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## Survey on Attendance Management System Using Face Recognition

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**ABSTRACT:** Face recognition systems have been used in a wide variety of applications. Using face recognition based attendance marking system, the camera/CCTV placed in the classroom will capture the image and detects faces in the image. The detected images are then enhanced and recognized using face recognition technique. The recognized images are compared with the images in the pre-existing database. In this paper, an overview of some of the existing methods and the problems faced are mentioned.

**KEYWORDS:** Face Recognition, Database.

### I. INTRODUCTION

Security and verification of a person is a crucial part of any industry. One of the commonly used technique for this purpose is face recognition. Face recognition is an effective means of authenticating a person. There are several approaches to face recognition of which Principal Component Analysis (PCA) has been used extensively.

An automated attendance marking system can be implemented using this technique. If an automatic attendance system is developed for attendance, it eliminates the need for stationary materials and personnel for keeping of records. The results showed improved performance over manual attendance management system.

### II. LITERATURE SURVEY

#### A. Attendance Management System Using Face Recognition

In this system, the CCTV is fixed at the entry of the class room and is used to capture an image of the entering student. The detected faces are stored in a database and is compared with the existing images using Eigen faces methodology. [1]

To identify if the student image is matching, a 3D face recognition technique is used. If a match is found, that image is processed for attendance management. For attendance management, the attendance will be marked for the student image matched and the information is sent to the server which controls the overall database of the student. The software is installed in a smart phone that would help to improve the report features. When the server receives the message of student who are absent that particular day will send an SMS to the parent of that particular student.

#### B. Facerecognition based attendance marking system

The system consists of a camera that must be positioned in the office room to take snap shots of the room. These images are then sent to an enhancement module where Histogram Normalization is used for the contrast enhancement of the image, Median Filter is used for removing noise from the image. To avoid false detection skin classification technique is used. This process first classifies the skin and then retains only the skin pixels and other the other pixels are set to black. The enhanced image is then sent to a face detection and recognition module. This requires MATLAB software version 7.6. Two databases are maintained, the first one is the Face database to store the face images and extracted features at the time of enrolment process and the second attendance database contains the information about the employees and is also used to mark attendance. [2]

#### C. Study of Implementing Automated Attendance System Using Face Recognition Technique



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The proposed system has been implemented in three basic steps. The first step is face detection and extraction. The user stands in front of the camera and an image is captured, which is taken as input. The frontal face is captured by using the OpenCV Haar Cascade method. After the face is detected, it is converted into a gray scale image of 50x50 pixels. The second step is to learn and train face images. The system needs to be initialized by feeding it a set of training images of faces. The PCA algorithm is performed on it. A subspace is found by using PCA and all the training images are converted to points in this subspace. All the learned data is stored in an xml file. The third step is the recognition and identification. In this step the frontal face that is to be recognized, test face, is extracted from the image. The Eigen value for the test face is re-calculated and is matched with the stored data for the closest neighbor. Finding the closest neighbor is implemented as a function that computes distance from the projected test face to each projected training set. The distance basis here is "Squared Euclidean Distance." When a face is matched the corresponding information is obtained from the database. The log table is then updated with the system time to mark the attendance of that person. [3]

#### D. Face Recognition-based Lecture Attendance System

The system consists of two cameras; one for determining the seating positions (fixed at the ceiling) and the other for capturing the students face (Fixed in front of the seats). To determine the target seat Active Student Detection (ASD) method is used to estimate the existence of a student on a seat. One seat is targeted and camera is directed to capture the image. The face image capture is enhanced and recognized and are recorded into the database.

Every seat has a vector of values that represent relationship between the student and seat. Attendance is estimated by interpreting the face recognition data obtained by continuous observation. The position and attendance of the student are recorded into the database. [4]

#### E. Implementation of classroom attendance system based on face recognition in class

The system consists of a camera that captures the images of the classroom and sends it to the image enhancement module. To enhance the captured image histogram normalization, median filtering and skin classification methods are used. Face detection is done using Viola-Jones algorithm. Initially face detection algorithm was tested on variety of images with different face positions and lighting conditions and then algorithm was applied to detect faces in real time video. Algorithm is trained for the images of faces and then applied on the class room image for detection of multiple faces in the image. The next step is face recognition, where a hybrid algorithm from PCA and LDA is used. The detected faces are cropped from the image and compared with the face database using an Eigen face method. The face database consists of templates of face images of individual students that was collected and stored by an enrollment process. In this way the faces of students are verified one by one and the attendance is marked on the server. A time table module is attached to the system to obtain the subject, class, date and time. Teachers come in the class and just press a button to start the attendance process. [5]

### III. CONCLUSION

An automatic attendance management system aims at solving the issues of manual methods of existing systems. They use the concept of face recognition to implement a system that marks the attendance of a particular person by detecting and recognizing the face. These systems perform satisfactorily with different facial expressions, lighting and pose of the person.

There is room for improvement since these systems sometimes fail to recognize every face student present in the class room. The speed at which the face recognition is done is a problem. The privacy of the students whose images are stored in the databases must be considered so that it is accessible only to authorized people.

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