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FACE ATTENDANCE SYSTEM USING GPS TRACKING IN ANDROID APPLICATIONS

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ABSTRACT

The paper describes the system is a student attendance system that utilizes GPS tracking and multi-CNN (Convolutional Neural Network) technology for face attendance system . The system aims to simplify the attendance process for students and teachers while providing accurate and efficient attendance tracking. The system utilizes GPS tracking to determine the location of the student and confirm their presence in the classroom. The multi-CNN technology is used to enhance the accuracy of the attendance tracking. The multi-CNN system combines several CNN models to improve the accuracy of the attendance tracking process. The system also utilizes facial recognition technology to ensure that the correct student is marked as present. The system comprises of a mobile application for students and a web-based dashboard for teachers. The mobile application is used by students to check-in to their respective classes. The application uses GPS tracking to determine the student's location and confirms their attendance. The facial recognition technology ensures that the correct student is marked as present. The web-based dashboard is used by teachers to monitor attendance and track the students' attendance history. The dashboard displays a real-time attendance report, which shows the number of students present and absent in the class. The dashboard also allows teachers to view the attendance history of individual students and generate reports.

Keywords: Student attendance system, PS technology, face recognition, android

I.INTRODUCTION

In recent years, attendance tracking has become a critical issue in educational institutions. Traditional attendance tracking methods, such as manual entry and paper-based systems, are time-consuming and prone to errors. As a result, there is a growing need for automated attendance tracking systems that can simplify the process while ensuring accuracy and efficiency. In this context, the proposed student attendance system utilizing GPS tracking and multi-CNN technology is an innovative solution that addresses the shortcomings of traditional attendance tracking systems. The system utilizes GPS tracking to determine the student's location and confirm their presence in the classroom. The multi-CNN technology is used to enhance the accuracy of the attendance tracking process by combining several CNN models. The system also incorporates facial recognition technology to ensure that the correct student is marked as present. This technology has proven to be highly accurate and efficient in identifying students, eliminating the possibility of errors that may occur with manual attendance tracking systems. The comprises of a mobile application for students and a web-based dashboard for teachers. This setup enables real-time attendance tracking, which can be viewed by teachers, students, and parents alike. The system also allows teachers to view the attendance history of individual students, generate reports, and identify patterns in attendance. The proposed student attendance system utilizing GPS tracking and multi-CNN technology is an innovative solution that can simplify the attendance tracking process while ensuring accuracy and efficiency. The system's real-time reporting capabilities and user-

friendly interface make it an attractive option for educational institutions looking to streamline their attendance tracking process. The proposed system offers several benefits, including simplified attendance tracking for students and teachers, accurate attendance tracking, and real-time attendance reporting. The system also ensures that the attendance process is streamlined and efficient, reducing the workload for teachers. The proposed student attendance system that utilizes GPS tracking and multi-CNN technology is an innovative solution to simplify the attendance process for students and teachers. The system's accuracy and efficiency make it an attractive option for educational institutions looking to streamline their attendance tracking process.

II.FACE RECOGNITION

Face recognition is a biometric technology that uses computer algorithms to identify and authenticate individuals based on their facial features. It involves the use of software and artificial intelligence to analyse and compare images of faces to determine if they match. The process of face recognition involves several steps, including face detection, face alignment, feature extraction, and face matching.

- Face detection: The system detects the presence of a face in an image or video frame.
- Face alignment: The system aligns the face in the image to ensure that the facial features are in the correct position.
- Feature extraction: The system extracts specific facial features, such as the distance between the eyes, the shape of the nose, and the curvature of the lips, to create a unique digital signature.
- Face matching: The system compares the digital signature of the face to a database of stored digital signatures to identify the individual.

Face recognition technology has several applications, including security, law enforcement, marketing, healthcare, and social media. However, it is important to consider the ethical and privacy implications of face recognition technology, as well as potential biases and inaccuracies in the system. Privacy concerns have arisen regarding the use of face recognition technology, particularly in public spaces, as it can be used to track and monitor individuals without their consent. It is important to ensure that appropriate safeguards are in place to protect the privacy of individuals and prevent unauthorized access to the data. Additionally, potential biases and inaccuracies in the system can have significant ethical implications, particularly in diverse populations or when the images contain variations in pose, lighting, and expression.

III.LITERATURE SURVEY

1) Real-time online attendance method is helpful for workers who do a lot of activities outside the office or workers with multi-schedule. The attendance system using online biometric fingerprint system will reduce the problems caused by manual system usage such as lags in data management.

2) This research presents a way for constructing a comprehensive embedded class attendance system that integrates facial recognition with door access control. The system is based on Raspberry Pi that runs Raspbian (Linux) Operating System installed on micro SD card.

