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Student High Definition Monitoring Face Recognition Smart Attendance System

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ABSTRACT

Today's educational institutions are worried about students' consistent performance. The insufficient attendance is one factor contributing to the decline in student performance. The most popular techniques to record your attendance are to sign or call the pupils. It was problematic and took longer. A computer-based student attendance monitoring system that enables the teacher to maintain attendance records is now essential. In this project, we used an intelligent attendance system based on face recognition.In this project involves students facial recognition smart attendance system .it is different from traditional old way of marking attendance instead of giving decay time for attendance we can use this method to saving paper work and time of teacher and students not worry about to missing their Attendance rather a calling their roll no one by one just time taking process. In this project attendance automatically taken and automatically mark on Excel sheet. And also student database and teacher database also include to help teachers to categorize the attendance subjectwise (accordingly their subject).and teacher database help teacher to login and logout with their respective subject and teacher have proper access this platform.

Keywords: Face Recognition, LBPH (Local Binary PatternHistogram) Algorithm, Haar Cascade Algorithm.

I. INTRODUCTION

Every organization requires a robust and stable system to record the attendance of their students. and every organization have their own method to do so, some are taking attendance manually with a sheet of paper by calling their names during lecture hours and some have adopted biometrics system such as fingerprint, RFID card reader, Iris system to mark the attendance. The conventional method of calling the names of students manually is time consuming event.

The RFID card system, each student assigns a card with their corresponding identity but there is chance of card loss or unauthorized person may misuse the card for fake attendance. While in other biometrics such as finger print, iris or voice recognition, they all have their own flaws and also they are not 100% accurate. Use of face recognition for the purpose of attendance marking is the smart way of attendance management system. Face recognition is more accurate and faster technique among other techniques and reduces chance of proxy attendance.

Face recognition provide passive identification that is a person which is to be identified does not to need to take any action for its identity. Face recognition involves two steps, first step involves the detection of faces and second step consist of identification of those detected face images with the existing database. There are number of face detection and recognition methods introduced. Face recognition works either in form of appearance based which covers the features of whole face or feature based which covers the geometricfeature like eyes, nose, eye brows, and cheeks to recognize the face..

II. LITERATURE SURVEY

[1] According to Harsh Kumar, NishantBhati, PiyushBharadwaj, PratyushChoudhary, Ms.Akansha Sharma "Real Time Face Attendance System Using Face Recognition"2023 The technique used to solve the problem of inefficient and inaccurate attendance systems is the implementation of a real timeface recognition attendance system using deep learning algorithms. This system utilizes deep learning models, such as MobileFaceNet,for face detection and recognition. The face detection is performed using the ultra-light face detector model , while the face recognition is achieved using the MobileFaceNet.

[2] According to RohiniVhatkar, AnasShaikh, QadriHasan, Prof. Dinesh Deore. "Attendance Management System Using Face Recognition."2023 The technique used to solve the existing problem of attendance management is the development of an Attendance Management System using Machine Learning specifically face recognition technology.This system automates the attendance process by using biometric techniques to detect and recognize faces.

[3] According PayalPatil, Prof. Dr. S. Shinde, "Comparative analysis of facial recognition models using video for real time attendance monitoring system"2020Attendance reporting is one of the standard processes across the world in academic institutions. The key purpose is to encourage consistency in attending school which in turn improves the learning process for a student. The manual attendance system is widely used in the educational system which is time-consuming as well as laborious. The main concept behind the automatic attendance system is to apply facial recognition effortlessly compared to other biometric systems.

[4] According to Maria Ali, Hafiz UsmanZahoor, Ans Ali. "Smart Multiple Attendance System through Single Image" 2020In this system, a group image is captured from a high-resolution camera mounted at a fixed location to capture the group image for all the students sitting in a classroom. Next, the face images are extracted from the group image using a popular Viola-Jones algorithm followed by recognition using a convolutional neural network trained on the face database of students. We tested our system for different types of group images and types of databases.LPR in modern transport systems identifies vehicles via computer vision. Our novel SR algorithm improves license plate legibility in traffic videos.[11]

[5] According to DrArunaBhat, ShivamRustagi, Shivi R Purwaha, ShubhangSinghal, "Deep-learning based group photo Attendance System using One Shot Learning",2020face recognition-based attendance system which can work with group photo of a class providing us a list of present students. It uses one shot learning based face recognition technique for our system which can work for new users by providing only a single image of them thus making the system very robust and efficient. The proposed work presents a fully functional android app and backend system architecture which can easily be utilized by any university or school without requiring any expensive infrastructure setup.

