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Biometric Attendance System

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ABSTRACT

In this paper provides the design method of portable web based fingerprint based student attendance system using ESP8266 wifi model with IoT. The system includes terminal fingerprint acquisition module and attendance module. It can realize automatically such functions as information acquisition of fingerprint, processing, wireless transmission, fingerprint matching and making an attendance report. After taking the attendance, this system sends the attendance of every student to their parent's email through SMTP. Attendance system facilitates access to the attendance of a particular student in a particular class.

Keywords: Fingerprint identification, Attendance System, Wireless communication

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I. INTRODUCTION

Presently, attendance of students in most institutes is taken by the teacher on paper based attendance registers. There are various disadvantages to this approach such as data is not available for analysis because paper based registers are not uploaded to a centralized system, time taken for data collection reduces the effective lecture time and fake attendance by students. Some universities also use wall mounted RFID swipe card systems. RFID (Radio Frequency Identification) is a wireless technology which uses electromagnetic waves for communication between RFID reader and RFID tag. Though better than paper based systems, RFID based systems also have certain problems such as the system is complex, costly and absent student's card can be swiped by other students.

Biometric techniques can be used to solve these problems. Biometric is derived from two Greek roots "bios" meaning life and "metrics" meaning measurement. Biometric technology identifies a person uniquely based on his/her characteristics which can be physiological or behavioural. Among the various biometric techniques, there are nine main biometric techniques which are widely used. These include fingerprint, face, hand vein, hand geometry, iris, retinal pattern, voice print, signature, and facial thermograms. Comparison of different biometric techniques has shown that fingerprint biometric is a reliable, mature and legally accepted biometric technique [1]. Therefore, Fingerprint based attendance system can be used for identification of large number of students in universities and also for attendance monitoring of employees in organizations.

There are two stages of working of these systems 1) Enrolment of fingerprints. 2) Matching of Fingerprints. The basic steps are shown in Fig. 1

II. LITERATURE SURVEY

Numbers of related literatures based on electronic device for student attendance record currently exist as reviewed below. In [2], an embedded computer based lecture attendance management system was proposed. Although this was an improved system with electronic card reader serially interfaced to a personal computer, the demerit of such system is that someone can still take attendance for another person if given the person's electronic card.

Authors in [3] used a wireless attendance management system that authenticates using the iris of the individual. This system uses an off-line iris recognition management system for image capturing, extracting precise details, storing and matching the captured image with one stored in the database. This system takes care of wrong clocking in or buddy-punching. Buddy punching is when one worker or student inappropriately clocks in for another. The only problem this type of biometric system has is that people usually have the fear that the Iris scanner, after sometimes might contribute to the damage of their eye and so tend not to embrace it.

The authors in [4] designed and implemented a system that authenticates the user based on passwords. This system still could not eliminate impersonation since the password can be shared or tampered with. Passwords many times can be forgotten or the system hacked thereby preventing user's access to the system.

In addition, we have other solutions such as RFID-based authentication system and GSM-GPRS based authentication system. There are issues with all these device-based solutions. The GSM-GPRS based systems use the location of class for attendance marking which is not dynamic. Thus, wrong attendance might be recorded if there is a change of venue. Problem with RFID [5] based authentication systems is that RFID cards can get lost, stolen, and it requires the installation of RFID detectors. RFID cards can also not eliminate impersonation.

III. PROPOSED SYSTEM

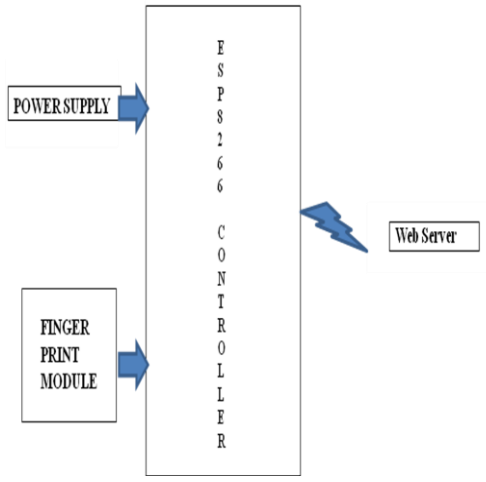

Fig 1. System architecture

A. System Flow

This system consists of biometric based attendance management system (Fig.1). We designed the biometric based technology to detect the user thumb and stored the server to calculate the student attendance.

