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AUTOMATION SOFTWARE FOR STUDENT MONITORING SYSTEM

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Abstract - *Attendance was commonly used as a technique for tracking the academic behaviour of learners. Usually, however, standard methods are time consuming and incorrect. The updated attendance list will then be uploaded to an online database and can also be saved as a file for subsequent transfer to a PC. The proposed system enables learners to electronically monitor class attendance. The simulation uses distinct types of techniques to define the identity card of the student. The reader or sensor is connected to the attendance information system in order to save all attendance data directly to the database and can be used later to manage the information.*

Key Words: Attendance system, automation , accuracy, sensors.

1. INTRODUCTION

Attendance plays a key role in determining kids and young people's academic performance in schools and universities. Regular participation indicates that learners are less likely to participate in behavior that is delinquent or harmful. Chronic lack raises the danger of failure at college and early dropout. Manual maintenance of attendance are inefficient due to the following reasons:

It takes away a lot of lecture hours prone to proxies or impersonation. The aim of this research is to create a secure attendance recording scheme based on electronic attendance to monitor and analyse students existence. This system can obtain and store information to monitor attendance automatically. Teachers conduct a tiny handheld with a finger scanner and learners press their fingers to record attendance. Manual data entry can be avoided no proxy presence made. The main objective of this project is to monitor the attendance of students in lecture sessions and laboratory and others in a more effective way. A stricter approach especially to prevent students cheating about their attendance is additionally tedious, where a lecturer calls out the individual names from the students list and validate the presence of every single student. Such manual techniques have been demonstrated to be hard and time consuming to take student participation. Thus, a semi-automated system is needed to eliminate all these problems.

It is therefore our goal to create a mobile attendance scheme fitted with an internet database, in particular to stop data loss and to encourage paperless and a greener workplace. In addition, the application will assist decrease wasted time, resulting in increased teaching productivity in the classroom.

2. SERVEY OF METHODOLOGIES

2.1. Face Detection:

Face recognition idea for implementing a scheme that marks a specific person's participation by identifying and acknowledging the face [6].

The identification of the face is based on the following parameters:

A. Pose Estimation

There are three angles to determine the head pose: roll, yaw, pitch. Typically all these angles range from -90 to + 90. During face-log generation, the roll and pitch are adapted by aligning method, so our only problem is the yaw angle. The coordinates of the nose tip and also the point between the eyebrows using face detection landmarks. If there are such points (x1, y1) and (x2, y2), the yaw angle shall be calculated as:

yaw= abs(arctan 2(y2 − y1, x2 − x1)) (1)

B. Sharpness

Because the faces are moving, it is very probable to have blurry pictures in real-time video sequences. So it is essential to include this function in face quality evaluation. The variance of a Laplacian picture to calculate the sharpness of an picture.

Sharpness = (i,j)∈_(x,y) (_I(i, j) − _I)2 (2)

C. Image size or resolution

The position of the eye corners in a face using facial landmark detection. Let (xL, yL) be the left eye corner coordinates and (xR, yR) be the correct eye corner coordinates. The distance between them is as follows:

Resolution = sqrt((xL − xR)2 + (yL yR)2) (3)

The normalized the resolution acquired with the Euclidean distance limit as,

Normalized Resolution (NR) = Resolution / threshold (4)

D. Brightness

In real-time apps such as surveillance cameras, changes in lighting circumstances are quite prevalent. Local extraction of features on lighter faces is simpler to apply than on darker faces. This function must therefore be included in the face quality evaluation. We calculated the mean of all the intensities of different channels (R, G, B) current in the picture to achieve this parameter.

Brightness = (R + G + B)/3 (5)

These systems perform satisfactorily with different facial expressions, lighting and pose of the person. There is room for improvement since these systems sometimes fail to recognize every face student present in the classroom. This device portable for easy use even when the sessions are on, without disturbing the class.

2.2. Voiceprint:

It is the responsibility of the voiceprint recognition server to check the voiceprint of learners. Once a student wishes to register his presence in the school, his identity would be verified by the voiceprint coming. The captured speech clip and the stored voiceprint model of the student will be compared after the server gets a request for recognition to determine if they are from the same individual. If so, the message required for submission of additional participation will be returned to the client, otherwise the server will return a signal of failure of verification. As well as controlling the main logic of the attendance monitoring method, the attendance collection server gets the presence submission. The lecture-version app communicates with the server controlling the activity starting and ending, while the student-version app collects the server course list. All attendance documents are stored by the database server. Each record contains a number of required fields, such as student I d, course I d, and submission time. In addition, class-related information including lecture moment, place, and student list of this course is also stored in the database, which connects the attendance documents to the course, allowing the lecturer to access the data intuitively. The data presentation server offers access to the attendance information with all functionalities. The server shows its features as a web-based gateway. By interacting with the database, the server receives information about the classes and participation records of the learners, and then returns them to the web portal. In addition to presenting raw records, the portal has several built-in statistical methods, and results are displayed through interactive plots on the page. Finally, the portal could also export and download attendance information.

