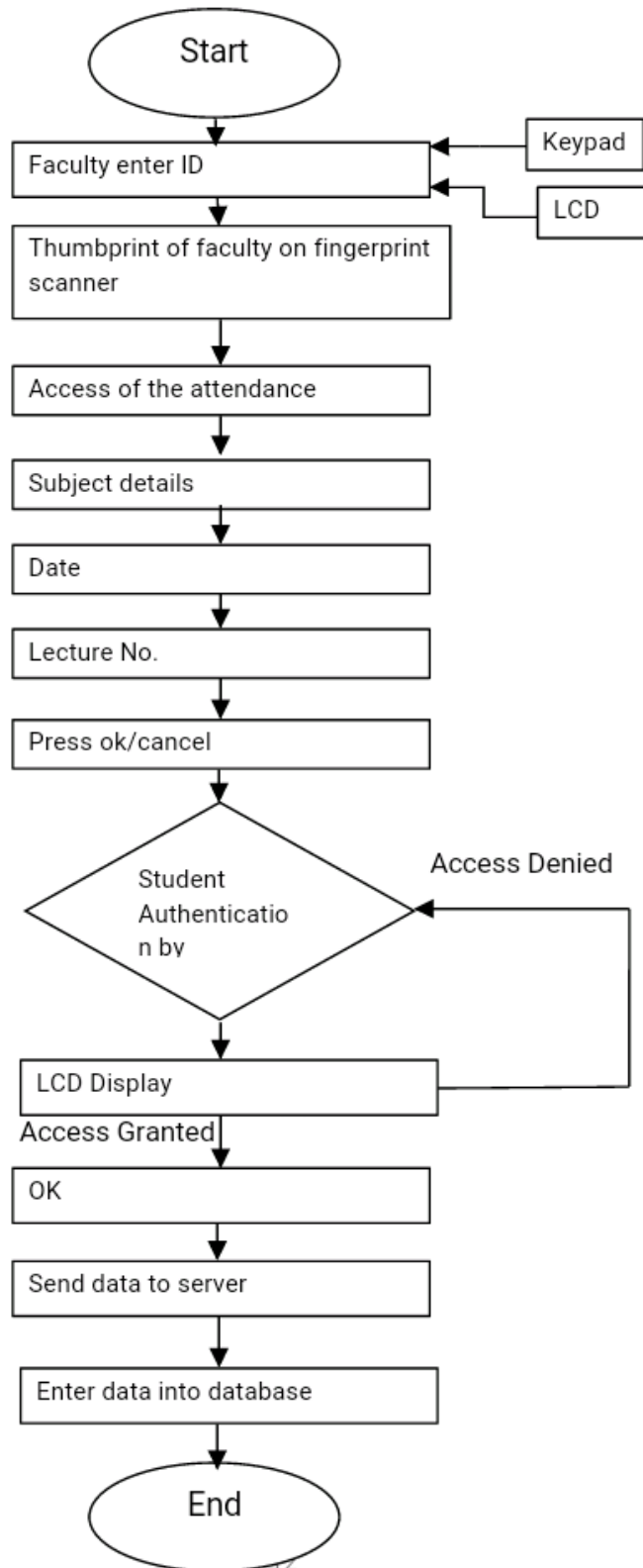


Fig 2 Flow chart of proposed system

IV. RESULTS AND DISCUSSIONS

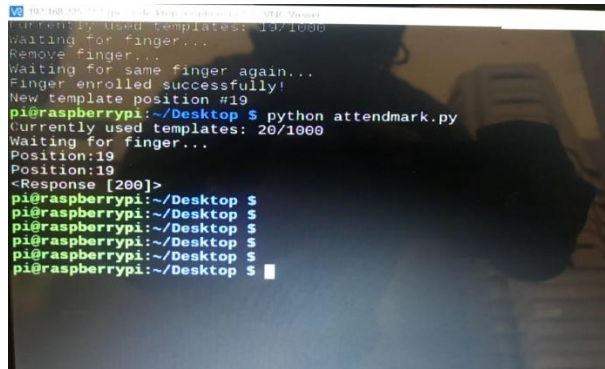


Fig 3. Enrolling the fingerprint

Fig 2 shows the code is used for successfully enrolling the fingerprint which is then assigned a template or position no after matching of the fingerprint .this template number which is assigned will be unique for every individual When the fingerprint is taken for the authentication it checks for the position or the template no and if correct students fingerprint is matched then the response is generated.

Options							
	studid	figid	etype	studname	clas		
<input type="checkbox"/>	2	2	cnf	sushama	beelec	Edit	Delete
<input type="checkbox"/>	3	1	cnf	Shubham	beelec	Edit	Delete
<input type="checkbox"/>	6	5	cnf	ABcd	beelec	Edit	Delete
<input type="checkbox"/>	7	6	cnf	vaibhavi	beelec	Edit	Delete
<input type="checkbox"/>	8	7	cnf	kirti	beelec	Edit	Delete
<input type="checkbox"/>	9	8	cnf	Ronald	faculty	Edit	Delete
<input type="checkbox"/>	18	19	cnf	Yash	BE EXTC	Edit	Delete

Fig 4. Confirmation of the fingerprint

Fig 3 shows assigning particular student with the student id and its finger print id that its template position no in data base.

Options	
figid	tstam
1	2018-02-22 14:45:06
1	2018-02-22 14:48:37
2	2018-02-22 15:16:11
5	2018-02-22 15:20:34
6	2018-02-22 15:29:54
7	2018-02-22 15:38:37
8	2018-02-22 16:03:46
6	2018-02-22 21:48:19
6	2018-02-22 22:00:58
19	2018-02-23 15:16:01
19	2018-02-23 15:26:00

Fig 5. Attendance marked

Fig 4 shows when attendance is marked of a particular student then student id can be seen at what time and date the student is marked present.

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