Hardware Component:

1. **ESP8266**

Fig 2. Wi-Fi model

Feature:

- Voltage:3.3V.
- Wi-Fi Direct (P2P), soft-AP.
- Current consumption: 10uA~170mA.
- Flash memory attachable: 16MB max (512K normal).
- Integrated TCP/IP protocol stack.
- Processor: Tensilica L106 32-bit.
- Processor speed: 80~160MHz.
- RAM: 32K + 80K. • GPIOs: 17 (multiplexed with other functions).
- Analog to Digital: 1 input with 1024 step resolution.

2. **Finger Print Scanner**

This is a fingerprint sensor module with TTL UART interface for direct connections to micro-controller UART or to PC through MAX232 / USB-Serial adapter R305 module is used to take a entry of person by Thumb input. Finger Print Scanner processing include two types of matching 1:1 or 1:N.When enrolling user needs enter finger two times. Add , search ,delete can be done along with keypad.

Fig 3. Thumb device

IV. CONCLUSION

The main purpose of this project is to monitor the student attendance in lecture, tutorial and laboratory sessions in more efficient way and send this attendance to their parents. Fingerprint attendance system is a cost effective simplified

system that uses fingerprints for identification. The fingerprint is unique to each individual and cannot be shared.

V. FUTURE SCOPE

The functionalities of the system can be further enhanced through the following recommendations:

1. The module could be remotely connected to a PC wirelessly so the administrator can have access to the attendance data without physically interfacing the Module with PC.

2. The Module can be interfaced with a GSM Module to send SMS to the Security Personnel anytime an unregistered finger tries to sign-in or out or to parent notifying him/her of his/her child's attendance records.

REFERECNES

[1] D. Acharya and A. K. Mishra, "Wireless Fingerprint based Student Attendance system", National Institute of Technology Rourkela, 2010. http://ethesis.nitrkl.ac.in/1765/

[2] C. Saraswat, C. et al, "An Efficient Automatic Attendance System using Fingerprint Verification Technique". International Journal on Computer Science and Engineering. 2(02):264-269, 2010

[3] S. Pankanti, S. Prabhakar, and A.K. Jain, "On the Individuality of Fingerprints". IEEE Transaction on Pattern Analysis and Machine Intelligence.24(8), 2002

[4] O. Shoewu and O. Badejo, "Radio Frequency Identification Technology: Development, Application and Security Issues". Pacific Journal of Science and Technology. 7(2):144-152,.2006

[5] T. Nawaz, S. Pervaiz, and A.K. Azhar-Ud-Din, "Development of Academic Attendance Monitoring System Using Fingerprint Identification".2009

[6] M. Kamaraju, P. A. Kumar, B. A. Krishna and B Rajasekhar, "Embed -ded Fingerprint Recognition System", Recent Researches in Telecomunications, Informatics, Electronics and Signal Processing, 2013

[7] O.O Shoewu, M. Olaniyi, and A. Lawson, "Embedded Com puter-Based Lecture Attendance Management System". African Journal of Computing and ICT (Journal of IEEE Nigeria Computer Section). 4(3):27 – 36, 2011

[8] S. Kadry, and M. Smaili, "Wireless Attendance Management System Based on Iris Recognition" 2010.

[9] K. L. Cheng, T. Xiang, Hirota, and K. Ushijimaa, "Effective Teaching for Large Classes with Rental PCs by Web System WTS".Pro. Data Engineering Workshop (DEWS2005), 2005

[10] S .S. Chikkerur, "Online Fingerprint Verification System". M.Sc. Thesis. SUNY: Buffalo, NY, 2005