Student Attendance System Using Face Recognition

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Abstract: **Face detection and face recognition are leading technologies nowadays. Using this technology, we got variety of uses such as it improves the security, Variation of distance between the cameras, Recognize the person's image in photograph and video graphics. We decided to make a gadget that discover and recognize the face as a student attendance system. The objective of these project is to make a system to help the lecturers to take attendance of students in executive way.**

Keywords: Biometrics, Face detection, Face recognition, Student Attendance System, database.

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I. INTRODUCTION

These days, technology seeks to convey a large amount of knowledge-based technical advancements. Deep Learning is an intriguing subject that allows a machine to educate itself using datasets as input and then deliver an acceptable output during testing using various learning techniques. Nowadays, attendance is seen as a critical aspect for both students and teachers in educational institutions. With the progress of deep learning technology, the computer can now automatically recognise the students' attendance performance and keep a record of it. In general, a student's attendance system can be kept in two different ways, namely,
  • Manual Attendance System (MAS)
  • Automated Attendance System (AAS). Manual Student Attendance Management is a method in which a teacher in charge of a particular topic must manually call the students' names and record their attendance. Manual attendance may be viewed as a time-consuming process, and it is possible that the instructor will miss someone, or that pupils will respond to the absence of their friends many times. As a result, a difficulty occurs. when we think about the traditional process of taking attendance in the classroom.

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II. RELATED WORK

2.1 Fingerprint Based recognition system: A portable fingerprint device must be configured with the students fingerprint prior to using the existing fingerprint-based attendance system. The student must record the fingerprint on the set device later, either during lecture hours or prior, to ensure their attendance for the day.

2.2 RFID Based recognition system: The student must bring a Radio Frequency Identity Card with them and place it on the card reader to register their presence for the day in the RFID-based existing system. The system can connect to RS232 and save the attendance information to a database. There is a chance that fraudulent access will occur.
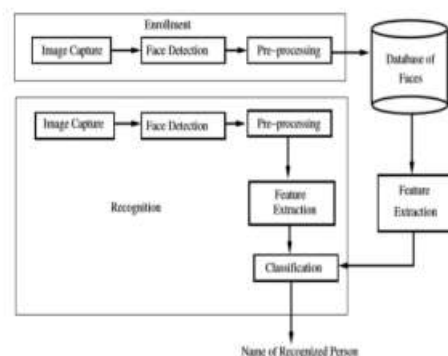
General face recognition model

2.3 Iris Based Recognition System: The student must stand in front of a camera in order for the camera to scan the student's Iris in the Irisbased student attendance system. The iris scan is compared to the student's data in the database, and the attendance on their presence must be updated. This decreases the institute's faculty member's paper and pen workload. This also helps to keep student records safe by reducing the likelihood of proxies in the classroom. It is a wireless biometric approach that addresses the issue of bogus attendance as well as the difficulty of setting up the necessary network.

2.4 Face Based Recognition System: Facial recognition technology can be used to track attendance by using a high-resolution digital camera to identify and recognise students' faces, and then comparing the detected face to students' face photos recorded in a database. The attendance is registered in the attendance database for further calculation once the student's face is matched with the stored image. If the taken image does not match the face of a student already in the database, it is saved as a new image in the database. There is a chance that the camera will not capture the image properly in this method, or that it may miss some of the kids.
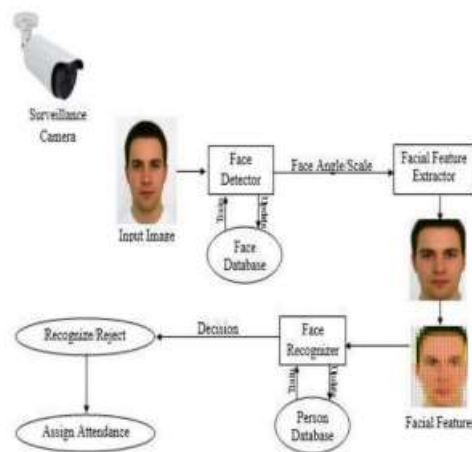
The csv file's content is organised in a certain way. The images will be incorporated into a training process after a sufficient number of shots have been collected in the database. The three major types of training processes in OpenCV 3.4 are Eigen Faces, Fisher Faces, and Local Binary Patterns Histograms (LBPH). In this project, the Eigen Faces recognizer will be the focal point. The premise behind Eigen Faces is simple: it recognises a certain face by capturing the face's biggest deviation and then translating those differences into information that can be compared when a new face appears. During the training phase, the csv file will be read to provide the path to all of the photographs, which will then be loaded into a list variable.

