Smart Location Based
Student Attendance Management System using Fingerprint Recognition

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Abstract: Participation has been widely used as a method to track students' academic behavior. But conventional approaches tend to be slow and imprecise. In this paper, we have proposed an automatic attendance detection system, where students can use smart phones to present their presences in parallel. The identity of a student is verified in collaboration with a fingerprint and position in real time. There are various forms of presence systems, such as the ERP system, RFID cards, and the biometric assistance system where fingerprints are considered the best and fastest method. In this system, we are monitoring the presence by matching the fingerprints and the position to improve the old method of recording presences. Replacing the tedious traditional form of assistance will save time, minimize administration workload and change paper and pen with digital devices.

Key words: Geo-fence, Fingerprint matching, GPS location, attendance management system.

I. INTRODUCTION

A. Background:

Assistance is to keep track of the number of students in schools, universities or any organization. It is very important to maintain discipline among the students of an institution and provide quality education in schools and universities, and if someone deviates from the required standards, appropriate action can be taken. The service collection process is heavy and therefore difficult to manage. Furthermore, this process takes a long time. However, it is necessary in schools and universities to maintain attendance. The method followed by the teacher or the teacher is to take participation in the sheet of paper and monitor the presence of students a day, so it is collected and combined as a monthly report. If a student has a frequency below certain specific criteria, this report will be used to decide whether or not a student must be stopped to take part in any examination. In this kind of cases, there should be a more efficient way to keep these records. A popular method is the biometric scanner .Different forms of assistance systems are available, such as the ERP system, the RFID cards, and the biometric assistance system in which the system using the fingerprint can be considered a quick and efficient method. It is safe to use, unique to every person and does not change in someone's life. In this system, fingerprint recognition is used as a solution for the student-based care management system.

B. Motivations:

The traditional way of keeping track of thousands of students is less efficient and time consuming. Thus, the main motivation of our system is to reduce human efforts and maintain accurate records.

C. Goal:

The goal of our system is to achieve better performance as well as robustness by designing a smart location based student attendance management system using fingerprint recognition.

D. Objective and Scope:

The Objective and Scope of system are,
- Teachers can manage attendance using computerized data management so that paperwork can be eliminated.
- Attendance will mark with no proxy within range of classroom; using geo fencing technique the range will be calculated.
- Generate attendance reports any which allows teachers to know student is eligible to attend the exams or not. Students as well as parents can track attendance effortlessly

II. RELATED WORK OR LITERATURE SURVEY

1. Apoorv, Raghav, and Puja Mathur (2016) have represents Smart attendance management using Bluetooth Low Energy and Android [1]. In most schools and universities in India, a minimum attendance requirement is present and the teacher manually records the attendance of the students present in the class. This wastes valuable time and energy.

There are various ways to automate the process of taking attendance such as fingerprint recognition, identity card scanner, Bluetooth sensors, bar code readers for identity cards and so on. This paper is aimed at implementing a Bluetooth low energy based attendance management system. It uses the Bluetooth Low Energy technology of beacons which communicate with an android application. The application is used to collect the data from the sensors and store it according to the dates. This provides a way for the teacher to instantly record and analyze the attendance of all the students. Methods of avoiding proxies or false attendances have also been incorporated.

2. Pansare, Dinesh, et al. (2016) has designed Review Of Fingerprint Based Attendance System With Daily Report To Parents Via Sms [2]. The paper provides the design method of portable fingerprint based attendance system using GSM. The system includes terminal fingerprint acquisition module and attendance module. It can realize automatically such functions as information acquisition of fingerprint, processing, and 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 mobile through GSM. Attendance system facilitates access to the attendance of a particular student in a particular case. This system eliminates the need for stationary materials and personnel for keeping of the records. To improve the accuracy of fingerprint identification system for implementation of large data bases for e.g.:- of an institute or a country etc. This paper have many new algorithms have been used by example gender estimation, key based one to many matching. Using these new algorithms, Developed an identification system which is faster in implementation than any other available today in the market. Although this fingerprint identification system for student identification purpose in this paper, the matching results are so good that it could perform very well on large data-bases.

3. Joshi, Rakhi, V. V. Shete, and S. B. Somani. (2015) has demonstrate Android Based Smart Learning and Attendance Management System [3]. An Education system in India has become so advanced in last decade due to the development of the technology. Smart class, video conferencing are some of the examples of modern trends in educational system. These applications help the institute to move forward quickly, fulfil their vision and accomplish their goals, E-way. The core idea of research project is to implement Android based application for attendance management system for advancement of institution and educational system. The proposed project will be implemented in applications such as online study material, notices, academic calendar and online reminders of examination, online attendance record, performance record, and parent intimation system using Android applications. This system helps teacher to take attendance through smartphone and keep record of students for their progressive assessment. This system gives a prior intimation to student as soon as their attendance goes below the specified attendance threshold in the form of an SMS.

4. Liew, Ken Nam. (2015) has represents Fingerprint Recognition Student Attendance Management System [4]. This project document aims at introducing the presentation phase of a system. There are four chapters introduced in this project documents which is introduction part, literature review part, proposed method/approach part, and conclusion part. This project is about to study on biometric technologies and develop a hybrid student attendance system that based on fingerprint recognition of student in order to verify their attendance. In this system, desktop-based attendance system will be developed for student to scan their fingerprint with provided hardware for a purpose to verify their attendance in all classes. At the same time, web-based attendance system will be developed for admin/lecturer to view and analyze student attendance by generate the attendance report. The main purpose to develop this project is to replace the current traditional attendance system by provide faster, accurate, and efficient system. With this new fingerprint recognition attendance system, it can eliminate some problems such as buddy signing, loss of attendance sheet, and control student skip class rate. In developing this project, evolutionary prototyping had been applied as methodology that guides the direction of whole project development. Besides that, few fact-finding methods are used to collect the data for analysis such as survey questionnaire methods, review journals method, and observation method. This project is planned to develop using Microsoft Visual Studio 2013, Structured Query Language (SQL) Server, GrFinger Software Development Kit (SDK), and Microsoft Fingerprint Reader. Other than that, system analysis and design technique is used to illustrate necessary diagrams for purpose to illustrate the whole system in more clear way. Lastly, the implementation of this system will definitely provide more efficient, reliable, and accurate way to manage the student attendance data.

