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An Android Application for Attendance Using Geofencing

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Abstract: Students' participation should be recorded when school activities are taught in the classroom. The traditional method is to record statistics, which takes a lot of time and interferes with teaching activities in the classroom. It is clear that the engagement process for teaching activities such as social studies, online courses, and large lectures is not possible as an academic.

This article introduces mobile participation as a classroom-based learning environment. Students submit their attendance and address information through the Student Registration APP.

Teachers can set attendance locations to control whether students need to go to a designated location for attendance registration or remote registration registration.

Experimental results show that the system is flexible and intuitive, can save participation and analysis time, improve teaching performance, and meet information needs for participation in teaching activities.

Keywords: Location-based service, GPS, time and attendance system, sending SMS, android applications.

I. INTRODUCTION

Due to the rapid development of technology, in version 4.0, all business activities can be connected and accessed using the internet and mobile devices.

Time and attendance have also been expanded to make it easier for employees to use and monitor employees. Information about doing business with regional offices. The important thing is synchronization. Requirements that assume all employees can be in every branch.

A lot of time and involvement is taken up in the business, using tools such as machine recognition faces, QR codes and fingerprint scanners that need to replace each employee's attendance and biometric decisions. In the era of classroom teaching, the phenomenon of passing grades and learning has become more serious, and it has become difficult to guarantee students' interaction, cooperation and effective teaching.

For this reason, teachers often force their students to participate in class by recording their participation. In addition, course registration data is included in daily notes, supporting the transition from final evaluation to performance evaluation.

In classroom teaching, there are many examples between classes and between schools. More importantly, it is difficult to guarantee student interaction, participation, and teaching effectiveness. For this reason, teachers often force their students to participate in class by recording their participation.

In addition, lecture recordings are part of the regular grading system and support the transition from content analysis to systematic evaluation.

II. LITERATURE SURVEY

A. Multiple guarantees for safe mobile time and engagement – BYOD (Bring Your Own Device) models allow employees to use their mobile devices as revenue-generating tools for their daily activities while also spending time and engagement. Security of employee attendance is important to ensure that employees do not commit fraud when recording attendance and tracking work hours.

In this article, we want to connect fingerprints, secure Android ID and GPS as authentication, and add simulator protection and anti-crime protection to transform mobile attendance to secure mobile attendance.

B. Privacy - Ensure Class Attendance with Zero Effort - Tracking student attendance is an important process in education. We believe that automation can be achieved by using the technology available in the learning infrastructure and users' smartphones. Today, smartphones can receive various types of signals from the air using radio frequency technology (Wi-Fi, Bluetooth, mobile phones, etc.). Additionally, the smartphone receives information from the transmitter and can measure the received power.

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C. Intelligent Multiple Attendance System from One View - Attendance record is a function used in all schools to keep track of students at all levels every day.

The process of attending the signing ceremony is manual. These methods are accurate and do not harm participants, but they require time and effort for many students.

D. Unsupervised Students Use Bluetooth Smart Positioning Technology - The traditional registration system at Perak University of Technology Tapah Campus is still used by students. The method used is to record student attendance on attendance sheets; This is a poor way to track student participation. When talking among students absenteeism seems to be a big problem because it comes under the heading of grooming.

In recent years, some researchers have devoted themselves to improving the visitor experience. There are many forms of attendance tracking available today based on available technology. Text proposed wireless attendance management based on iris authentication. However, the system's CPU, buzzer, iris recognition module, LCD screen, etc. It needs additional equipment. A previous study also focused on monitoring participation and was conducted by. Researchers have developed a theory of listening based on facial recognition.

The system uses two different cameras to capture the student's seat and capture the student's face. Additional equipment puts a burden on the organization as it requires additional fees. Bluetooth is a standard protocol for sending and receiving data over a 2.4 GHz wireless connection. It is a short-range wireless communications system that allows devices such as mobile phones, computers, and other devices to transmit data or voice wirelessly over short distances. It is a secure protocol suitable for fast, low-power, low-cost wireless communication between electronic devices. The purpose of Bluetooth is to replace the cables that usually connect devices together while maintaining secure communication between devices. According to previous research, Bluetooth technology has many uses.

