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Attendance Management System using Face Recognition

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ABSTRACT: Face recognition systems are used in practically every industry in this digital age. One of the most widely utilised biometrics is face recognition. It can be used for security, authentication, and identity, among other things. Despite its low accuracy when compared to iris and fingerprint identification, it is commonly employed because of its non-invasive and contactless approach. Face recognition systems can also be used to track attendance in schools, colleges, and companies. This system intends to provide a facial recognition-based class attendance system, as the existing manual approach is time consuming and difficult to maintain. There's also the possibility of proxy attendance. As a result, the demand for this system grows. Database construction, face detection, face recognition, and attendance updating are the four steps of this system. The photos of the kids in class are used to generate the database. The Haar-Cascade classifier and the Local Binary Pattern Histogram technique are used to detect and recognise faces. Faces are discovered and recognised from the classroom's live streaming footage. At the end of the session, attendance will be mailed to the appropriate faculty.

KEYWORDS: Face recognition, NFC, camera, Infrared, face, and face dataset, attendance management system

I. INTRODUCTION

In many schools and universities, the traditional system of attendance marking is a time-consuming task. It also adds to the workload of professors, who must physically call students' names to record attendance, which can take up to 5 minutes per session. This will take some time. There is a possibility of proxy attendance. As a result, several institutes began using various methods for documenting attendance, such as radio frequency identification (RFID) [3], iris recognition [4], fingerprint recognition, and so forth. These methods, on the other hand, are queue-based, which might take longer and be obtrusive. Face recognition has established itself as an important biometric characteristic that is both simple to acquire and non-intrusive. Face recognition systems are mostly unaffected by diverse face expressions. There are two types of face recognition systems: verification and face identification. Face verification is a 1:1 matching procedure that compares a face image to a template face image, whereas face verification is a 1:N problem that compares a query face image to a template face image [1].

The goal of this system is to create an attendance system that uses face recognition technology. For attendance purposes, an individual's face will be evaluated. Face recognition is becoming more common and widely utilised these days. We proposed a system in this work that recognises students' faces from live streaming video of the classroom and marks attendance if the detected face is located in the database. When compared to existing procedures, this new system will take less time.

II. LITERATURE REVIEW

The authors of [3] suggested an automatic attendance system paradigm. The model examines how face recognition combined with Radio Frequency Identification (RFID) detects and counts permitted pupils as they enter and exit the classroom. Every registered student's legitimate record is kept in the system. The system also keeps track of every student enrolled in a specific course in the attendance record and offers relevant information as needed. The authors of this paper [4] created and implemented an iris biometric attendance system. The attendees were initially requested to register their information as well as their unique iris template. At the time of attendance, the system took class attendance automatically by collecting each attendee's eye image, detecting their iris, and checking the database for a match. The prototype was a web-based application.

The authors of [5] proposed a facial recognition-based attendance system. The system was created using Viola- Jones and Histogram of Oriented Gradients (HOG) features, as well as a Support Vector Machine (SVM) classifier. The authors evaluated various real-time conditions such as scale, illumination, occlusions, and position. The quantitative study was carried out using the MATLAB GUI and the Peak Signal to Noise Ratio (PSNR) data. The authors of [6] compared the Receiver Operating Characteristics (ROC) curve to find the best facial recognition algorithm (Eigenface and Fisherface) offered by the Open CV 2.4.8 and then integrated it in the attendance system. Based on the results of the studies in this study, the ROC curve shows that Eigenface outperforms Fisherface. The system, which used the Eigenface algorithm, obtained a 70-90 percent accuracy rate. The authors of [7] proposed a method for a student attendance system in the classroom that included Discrete Wavelet Transforms (DWT) and Discrete Cosine Transforms (DCT). These techniques were utilised to extract the features of the student's face, which were then classified using the Radial Basis Function (RBF). The accuracy rate of this system was 82 percent.

III. PROPOSED ALGORITHM

All students in the class must register by providing the necessary information, after which their photos will be taken and stored in the dataset. Faces will be detected from live streaming video of the classroom during each session. Faces will be identified and compared to photographs in the dataset. If a match is found, the student's attendance will be recorded. A list of absentees will be mailed to the individual faculty overseeing the session at the end of each session.

The suggested system's system architecture is shown below. This procedure is usually separated into three stages:

1. Dataset Creation
2. Face Recognition
3. Recognition of faces Updating Attendance

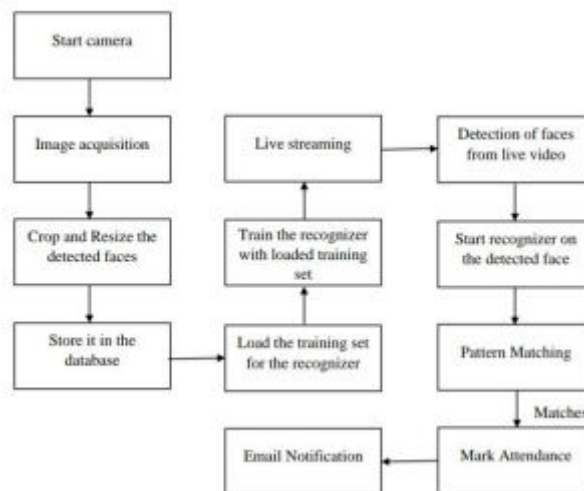


Fig.1 System Architecture

IV. CONCLSUION

Using face recognition algorithms, this system tries to provide an effective class attendance system. The suggested technology will be able to track attendance using facial recognition. It will use the webcam to detect and recognise faces. It will mark the acknowledged student's attendance and update the attendance record after recognition.

V. FUTURE WORK

In the future, we can make some of the following changes to the system to increase its functionality and reliability:

1. Create a self-generating defaulter list for any student whose attendance falls below 75% after a certain amount of time.

2. The system must differentiate between recognised and unknown faces; unknown faces can be stored in a separate database.

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