5. Masalha and N. Hirzallah (2014) has presents A Students Attendance System Using QR Code. [5]. Smartphones are becoming more preferred companions to users than desktops or notebooks. Knowing that smartphones are most popular with users at the age around 26, using smartphones to speed up the process of taking attendance by university instructors would save lecturing time and hence enhance the educational process. This paper proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. The students will need to scan the code in order to confirm their attendance. The paper explains the high level implementation details of the proposed system. It also discusses how the system verifies student identity to eliminate false registrations.

6.   Mohammed, Abdul Aziz, and U. Jyothi Kameswari.(2013) has designed Web-server based student attendance system using RFID technology [6].Most educational institutions' administrators are concerned about student irregular attendance. Truancies can affect student overall academic performance. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. Therefore, computer based student attendance management system is required to assist the faculty and the lecturer for this time-provide much convenient method to take attendance, but some prerequisites has to be done before start using the program. Although the use of RFID systems in educational institutions is not new, it is intended to show how the use of it came to solve daily problems in our university. The system has been built using the web-based applications such as ASP.NET and IIS server to cater the recording and reporting of the students' attendances The system can be easily accessed by the lecturers via the web and most importantly, the reports can be generated in real-time processing, thus, providing valuable information about the students'.

7.   Verma, Pallavi, and Namit Gupta. (2013) has demonstrate Fingerprint based Student Attendance system using GSM [7]. In this paper provides the design method of portable fingerprint based student attendance system using GSM. 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 mobile through GSM. Attendance system facilitates access to the attendance of a particular student in a particular class. This system eliminates the need for stationary materials and personnel for the keeping of records.

8.   Rao, Seema, and K. J. Satoa. (2013) has published An attendance monitoring system using biometrics authentication [8].Biometric technology that involves the identification and verification of individuals by analyzing the human fingerprint characteristics has been widely used in various aspect of life for different purposes, most importantly as regards this study the issue of employee attendance. The main aim of this paper is to develop an accurate , fast and very efficient automatic attendance system using fingerprint verification technique. We propose a system in which fingerprint verification is done by using extraction of minutiae technique and the system that automates the whole process of taking attendance, The study was conducted using a quantitative approach by designing a questionnaire as the data collection instrument based on fingerprint matching biometric technologies

9.   O. Shoewu and O. A. Idowu,(2012) Development of Attendance Management System using Biometrics [9]. In this study Biometric Fingerprint Attendance Management System (BFAMS) was developed to monitor the non-academic staff of higher institution using the Federal Polytechnic, Ilaro as a case study. The system can further be applied in any other institution of learning. Biometric Fingerprint is one of the very successful aspects of biometric technology. Although the integration and use of biometric technology is getting simpler, quite a few institutions of learning have taken the advantage of this technology in Nigeria institutions. The implementation of this system will eradicate manual attendance taking, curb the problem of infringement and manipulation of staff attendance, create an avenue to make staff resume work early and also sign out at the stipulated closing time and to have a proper documentation   of   attendance   record   of   staff.

III.EXISTING SYSTEM AND DISADVANTAGES

The Existing system describes,

•   **Manual attendance System:** It is the ordinary technique of bringing assistance simply by naming students' names in class or by signing on paper. This system is inefficient because it can go wrong due to the manual work required and the maintenance of sheets of paper.

•   **RFID based attendance System:** The assistance system based on radiofrequency identification (RFID) is one of the solutions to solve this problem, but it takes a long time and is insecure. As specified above, the RFID will be used to detect assistance and maintain it automatically. This system uses a type of contactless reader and the cards used are passive. The disadvantage of this type of system is that anyone can bring one card from another to mark the presence of another

•   **Bluetooth Based Attendance System:** This is the attendance management system that uses low-power Bluetooth. For communication with the Android application, this system uses the low-energy Bluetooth signal. Data is collected using sensors and stored according to dates. The teacher can register the presence quickly and the analysis becomes easy.

•   **Bar Code Scanner Based Student Attendance System (SAS):** The purpose of this document is to replace the manual assistance system with barcode scanner technology. This system is more efficient and effective than other systems available for managing and recording assistance. Bar code technology has proved to be cheaper than RFID and biometric technologies. The systems mentioned above take time and are not safe. In the proposed project, an intelligent location-based assistance management system was designed using fingerprint recognition, which consumes less time, is safe and simple to implement.

Disadvantages:

- Time consuming process.
- Anyone can bring one card from another to mark the presence of another.
- Less security.
- Lots of paper work

IV. CONCLUSION

This project concerns the elimination of the disadvantages of the available system detected in the initial analysis. Systems keep students' attendance efficient and keep parents informed about their neighborhood. The system will eliminate the perforation of classmates (the student will unable to mark the dummy attendance). Fingerprint Attendance System is a profitable and simplified system that prefers the fingerprint as identification of an individual, since it is unique to each individual and cannot be shared or used incorrectly. Our system replace the tedious traditional form of assistance will save time, minimize administration workload and change paper and pen with digital devices.

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