The technology allows users to register quickly. Administrators can effectively monitor attendance. One of the systems proposed by is co-participation based on Bluetooth smarts. Using Bluetooth smart technology, the system helps teachers monitor student attendance, prevent fake attendance and save attendance time. also developed a system that uses Bluetooth technology to save companies' budget and reduce the possibility of users accessing other people's cards. However, it requires additional hardware such as Raspberry Pi. It is used to store the user's Bluetooth address and information in the file.

III. MOTIVATION AND PROBLEM

1) *Effective Attendance Management:* Traditional attendance procedures (such as attendance) are time-consuming and error-prone. The location-based system automates the process, making it efficient and accurate.
2) *Real-time Monitoring:* Location-based systems provide real-time data on student attendance, allowing teachers to track and resolve attendance issues in a timely manner. This allows for timely intervention and increases overall participation.
3) *Effectiveness:* Students are more likely to attend classes regularly when they know their absences are properly tracked. This promotes accountability and encourages better participation.
4) *Parental Attendance:* Parents can understand their child's attendance in real-time or through regular reports. This encourages greater parental involvement and understanding of their child's academic performance.
5) *Data Analysis:* Participatory data can be analyzed to identify patterns and trends. Teachers and administrators can use this information to make attendance decisions. Be accurate and consistent in your participation. Increase employee productivity. Follow the organization's rules and regulations. Eliminate the risk of time theft and human error. Follow up to ensure employees are paid correctly. Employee records also provide important information about the productivity level and overall performance of the business. Many efforts have been made to provide a safe and reliable visiting or tracking system. The authentication algorithm of electronic devices can reach the system using two-factor authentication technology.

IV. OBJECTIVE

This prevents employees from being recognized as available and working regularly. Attendance tracking ensures employees are paid accurately. Employee engagement data also provides important information about productivity levels and the overall performance of the business. Attendance management keeps track of employees' working hours, check-in, check-out, vacation and vacation time to prevent employee time theft. Staff attendance can be managed in a variety of ways, from 15 hand-printed cards to biometric devices and attendance management.