3) The presents the performance of a masked-faced recognition system that implemented SSD (Single Shot Detection) and ResNet feature extraction. The face recognition system application developed using Python and related libraries show a stable level of masked face recognition accuracy.

4) We propose a frequency calibration method to narrow the frequency search range of the acquisition of GPS satellites so that the GPS C/A signal can be tracked and decoded successfully. We create a GPS receiver based on SDR utilizing a low-cost PlutoSDR transceiver with a built-in low-accuracy oscillator.

5) The GPS on the smartphone will track the user's location and may be used to determine the location of attendance. The employee's cell phone's mobile phone number and Mac address will be registered in the system and become the employee ID.The usage of a smartphone is preferable to the use of an RFID or microchip on an ID card since the ID card is frequently left at the office, but the smartphone is constantly taken everywhere..

6) The usage of smartphones keeps increasing day by day and it is also can be used effectively to increase the

computational power and the security along with search and rescue. Several organizations rely on paper-based attendance records to keep track of attendance.

7) The existing method of recording attendance at universities is laborious and time consuming. I propose AttenFace, a stand-alone system that uses facial recognition to analyze, track, and give attendance in real time. The system detects students and stamps them as present in a class based on their presence in many photos obtained throughout the class length using snapshots of class from live camera feed.

8) The attendance maintaining system is difficult process if it is done manually. Smart and automated attendance systems for controlling attendance may be developed utilizing several biometric methods. Face recognition is one of them.

9) This paper presents six different filtering algorithms and their performances to evaluate the impact of target tracking module on GPS spoofing (Kalman Filter (KF), Reduced State Filter (RSF), Separate Covariance Filter (SCF), Autonomous Multiple Model (AMM), Generalized Pseudo Bayesian (GPB1 and GPB2), Interactive Multiple Model (IMM)).

10) Navigation was easier nowadays due to the advanced GPS system. Human activity relied on the GPS system in everyday life especially for traveling by car. The GPS signal loss caused by buildings blocking a GPS module from satellites was one concern with utilizing a GPS system in an urban location.

IV.EXISTING SYSTEM

Facial recognition as an identity authentication has been widely employed in inexpensive mobile systems. Yet, as assaults on face recognition algorithms become more common, mobile system users are becoming concerned about the security and dependability of face recognition modules in their mobile devices. Several commercial device makers in China choose to include a web-based API into their devices as a user authentication technique. We focus on the accuracy and reliability performance of the Baidu and Face++ face comparison APIs in this study. We also tested on Google Face net as a baseline for comparison. The results suggest that the liveness detection approach is not extensively used in web-based APIs. Individuals who do not have liveness detection are exposed to presentation attacks. Depending on the security level, the current liveness detection mechanism may be able to avoid a certain type of presentation attack.

We live in an age where everything is mechanised and linked online. Every day, the internet of things, image processing, and machine learning evolve. Several systems have been totally altered as a result of this evolution in order to produce more precise outcomes. The attendance system is a typical illustration of this shift, which began with a standard signature on a paper sheet and progressed to facial recognition. This study provides a way for constructing a fully embedded class attendance system that combines facial recognition with door access control. The system is based on the Raspberry Pi, which runs the Raspbian (Linux) operating system off a micro SD card. The Raspberry Pi is linked to a 5-inch screen as well as the Raspberry Pi Camera. By facing the camera, the picture is captured and sent to the Raspberry Pi, which is configured to handle facial recognition using the Local Binary Patterns algorithm LBPs. If the student's input image matches the trained dataset image, the prototype door will open using a Servo Motor, and the attendance data will be saved in a MySQL database. The database is linked to the Attendance Management System (AMS) web server, which makes attendance results available to any web browser with an internet connection. Using the dataset of 11 human photos, the algorithm achieves 95% accuracy.

DISADVANTAGE

- The systems can be expensive, especially if they require specialized hardware and software. This can make it difficult for smaller organizations with limited budgets to implement a GPS-based attendance system.
- The systems can be complex and require technical expertise to set up and maintain. This can be a challenge for organizations that do not have the necessary resources or expertise to manage the system effectively.

V.PROPOSED SYSTEM

The proposed student face attendance system using GPS tracking is an innovative solution to help schools and universities streamline their attendance tracking process. The system integrates facial recognition technology with GPS tracking to provide an efficient and accurate method for recording student attendance.

The system works by capturing an image of the student's face using a camera on a mobile device, such as a smartphone or tablet. The GPS tracking technology then records the location of the device, which is used to confirm the student's presence at a specific location, such as a classroom or lecture hall. The system automatically records the attendance record, which can be easily accessed by teachers and administrators. This proposed system has several advantages over traditional attendance systems, including improved accuracy, ease of use, and real-time tracking. By automating the attendance record keeping process, the proposed system can save time and reduce the risk of errors. Additionally, the system can provide valuable data on attendance patterns and trends, which can help schools and universities identify and address attendance issues. While there are some potential disadvantages to consider, such as privacy concerns and technical issues, appropriate safeguards can be put in place to mitigate these risks. With the right implementation and management, the proposed student face attendance system using GPS tracking can be a valuable tool for improving attendance tracking in schools and universities.