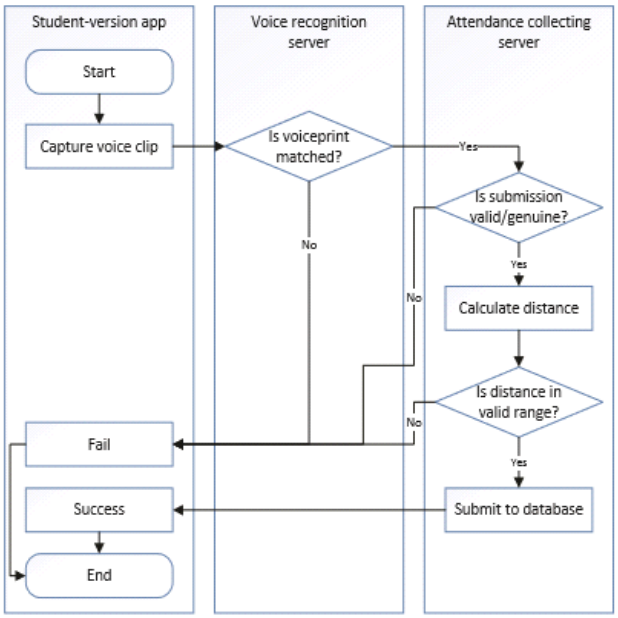


Fig. Voiceprint activity diagram

Radio Frequency Identification (RFID) is one of the wireless technology used as an identification to detect electromagnetic signals. For reading RFID tag information, the RFID reader is used. There are different frequencies for different distance that we can use respectively. Electromagnetic wave is used to transfer the unique data inside the tag to the reader.

The tag is activated by the electromagnetic wave, so that the unique data inside can be read by the RFID reader [8].

In this work, we have studied an automated attendance tracking system Students complete the attendance taking procedure on their smartphones in parallel. Collaboratively verification by integrating voiceprint biometrics with real time location could maximise the accuracy of the result collected by the system.

3.3. Android based system:

Developed attendance systems that need to be equipped with either a computer or RFID reader, leading in extra hardware costs and maintenance. Once mounted, this application can be used to download the list of learners from a specified internet server. The system will then function as a scanner based on the downloaded student list to scan each student card one by one to confirm and check the existence of the student. The camera of the device will be used as a sensor reading the barcode printed on the cards of the learners. The updated participation list will then be uploaded to an internet database and can also be saved as a file to be subsequently transmitted to a PC[5].

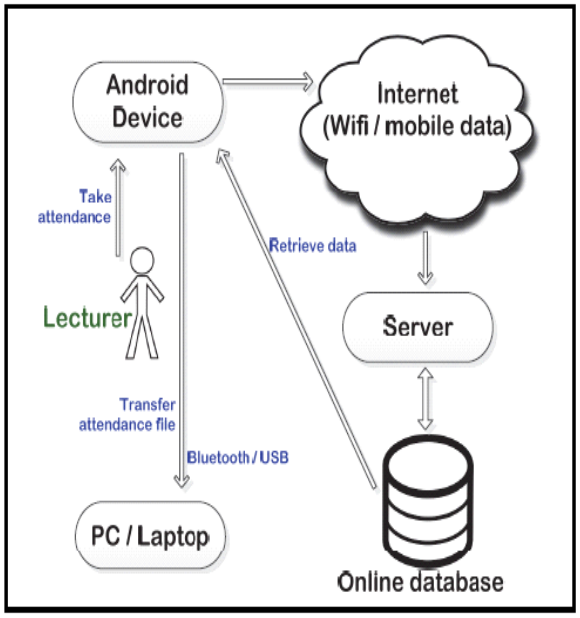


Fig. System architectural diagram

A. Hardware Architecture

A computer to run the internet database server and a camera device that supports Android 2.2 or greater versions to run the client application is the basic requirement to deploy the system. Another optional requirement for retrieving the attendance list file is a personal computer.

B. System Implementation

The project's development work comprises of two components, which are the internet database server development and the Android application itself. The design work involves designing the Graphical User Interface (GUI) required to display data, capture user inputs, and integrate with the Zxing barcode scanner, in particular to promote barcode scanning. This attendance management scheme utilizes the unique identification number of the student, which for attendance validation purposes is captured from the scanned barcode.

The ZXing library, which is incorporated into the implementation, supports the barcode scanning process.

Basic SQL understanding is required to build and manage the internet database. The internet server application being used is the Xampp server, one of the parts of which is the MySQL database.