2.5 The face database is organised hierarchically as follows: Following the successful retrieval of facial photographs into the appropriate folder, a CSV file is created to aid in the next stage of training the recognizer with the faces. A script called create csv.py will be used to create the CSV file. The content of the CSV file in this project will be in the following format.
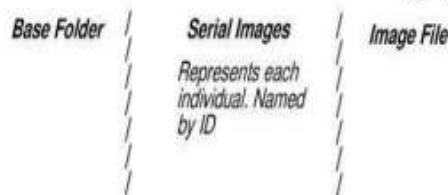
III. PROPOSED METHODOLOGY

The suggested system's goal is to record each student's face and put it in a database for their attendance. The student's face must be caught in such a way that all of the features of the student's face are detected, as well as the student's seating and posture. The teacher does not need to physically take attendance in class because the system takes a video, and the face is identified and the attendance database is updated through further processing stages.
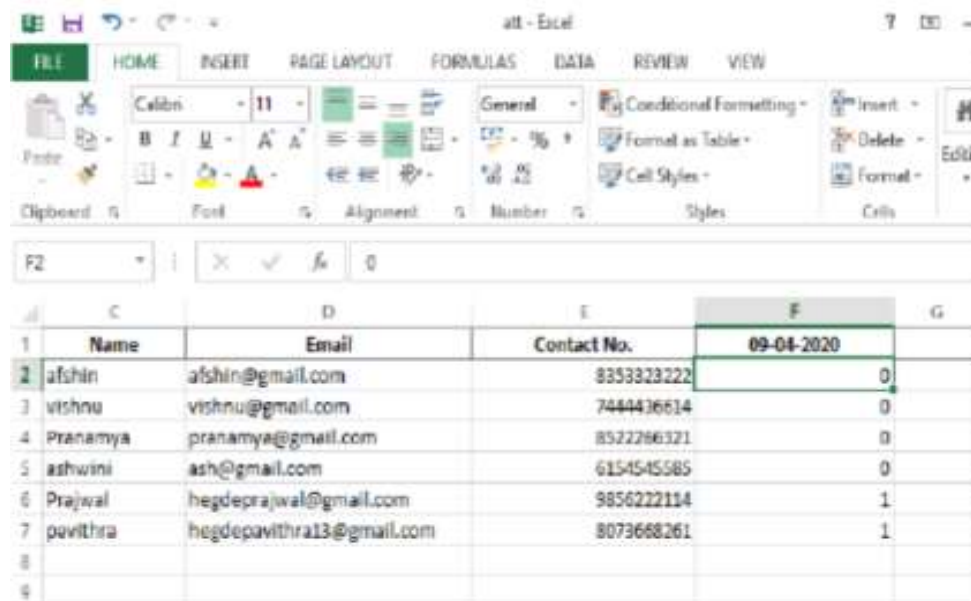
3.1 Capture video:
Inside a classroom, the camera is fixed at a certain distance to capture videos of the complete class's frontal views.

3.2 Separate as frames from the video:
To build the attendance database, the acquired video must be transformed into frames per second for easier detection and recognition of the students' faces.

3.3 Face Detection: Face detection is a procedure in which an image (picture) is searched for any faces. Once a face is found, image processing cleans up the facial image to make it easier to recognise. Face detection can be done using the CNN algorithm.

3.4 Attendance Updation : The recognised faces will be marked as present on the excel sheet, while the remainder will be marked as absent, and the list of absentees will be mailed to the respective faculties. At the conclusion of each month, faculties will be updated with a monthly attendance sheet. Faculty must submit their course code at the beginning of each session. The camera will start automatically after you provide the course code. The figure depicts a facial recognition window in which two registered students are recognised; if they were not registered, the window would have displayed 'unknown.' The window will dismiss when you hit CTRL+Q, and the attendance will be updated in the excel sheet and the names of absentees will be emailed to the appropriate faculty. The attendance sheet has been updated after the recognition procedure, as seen in Fig Students who have been identified are indicated with a '1', while those who have not been identified are marked with a '0.' The list of absentees will be emailed to the faculty member's email address

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