5.1 CONVOLUTIONAL NEURAL NETWORK

A Convolutional Neural Network (CNN) is a type of neural network commonly used for image classification tasks, such as face recognition. The first step is to collect a dataset of faces and prepare it for training the CNN model. This involves labelling the images with the corresponding names or IDs of the individuals in the images. Training the model: The CNN model is trained on the labelled dataset of face images. This involves feeding the images into the model and adjusting the weights of the network through back propagation to minimize the loss between the predicted and actual labels. Testing the model: The trained CNN model is tested on a separate dataset of face images that it has not seen before to evaluate its accuracy and generalization ability. The model is trained and tested, it can be used for face recognition. When a new image is presented to the model, it will output a prediction of the individual in the image based on the learned features of the faces in the training dataset. There are several variations of CNN models that can be used for face recognition, including the VGG16 and Inception architectures. These models typically involve a series of convolutional layers that extract features from the face images, followed by fully connected layers that make the final prediction. It is important to note that face recognition using CNN models can be susceptible to biases and inaccuracies, particularly in diverse populations or when the images contain variations in pose, lighting, and expression. It is important to consider ethical considerations and biases when developing and deploying face recognition systems.

5.2 GLOBAL POSITIONING SYSTEM (GPS)

GPS technology can be used in a face attendance system for students to ensure that the students are present in the right location when their attendance is being marked. A GPS module on the mobile device that is used to capture the facial data of the students. Develop an application that captures the facial data of the students and records their attendance. The GPS module with the application to track the location of the student when they mark their attendance. A location radius within which the student needs to be present to mark their attendance. When the student opens the application to mark their attendance, the GPS module will detect their location, and the application will check whether the student is present within the location radius. The student is present within the radius, their attendance will be marked, and the GPS coordinates will be recorded along with their facial data. If the student is not present within the radius, the attendance will not be marked, and the student will receive a notification asking them to come within the location radius to mark their attendance. The attendance records can be stored in a secure database, which can be accessed by authorized personnel. Using GPS technology in a face attendance system for students can help to eliminate the possibility of proxy attendance and ensure that the attendance records are accurate. However, it is important to ensure that the privacy of the students' personal information is protected, and that appropriate security measures are in place to prevent unauthorized access to the data.

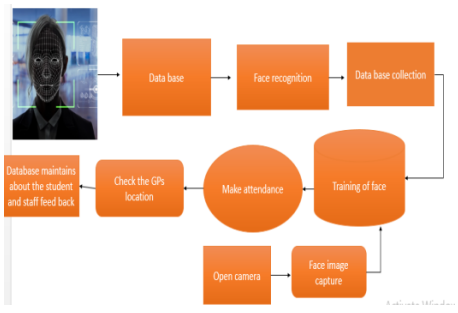
Develop a mobile application that can capture the user's facial data using the phone's camera. Integrate GPS technology to track the user's location and verify the user's attendance. The application should have a database to store the user's facial data and attendance records. When a student arrives at the school or university, they can open the application, and their location and facial data will be recorded. The system should check whether the student is within a specific range of the school or university before marking their attendance. The student is within the specified range and their facial data matches with the data stored in the database,

their attendance will be marked. The system can also send notifications to the student if their attendance is marked or if there is any discrepancy in the data. There are several benefits of using a face attendance system using GPS, such as eliminating the need for manual attendance, ensuring accurate attendance records, and reducing the chances of proxy attendance. However, the system should also consider data privacy and security concerns to protect the student's personal information.

5.2.1 ADVANTAGE

- With real-time tracking, the system can automatically notify students if they are marked absent. This helps students to be more responsible for their attendance and take corrective action if necessary.
- GPS tracking allows for real-time attendance tracking, meaning students can be marked present as soon as they arrive at the designated location. This helps to reduce the time and effort required for manual attendance tracking.
- GPS tracking can also enhance the safety of students as it can be used to track their location in case of an emergency.
- The automated attendance system can reduce the workload of teachers and administrative staff as they no longer have to manually record attendance. This can save time and resources, allowing them to focus on other important tasks.

