Face Recognition Based Smart Attendance System

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ABSTRACT: Recent advances in the performance of automatic face recognition (AFR) systems have made them widely applicable for a variety of security and commercial applications. An Human facial recognition is utilised in real time by corporations to keep track of employee attendance. So Face recognition in real time for smart attendance is a practical use. Managing staff on a daily basis necessitates a system like this. Real-time image background subtraction is still a problem, making this a difficult operation. Real-time recognition of a human face. both basic and fast methods are put to use An analysis method known as Principal Component Analysis (PCA) has been employed to Recognize the faces that were detected with a high degree of accuracy. The coordinated The face of the employee is used to track their attendance. Our technology automatically keeps track of employee attendance. Manual Data entry into logbooks becomes time consuming and complex. the time span Because of this, we were able to design a useful module that includes a face Recognition is used to keep track of employee attendance. Our There is a module in which the employee's face is included. Once you've completed the enrollment form, you're done. The database will have a photo of them. As part of the application procedure, We need a system because this is a one-time event. Having fun is something you can do. roll number, which will be your own employee id. every every worker The presence of each employee will be regularly updated. database. Manual performance was shown to be inferior when compared to automatic performance. Tracking system for people's presence. The time an employee spends at work is recorded after they have been identified. There are a lot more choices with this product. With this approach, correct results are provided in a user-interactive manner, as opposed to traditional systems for managing attendance and leave.

KEYWORDS: haar cascade, Preprocessing, Feature Extraction.

I. INTRODUCTION

In all institutions, tracking employee attendance is critical for evaluating staff performance. Thus, each university takes a unique strategy. Others take attendance automatically utilising biometric technologies, while others take attendance manually using outmoded paper or file-based methods. On the other hand, employees entering the office through these routes will have to wait an extended period of time to form a line. While several biometric authentication methods are available, the most critical ones are universal. Enrolment in any biometric system begins with the capture and storing of an individual's unique biometric attributes in a database, followed by identification and verification procedures. These two procedures compare a person's biometric feature to a template that was previously stored at the time of enrolment. Biometric templates include fingerprints, the iris of the eye, the face, the geometry of the hand, the signature, stride, and voice. When employees enter and exit the workplace, our system utilises face recognition technology to maintain a record of who is in and who is out without requiring human intervention. When face recognition software is used, two processes are involved: first, photos are scanned for potentially recognised faces, and then those faces are compared to a database. The Ada Boost, Float Boost, S-Ada Boost, Support Vector Machines (SVM), and Bayes classifier are all face recognition methods. The rapid face detection technique can be used to improve the accuracy of face recognition.

SURF is the most successful approach. This technique was used by our system to identify individuals in an image of an office environment. At times, the use of facial recognition software is useful. There are two basic divisions in terms of divisions. When texture features are applied to the entire face or to specified parts, the term "appearance-based" is used. When texture features are applied to particular regions, the term "appearance-based" is used. When applied to Feature-based, texture features are based on geometric features such as the mouth, nose, eyes, and eye brows, as well as their relationships. Face templates were constructed using statistics such as Linear Discriminate Analysis (LDA), Principal Component Analysis (PCA), Kernel Methods, and Neural Networks, as well as Eigen-faces.

II.   MOTIVATION

- The attendance management system is observed on a daily basis.
- Workload and time consumption are calculated.
- The flaws in the current system are identified.

III.   LITERATURE SURVEY

Md. Sajid Akbar, Pronob Sarker, Ahmad Tamim Mansoor.," Face Recognition and RFID Verified Attendance System"[1], :For academic institutions to disseminate and assure quality education to all students, proper attendance management is critical. This study proposes a concept of an automated attendance system that eliminates the need for manual data entry, reducing the risk of fraud. Face recognition combined with Radio Frequency Identification (RFID) is used in this concept to recognise and count authorised students as they enter and exit the classroom. Smart Attendance System maintains an accurate record of every registered student and considerably reduces the time-consuming activity. Furthermore, this intelligent system maintains the data of every student enrolled in a specific course in the attendance record and provides required information as needed. The constraints of the present manual attendance system are substantially overcome in our project by identifying the individual's face and verifying it with RFID at the same time. Another benefit of the concept is that it saves energy by adopting an IR-based system that only turns on the room's electronics when there are people inside.

Lin Zhi-heng*, Li Yong-zhen , "Design and Implementation of Classroom Attendance System Based on Video Face Recognition"[2], The importance of classroom attendance cannot be overstated when it comes to classroom teaching. It is possible to successfully supervise students who regularly attend class to ensure that they arrive on time and that the classroom education is of a high standard. However, students are currently able to attend class without missing many days. An further example of how classroom time will be squandered is when the teacher uses profanity when speaking to students.   time. This research makes use of video face recognition to keep tabs on classroom attendance. The system collects data through the use of an in-class camera.   knowledge obtained by the usage of a video project in the school Video data is first separated into two categories: pictures yielded an empty picture frame for still shots, as well as multiple portraits of people with clearly visible faces.   Face recognition is improved with the use of a superior camera and lighting.   are added together and totaled. Integration with platform control is possible to solve camera placement's impact on recognition results.   system for rotating and focusing a camera on a platform improve the recognition's accuracy even further.