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V. SYSTEM ARCHITECTURE

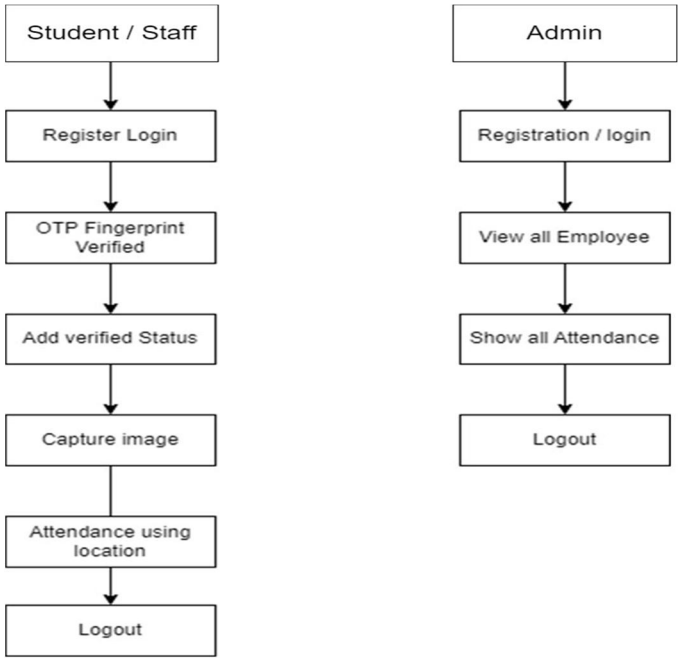

Fig: System Architecture of Attendance using Geofencing

VI. METHODOLOGY AND SCOPE

In this study, the authors adopted the spiral development method. Spiral pattern, also known as spiral pattern, is a type of alternation that combines the operation of the waterfall pattern with the natural pattern of the pattern. During prototyping, create process prototypes and present samples to users or customers to get feedback. Prepare to create the real product by adding and correcting the flaws of the previous model if it meets the needs of the user or customer. The model is also combined with the model created below where the top-down design creates the overall process first and then moves on to the details of the process and the difference is evident. This spiral model can be considered a standard model that can also be used for waterfall models and models due to the feedback from both connections, the combination of design and structure, the combination of top-to-bottom and bottom-to-top. Combination of two models. Top-down design is usually used for sequential waterfall models, while bottom-up design is usually used for structural models. Managers or HR team receive instant notification when an employee enters or leaves the protected area. This prevents employees from being recognized as available and working regularly. Attendance management system tracks daily attendance, working hours, breaks, sign-in and sign-out times. It prevents employees from wasting their time. Attendance management instantly integrates all attendance devices such as smart cards, biometric devices and facial recognition devices.

VII. PROPOSED WORK

In this work, we present a participation system based on the principle of facial recognition and authentication, which allows the system to recruit multiple participants with single feedback, thus improving the performance of the system when there is no place for a representative to participate. The system first captures the collective image of the entire class from the real-time video captured by CCTV, then detects the face using the Viola-Jones method, crops it and stores it in a separate folder, and finally recognizes the cropped image through deep learning. . . Model. Once approved, the participation is tagged and stored in the database. A detailed description of each step is given below. A. Image Capture The process is understood in both online and offline mode, for example, through live and recorded videos. In online mode, live video is received from cameras connected via IP address, while in offline mode, recorded video stored in the camera's memory is used in case of connection problems on the internet. B. After the recording passes through the system and the call starts, it is important to analyze the data for the training algorithm. The process is shown in Figure 4. To do this, we first interpret data containing students' facial images and other information. Facial images are captured via individual or group videos. In the video group, pictures of students' faces will be cut and stored in separate folders created according to their unique characters.

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But manually cropping each image in the group idea can be a bit tedious. That's why we add the second method. In the second method, a video featuring only one student is uploaded and many face images in different poses are cropped and stored in a folder. This method is easy and takes less time. In the next step, students' important information is stored in the database for participation. This information can be used to remind students to monitor attendance at any time. C. Sign Up From the user's perspective, the sign up process is very simple and complete. The participation process is shown in Figure 5. The whole process takes about 15 minutes after clicking the start button and finally the results are displayed and saved. In this step, upload the video to the program and capture the first frame. A search algorithm is used to identify students' faces, which are then cropped and stored in separate files. Background information algorithm is used to recognize cropped face by deep learning convolutional neural network model. Finally, the observed face was marked for participation. After the recognition process is completed, unrecognized faces that remain in the class will be marked as absent. Cropped faces stored in the middle step will be deleted to save memory. The program continues from one frame to the next and repeats 15 times, ensuring that all students present are identified if they are not caught in a frame photo. Finally, average attendance is calculated and students who exceed this percentage are marked as present, while remaining students are marked as absent. The report will be retained for future reference for all courses and disciplines, and all current students will be included in the API. At the end of the semester, teachers can monitor attendance via the attendance application.

VIII. CONCLUSIONS

In this study, we develop an intelligent single-output multiple fusion algorithm based on face recognition algorithm. This system eliminates the problems encountered when using traditional methods. Since this process takes a lot of time and requires everyone to access the system to mark their participation. In this project, we demonstrate an automatic face polling system that can be attended using a camera in front of the room, eliminating the above challenges, taking photos of entire classes in real time and learning to detect faces in photos. and crop the image, then compare it with the database. When a student is recognized, their award is marked. In order to improve the performance of the system, this process is repeated several times and the final results are saved in the Excel archive. This auto-engagement saves students valuable learning time because it runs in the background and does not require teacher or student interaction. The system also reduces manual work and burden on teachers, accurately marks attendance and improves safety. The closed system for teaching at the university should register students in university classes according to the first application scenario. Using attendance records, teachers can manage attendance records and information easily and flexibly. Now the production, student signatures are in place and the registration process can be controlled, it can be adapted to various teaching and learning contexts, it does not force the professional instructor to multitask, and it has great support and usability. This approach is user-friendly, increases classroom efficiency, and can reduce the time required to visit the classroom. As the main application, the school's classroom teaching record data is used according to the need to record the school's class attendance. This system can reduce the time it takes to leave the classroom, is easy to use, and can increase the efficiency of the classroom.

