

FINGERPRINT SENSOR BASED ATTENDANCE SYSTEM USING ATMEGA 328 AND ESP8266

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Abstract:

Today students' (class) attendance became more important part for any organizations/institutions. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. This paper presents the manual students' attendance management into computerized system for convenience or data reliability. So, the system is developed by the integration of ubiquitous computing systems into classroom for managing the students' attendance using Fingerprint scanner. The system is designed to implement an attendance management system based on finger print scanner which students need to use their finger to success the attendance where only authentic student can be recorded the attendance during the class. This system takes attendance electronically with the help of the scanner, and the records the attendance in a database. Students' roll call percentages and their details are easily seen via Graphical User Interface (GUI). This system will have the required databases for students' attendance, teachers, subjects and students' details.

Keywords: *Finger print Reader, GUI, Database, Information geometry*

I. INTRODUCTION

Biometric system is becoming increasingly important, since they provide more reliable and efficient means of identity verification. The physical dimensions of a human finger contain information that is capable of authenticating the identity of an individual. 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 [10]. As common as it seems, such system lacks automation, where a number of problems may arise. This includes the time unnecessarily consumed by the students to find and sign their name on the attendance sheet; some students may mistakenly or purposely sign another student's name. Also, the attendance sheet may get misplaced [1].

As for system development and implementation, it should be able to help the lecturers to managing their student attendance systematically. The system must have database that contains student information and it must be able to help lecturer to manipulate data, update database, alert lecturers accordingly, and also nice interface to make it easier to use. Finally, the attendance system must be user friendly for commercial purpose. This system will focus on MTU regulation about attendance to class, and implement it to develop the system that will do all the attendance management automatically.

In this system the finger print recognition is also adopted to enable the process of identifying of student more reliable and secure for facilities management .Finger print based attendance management system was developed to provide a faster, more secure, and more

convenient method of user verification than passwords and tokens can provide for a reliable personal identification.

II. LITERATURE SURVEY

M.B. Srinidhi and R Roy [1] proposed the main purpose of this paper is to develop a safe and secure web based attendance monitoring system using Biometrics and Radio Frequency Identification (RFID) Technology based on multi-tier architecture, for both computers and smart phones. There is a functionality of automatic attendance performance graph in the system, which gives an idea of the student's consistency in attendance throughout the semester..

A. Jain, L. Hong, S. Pankanti, and R. Bolle [2] proposed the task of extracting knowledge from the given palm. They provide the identification method from fingers.

Sanchez-Reillo R., Sanchez-Avila C., Gonzalez-Marcos[3] proposed that how accurate our measurements can be with respect to resolution of the image taken. He proposed that hand biometrics have been developed by using different metrics

R.S. Reillo, C.S. Avila[4], in this paper he proposed hand features that are extracted from a color photograph taken when the user has placed his hand on a platform designed for such a task. Different pattern recognition techniques have been tested to be used in classification and/or verification from Euclidean distance to neural networks

Golfarelli, M., Maio, D., and Maltoni [5], described about the error trade-off in biometrics measures. He formulated the identity verification problem as a statistical pattern recognition problem and thus evolved a method for performance evaluation in biometric verification system.

R. P. Miller [9], described about the finger measurement, how accurately take it due to its different size. He had invented the first automatic hand geometry identification device purely based on mechanical means

D. G. Joshi, Y. V. Rao, S. Kar, Valli Kumar and R. Kumar [10], described about the finger crease pattern. Every individual have different type of creases on their finger as well as hand.

Comparative analysis of Literature survey is shown below in Table 1.

III. PROPOSED WORK

However, it is increasingly difficult for teachers or management to hold the full picture of attendance of student. In addition, how to motivate teachers to calculate each and every student's attendance using web app. There are some other challenges in the existing attendance system. In manual attendance system there are high probability of getting errors . In previous system, i.e.: in manual system, they do get accurate percentage of attendance of each and every student according to their convenience.

To motivate the teachers and the management to get accurate result of the attendance this system is been made.

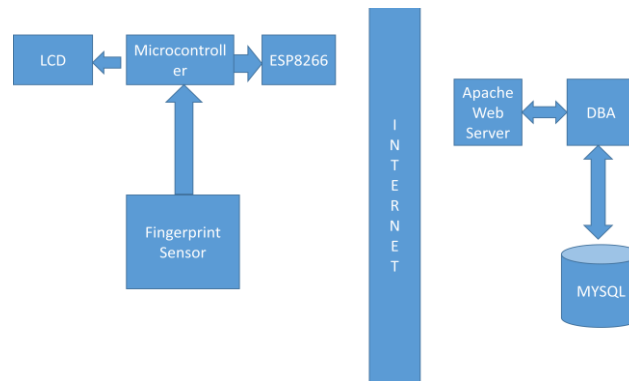


Fig.1: Proposed System

In the proposed system, we are developing a proper system that is easier for the college management. This system makes it much easier to calculate. We can predict less error and high efficiency. The student will keep his finger over the scanner. The scanner will take the photo of the finger and will check the picture in its database and if it matches then it will give presentee or else absent will be marked in front of that student. After this at the end of any class the subject teacher will be able to see the daily report of class on his/her mobile via mobile app. This will make the work of teacher very easy. If the teacher wants to see it in graph form then they can see that also. If any student have attendance less than 30% then both teacher and student both will get a warning alert on their phones and even if the student does not cover their attendance then direct the alert will go to their respective parent. In this we can make sure the student attend classes.

Table 1: Comparative Analysis

Sr. No	Author and Year	Techniques	Problems
1.	M.B. Srinidhi and R Roy.	RFID (Radio Frequency Identification Techniques)	1. Complex software design 2. Android application development difficult.
2.	A. Jain, L. Hong, S. Pankanti, and R. Bolle.	Touch print	1. Overlapping of prints. 2. Authentication problem.
3.	R.S. Reillo, C.S. Avila.	Euclidean distance	Not much secure.
4.	Sanchez-Reillo R., Sanchez-Avila C., Gonzalez-Marcos.	Geometric Algorithm.	1. High error rate.
5.	Golfarelli, M., Maio, D., and Maltoni.	Bayesian decision criterion.	Moderate error rate.
6.	HaSIS - A Hand Shape Identification System.	Geometric and Biometric method.	Takes the complete hand.
7.	R. P. Miller.	Finger Detection.	Problem to detect the finger.
8.	D. G. Joshi, Y. V. Rao, S. Kar, Valli Kumar and R. Kumar.	Computer-vision-based Approach to Personal Identification using Finger Crease Pattern	Detection of Crease pattern.

As per the management requirement the attendance can be fetched using web mining or mobile application that provide information of each and every student monthly, quarterly, yearly.

The Fig 1.1 shows, how the system will collect the attendance from different classes. Then categories that attendance as per the teacher choices. The categories contain the different options such as attendance monthly, quarterly or yearly. The system will notify the teacher about the student's attendance. We are developing the system with the following new features:

- a. Any teacher would be able to access any student's record.
- b. Any teacher would be able to create graph monthly or quarterly or yearly.

IV. CONCLUSION

In this paper, we discussed the way to measure the attendance of students. A preliminary experiment demonstrates a teacher can classify any student's attendance according to their use. Any teacher can take the records and generate graph according to their use.

In addition, for further case studies we can create an app so that teachers can see any student's attendance. There is no need to login in to the main system just by login will fetch the complete record. And if any student fails to maintain the required attendance then accordingly the teacher will get notification about that student.

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