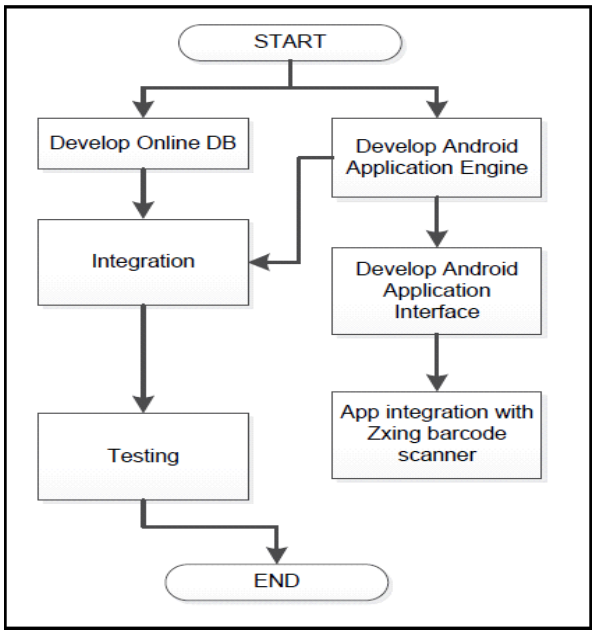


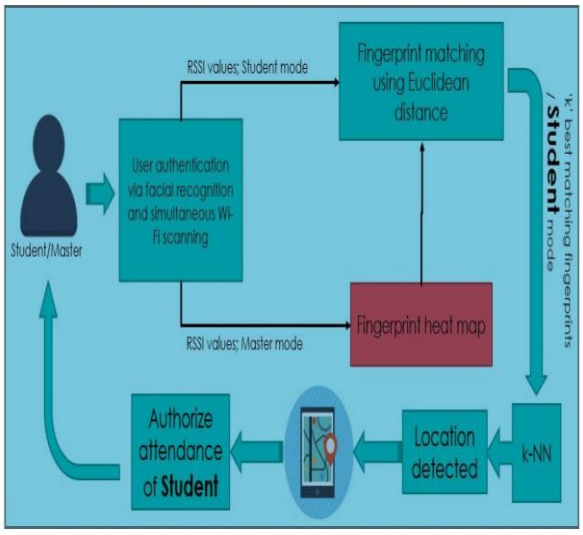
Fig . Flow of development activities

As for the client side, the SQLite library is used to manage a local database running on the Android device, i.e. used to store the student list downloaded and updated.

2.4. Fingerprint Sensor:

Automatic Finger Print Identification System (AFIS) compares fingerprints based on their ridge ending and bifurcation differences and similarities.

If the database is too big, the effectiveness will be reduced [3]. Biometric technology is an efficient instrument for identity verification and fraud detection. Using Microsoft Visual Basic Studio, students will be presented on a computer teacher with more attractive and graphics and embedded with the Fingerprint reader [4].



A. System Setup

The tool has been created an tested in smartphones on the Android platform. The user's identity is confirmed using the device's front camera face recognition. The instrument uses inertial sensors on the device to prompt the user to raise and hold the device at eye level (selfie style) to initiate the recognition of the face. The RSSI values have been stored on a server hosted by apache tomcat in a MySQL database.

B. Student mode

The student mode scans for RSSI values for the first time, similar to the admin mode. Using Euclidean distance from current fingerprints, the k-N algorithm is then used to discover the three finest fingerprint matches. The mean error in positioning is a direct result of the' k' magnitude. But one's' k' value results in higher peak errors[16]. We selected the'k' value to be three as it gave optimal results. From the coordinates of the three locations, an average coordinate is calculated and returned for authentication. If the coordinate is confirmed to be within the classroom, attendance will be approved. Otherwise, the student is prompted to try again.

3. ADVANTAGES

1. Compared with traditional paper-pen-signature technique for attendance maintenance, it proves much more reliable.

2. The automated request for attendance makes the on-campus attendance process simpler and more organized.

3. Would decrease the time wasted at the end of the session when verifying attendance, as the verification is fully automated.

4. The attendance method on campus became more effective, quick, paperless, and minimize the student's cheating process by using the attendance request based on electronic sensors.

4. CONCLUSIONS

In recording student participation, standard techniques are still being implemented in some schools where student names are called by teachers one by one or by each student's signature to determine their presence. There are also better techniques nowadays, i.e. relying on a scheme to record student attendance in a semi-auto way, for example. Systems based on RFID or biometrics. As a solution to current issues, such systems are totally outstanding, but one evident drawback is the extra hardware and maintenance costs.

Tracking the participation of learners in a class has always been a time consuming and complicated work. The system intended and deployed an automated tracking system for attendance in this job. Students finish the recognition process by taking the attendance.

There are no chances of proxies in the face recognition system, but due to some issues such as light density, brightness, camera, quality can not be monitored by some student participation. Even when the sessions are on, the mobile phone is simple to use without disturbing the class.

Collaborative verification by integrating voiceprint biometrics with real-time location could maximize the accuracy of the system's collected result, where several methods have been applied to protect privacy-sensitive biometrics data.it in noisy condition can't function correctly.

This scheme has shown that an inexpensive, quick and safe automated attendance marking scheme can be achieved in the classroom using a smartphone and Wi-Fi fingerprinting method incorporating a monitored RSSI procurement process and a straight forward k-NN algorithm.

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