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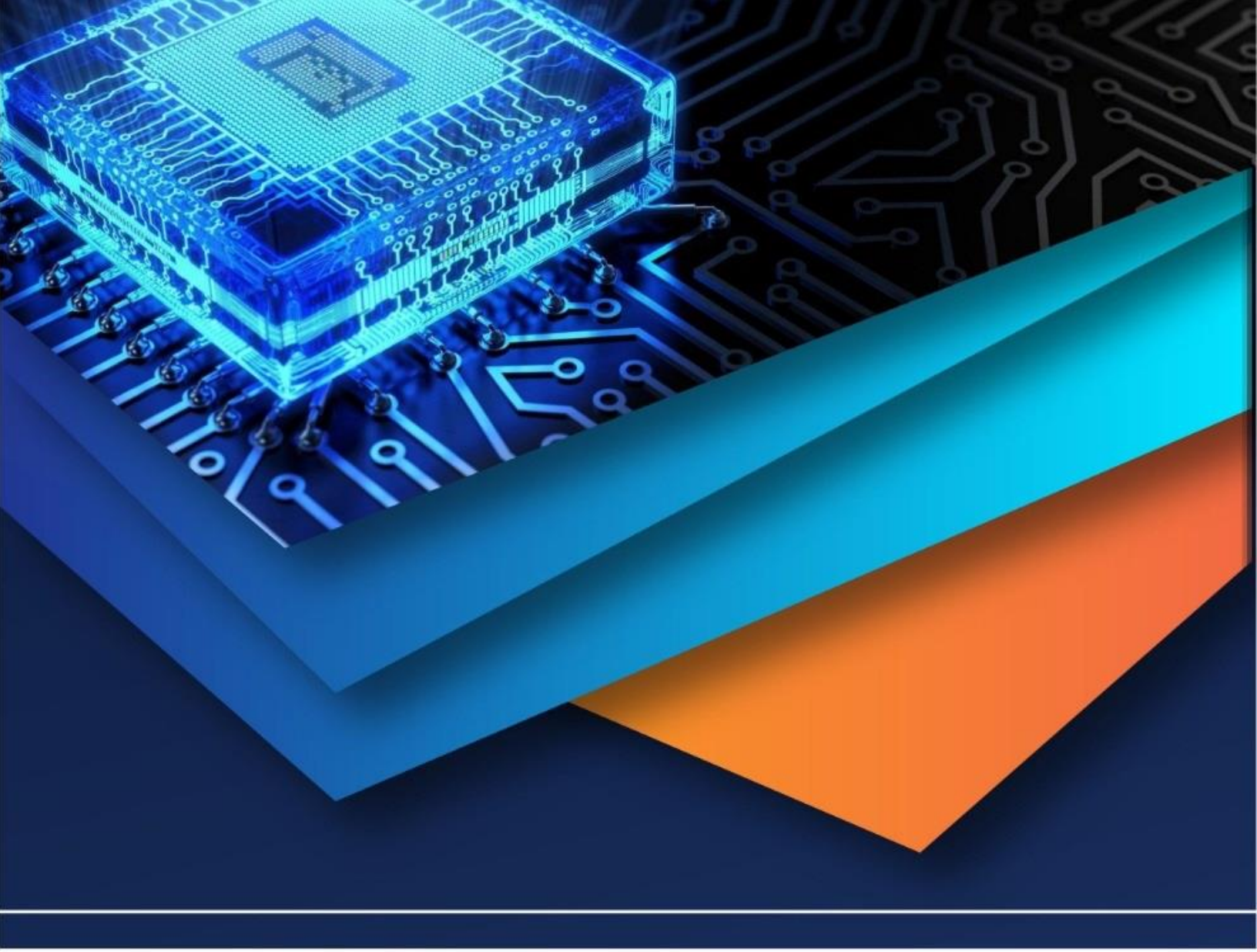

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