5.3 SYSTEM ARCHITECTURE



5.5 FACE RECOGNITION

The capturing an image of the student's face using a camera on a mobile device and comparing it to a pre-existing database of student images. If the face =

5.4 DESCRIPTION:

A GPS-based face attendance system is a technology that uses GPS technology to track the location of an individual and facial recognition to identify the individual. It is commonly used in organizations and businesses to track

attendance and monitor the movements of their employees. This system typically involves employees checking in at specific locations via their smartphones, which are equipped with GPS and facial recognition capabilities. One of the advantages of a GPS-based face attendance system is that it can help eliminate fraud and errors associated with traditional attendance tracking methods, such as manual sign-ins or swipe cards. Additionally, it can provide real-time tracking of employee attendance, which can be helpful in managing employee schedules and workloads. However, there are also some concerns regarding privacy and data security associated with these systems. It is important for organizations to ensure that they have proper safeguards in place to protect employee data and to obtain informed consent from employees before implementing such a system. Overall, a GPS-based face attendance system can be an effective tool for managing employee attendance and monitoring employee movements, but it should be implemented with care and consideration for privacy. security concerns, recognized, the system confirms the student's identity and proceeds to the next step

VI.MODULE LIST

- Face recognition
- GPS tracking system
- Attendance recording maintance
- Graphical user interface

5.5.1 GPS TRACKING

The tracking the location of the device using GPS technology. The GPS coordinates are used to confirm the student's presence at a specific location, such as a classroom or lecture hall.

5.5.2 ATTENDANCE RECORDING

The attendance record once the student's face is recognized and their location is confirmed. The system can automatically update the attendance record and send alerts to teachers and administrators if a student is absent.

DATA MANAGEMENT

In storing and managing the attendance data generated by the system. The data can be easily accessed by teachers and administrators, and can be used to generate reports on attendance patterns and trends.

USER INTERFACE

The providing an interface for teachers and administrators to interact with the system. The interface can be designed to be user-friendly and easy to navigate, allowing teachers and administrators to access attendance records and generate reports with ease.

RESULT AND DISCUSSION

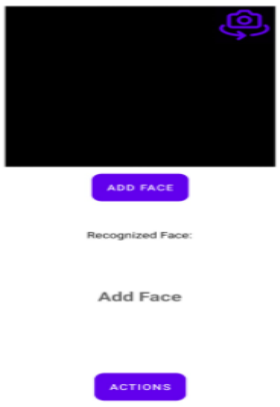


Figure: face recognition GUI module

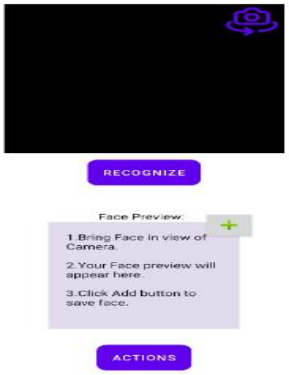


Figure: face attendance system module

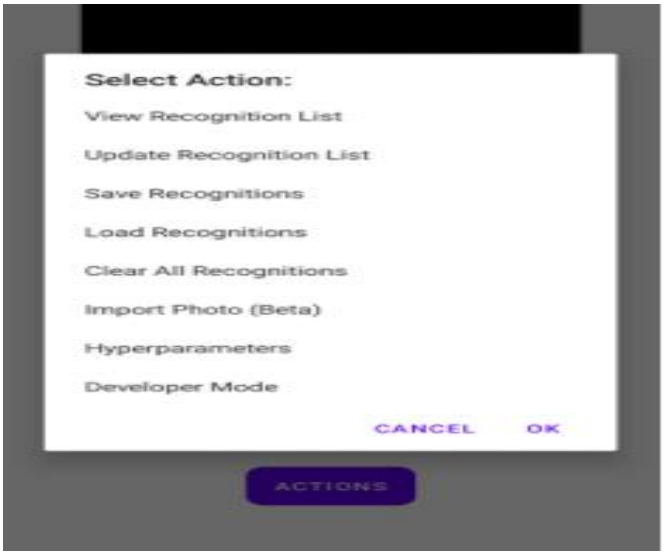


Figure: face recognition

VII.CONCLUSION

A Face Attendance System using GPS tracking system is a modern approach to attendance management that can improve accuracy, efficiency, and security in educational and corporate settings. The system uses facial recognition technology to authenticate individuals and GPS tracking to record their location and attendance in real-time. The system has several advantages over traditional attendance methods, including reducing the likelihood of fraudulent attendance, improving the speed and accuracy of attendance taking, and reducing administrative burdens for teachers and administrators. Additionally, the GPS tracking feature can be used to monitor the location of students or employees, which can be useful in emergency situations or for

tracking fieldwork. There are also potential ethical and privacy concerns associated with the use of facial recognition and GPS tracking technology. It is important to ensure that appropriate safeguards are in place to protect the privacy of individuals and prevent unauthorized access to the data. A Face Attendance System using GPS tracking system can be a valuable tool for attendance management in educational and corporate settings. However, it is important to carefully consider the potential benefits and drawbacks of the system, and to implement appropriate safeguards to ensure that it is used in an ethical and responsible manner.

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