Mini Project Mid Term Report

on

Attendance Marking System

Under the guidance of

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Declaration

We hereby declare that the work which is being presented in the B.Tech. Project **"Attendance Marking Systemn"**, in partial fulfillment of the requirements for the award of the **Bachelor of Technology** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of our own work carried under the supervision of **Mr. Piyush Vashishtha.** The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

Acknowledgement

We take this opportunity to express our profound gratitude and deep regards to our guide Mr. Piyush Vashishtha for this exemplary guidance, monitoring and constant encouragement thought-out the course of this project. The blessing, help and guidance given by him time to time shall carry us a long way in the journey of life. We wish to acknowledge the encouragement received from friends for initiating my interest in this topic and also for their unparalleled help and motivation round the clock to carry out my project work. Lastly, we would like to thank all professors for their help, moral support and wishes. And we would also like to thank Kaggle and Jupyter team for providing better platform.

Abstract

Student attendance management system deal with the maintenance of the student's attendance details. It is generates the attendance of the student on basis of presence in class. It is maintaining daily basis of attendance, the staff will be provide with the separate username and password to make student attendance. The staff handling the particular subject to responsible to make the attendance for all students. Only if the student presents the particular date, the attendance will be calculated. The student attendance report based on monthly and consolidate will be generated.

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Introduction

1.1Overview and motivation:

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 geometric feature like eyes, nose, eye brows, and cheeks to recognize the face.

Our system uses face recognition approach to reduce the flaws of existing system with the help of machine learning, it requires a good quality camera to capture the images of students, the detection process is done by histogram of oriented gradient. And recognizing perform through deep learning. The frontend side (client side) which consist of GUI which is based on electron JS and backend side consist of logic and python (server side), an IPC (Inter Personal Communication) bridge is developed to communicate these two stacks.

1.2 <u>Objective</u>:

In this project, a number of Face recognition based attendance management system have introduced in order to improve the performance of students in different organization. In Jomon Joseph, K. P. Zacharia proposed a system using image processing, PCA, Eigen faces, Microcontroller, based on Matlab . Their system works only with front face images and there is need of a suitable method which works with the orientation of the system. Ajinkya Patil with their fellows in proposed a face recognition approach for attendance marking using Viola jones algorithm, Haar cascades are used to detect faces in images and recognition performs through Eigen face method. Another approach of making attendance system easy and secure, in the author proposed a system with the help of artificial neural networks, they used PCA to extract face images and testing and training were achieved by neural networks, their system performs in various orientation. A 3D face recognition approach for attendance management system was proposed by MuthuKalyani.K , VeeraMuthu. A has proposed, they marked attendance with monthly progress of each student. There is need for an alternative algorithm which can enhance the recognition on oriented faces. Efficient Attendance Management system is designed with the help of PCA algorithm , the have achieved accuracy up to 83% but their system performance decreases due to slightly changes in light condition. An eigen face approach along with PCA algorithm for marking face recognition attendance system have introduced by author in , they mention comparison of different face recognition algorithm in their paper. Overall it was good approach to maintain record of attendance.

Proposed Work

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In this project we have detect an image of a person. For this we have used the image dataset. This will be done in many phases.

Attendance marking and management **system** is **proposed** by using face detection and recognition algorithms. Identification of human faces by the unique characteristics or features of their face is known as Face recognition.

About OPENCV:

OpenCV is a Python open-source library, which is used for computer vision in Artificial intelligence, Machine Learning, face recognition. In OpenCV, the CV is an abbreviation form of a computer vision, which is defined as a field of study that helps computers to understand the content of the digital images such as photographs and videos.

The purpose of computer vision is to understand the content of the images. It extracts the description from the pictures, which may be an object, a text description, and three-dimension model, and so on. For example, cars can be facilitated with computer vision, which will be able to identify and different objects around the road, such as traffic lights, pedestrians, traffic signs, and so on, and acts accordingly.

About Face Recognition :

A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces , typically employed to authenticate user through id verification services, works by pinpointing and measuring facial features from a given image. **Face recognition** systems can be **used** to identify people in photos, video, or in real-time. Law enforcement may also **use** mobile devices to identify people during police stops.

Implementation

The entire dataset contains 5-10 images, with one folders, named face detection.

Now come to the project, we have imported many libraries in our program such as OpenCV , numpy , face-recognition , os , data time module.

Image Processing:

The facial recognition process can be split into two major stages: processing which occurs before detection involving face detection and alignment and later recognition is done using feature extraction and matching steps.

1. **FACE DETECTION :**

   The primary function of this step is to conclude whether the human faces emerge in a given image, and what is the location of these faces. The expected outputs of this step are patches which contain each face in the input image. In order to get a more robust and easily designable face recognition system.

   Face alignment is performed to rationalize the scales and orientation of these patches**.**

2. **FEATURE EXTRACTION** :

   Following the face detection step the extraction of human face patches from images is done. After this step, the conversion of face patch is done into vector with fixed coordinates or a set of landmark points.

3. __FACE RECOGNITION :__

      The last step after the representation of faces is to identify them. For automatic recognition we need to build a face database. Various images are taken foe each person and their features are extracted and stored in the database. Then when an input image is fed the face detection and feature extraction is performed .

Requirements

1. ## <u>Dependencies:</u>

    - Python 3.8
    - Python libraries like
        i.   Cv2
        ii. Face_recognition
        iii. OpenCV
        iv. Tensorflow

2. ## <u>Hardware Requirements</u> (minimum)

    - 4 GB RAM
    - 20 GB HDD
    - 1024 x 768 Display
    - Keyboard
    - Mouse

3. ## <u>Software Requirements:</u>

    a. ### <u>System Software:</u>

        - Operating System like Windows 10 or Linux

    b. ### <u>Application software:</u>

        - Jupyter Notebook

4. ## <u>Technologies used:</u>

    - Python
    - Open CV

References:

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- https://pypi.org/

- https://machinelearningmastery.com/blog/

- https://www.youtube.com/

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- https://www.pyimagesearch.com/start-here/

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