[6] According Naman Gupta, Purushottam Sharma, Vikas Deep, Vinod Kumar Shukla,"Automated Attendance System Using OpenCV"The technique used to solve the problem of inefficient and inaccurate manual atten- dance systems is image process- ing, specifically face recognition. This tech- nique involves capturing and analyzing im- ages of students' faces to accu- rately detect and mark their attendance.

[7] According to SoumitraChowdhury, SudiptaNath,AshimDey and Annesha Das."Development of an Automatic Class Attendance System using CNN-based Face Recognition",2020 This paper represents the development of a face recognition based automatic student attendance system using Convolutional Neural Networks which includes data entry, dataset training, face recognition and attendance entry. The system can detect and recognize multiple person's face from video stream and automatically record daily attendance.

[8] According to SamridhiDev, TusharPatnaik, "Student Attendance System using Face Recognition", 2020 The technique used to solve the existing problem of efficient and accurate attendance management in educational institutions is the implementation of a realtime attendance system. This system utilizes algorithms such as K-nearest neighbor (KNN),convolutional neural networks (CNN),and support vec- tor machine (SVM) for face recognition and attendance marking.

[9] According to ArjunRaj.A, Arvind K, Chethan KS, Mohammed Soheb,"Face recognition based smart attendance system"2020 The image is enhanced using histogram equalization and inputted into face detection algorithms like Deep Neural Network (DNN). The LBPH Algorithm is used to recognize students' faces, cropping them for features like eye distance and nose distance. Students are marked present or absent based on these features, and their identification is recorded in a database.

[10] According toRadhikaC.Damale,Prof.Bageshree.V.Pathak"Face Recognition Based Attendance System Using Machine Learning Algorithms, 2018 paper proposes a face recognition system using machine learning algorithms such as SVM, MLP and CNN.The system achieves good accuracy on a self-generated database but suggests improvements like using a better quality webcam and expanding the dataset for better real-time performance.

Lots of IOT based technologies are used for advancement of safe, secure and smart travelling through monitoring [12].

Image enhancement as an activity of revamping standards of input image for better understanding of the future viewers. Image enhancement is said to upgrade the information content of the image & modifies the visual effect of the image on the watcher. The characteristics of the image are observed to be intensified by the process of image enhancement [13].

In this paper, we have prepared new system after identifying issues in existing manual system. In which easy to use GUI is proposed by which Student, Faculty can view all records which are necessary. The faculty can upload the events when admin allows that event then it displays on screen. Admin and Principles also uploads the

event. Thus we will implement Centrally College Event Management System to address the problem faced by the event organizers with respect to communication and working methods [14].
For safe, secure and smart transport now a day's IOT based smart technologies are used. It can be implemented for taking attendance also[15].

III.LIMITATIONS OF EXISTING SYSTEM

A lot of work has been done in this field thanks to its extensive use and applications. This section mentions some of the approaches that have been implemented to achieve the same purpose. These works are mainly differentiated from the techniques for face recognition system.
The use of facial data raises privacy issues and may infringe on individuals' rights, leading to concerns about data security and misuse. Face recognition systems can struggle with variations in lighting conditions and facial poses, reducing their accuracy in real-world environments. Implementing these systems on a large scale can be complex and costly, requiring significant hardware and infrastructure. Face recognition systems are susceptible to spoofing attacks, where a photo or video of an authorized person can be used to gain access. High computational and memory requirements can limit the practicality of deploying face recognition systems on resource-constrained devices.

IV.CONCLUSION

The problems with the current manual systems are addressed by the smart attendance management system. To improve the system and mark each student's attendance, we applied the facial recognition approach. The device functions admirably in various positions and variants. Future improvements to this system are required because it occasionally struggles to identify pupils at a distance. Additionally, there are certain processing limitations, so using a system with more processing power may help this system perform even better.

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