Refik Samet, Muhammed Tanriverdi," Face Recognition-Based Mobile Automatic Classroom Attendance Management System"[3], The attendance check in the classroom is an important aspect in student participation and overall course achievement. Taking attendance by calling names or passing around an attendance sheet takes time, and the latter is especially vulnerable to fraud. RFID, Bluetooth, fingerprint, iris, and facial recognition-based technologies have all been researched and developed as alternatives. Although these technologies have some advantages, the main downside is the high cost of system installation. The goal of this study is to offer a facial recognition-based mobile automatic classroom attendance management system that doesn't require any additional hardware. Face recognition has been established using a filtering system based on Euclidean distances derived by three face recognition approaches, namely Eigenfaces, Fisherfaces, and Local Binary Pattern. Three different mobile applications for teachers, students, and

parents to install on their smart phones to manage and perform the real-time attendance-taking process are included in the proposed system. The proposed system was put to the test among students at Ankara University, and the results were extremely positive.

:Priyanka Wagh, Jagruti Chaudhari, Roshani Thakare, Shweta Patil,“ Attendance System based on Face Recognition using Eigen face and peA Algorithms”[4], Attendance can be difficult to keep track of manually. A smart and automated attendance system for managing attendance can be developed using a variety of biometrics. Face recognition is one of them. This strategy can be used to combat issues like fake attendance and proxies. Light intensity and head posture difficulties plagued the previous face recognition-based attendance system. Methods like illumination invariant, Viola and Jones method, and Principle component analysis are used to deal with these problems. In this system, the most critical functions are face detection and recognition. After that, the discovered faces can be compared to the student face database. This innovative method will make it easier to monitor student attendance and other important data.

Edy Winarno, Imam Husni Al Amin, Herny Februariyanti,Attendance System Based on Face Recognition System Using CNNPCA Method and Real-time Camera”[5], The study of human face recognition is a relatively recent development in computer vision. A human face recognition system can be used in a variety of applications, one of which is an attendance system. The attendance system identifies and recognises faces as a person's identification, which is then stored in a face database. Face identification of the camera-captured object faces is achieved by comparing the camera-captured face image data to the face photos stored in the face database. CNN-PCA was employed in this study as the hybrid feature extraction method for the facial recognition-based attendance system (Convolutional Neural Network - Principal Component Analysis). Combining these strategies results in a more precise feature extraction method. The face recognition-based attendance system built into this camera is incredibly effective and efficient at increasing the accuracy of user data. The facial recognition-based attendance system on this camera is extremely accurate and precise, resulting in a system that is both trustworthy and powerful in real-time face recognition.
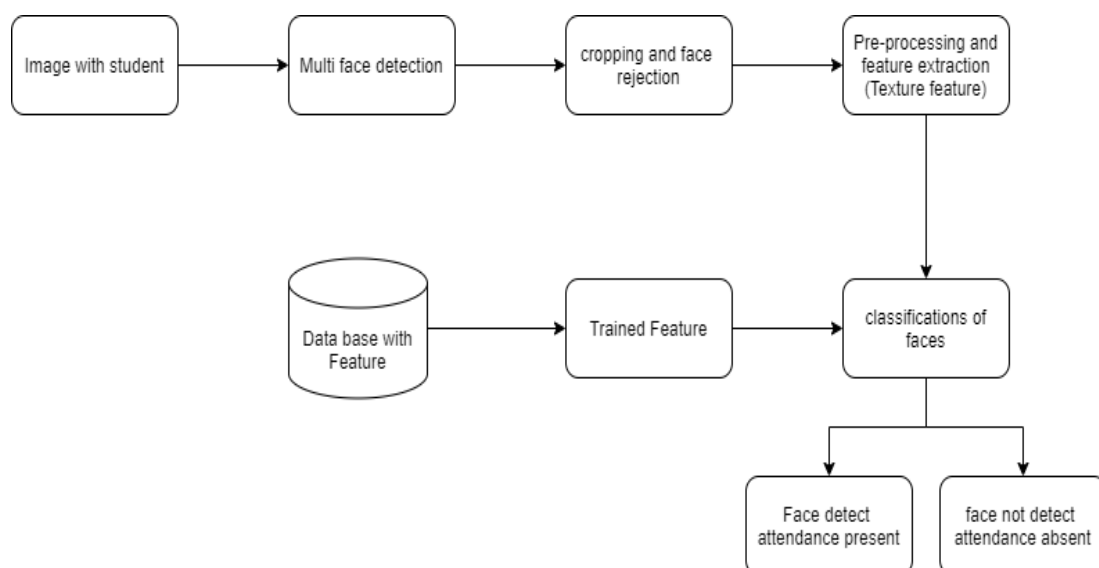
IV. SYSTEM ARCHITECTURE

Fig. system architecture

V.   ALGORITHM

Haar Cascade Algorithm:-Haar Cascade is a machine learning-based strategy that involves training the classifier using a large number of positive and negative images. Positive images - These photos contain the images that our classifier is supposed to recognise. Negative Images - Images of everything else that isn't the object we're looking for.

VI.   CONCLUSION

The Automated Attendance System was created with the goal of lowering the number of errors that occur in traditional (manual) attendance systems. The goal is to automate and create a system that will benefit an organization like an institute. In the office, the most efficient and precise technique of attendance that can replace the old manual methods. This method is secure, dependable, and readily available. At order to implement the system in the office, no specialist hardware is required. It can be made with a camera and a computer.

VII.   REFERENCES

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