



Real Time Image Based Attendance System

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Abstract— In recent years, attendance tracking systems have become an integral part of educational institutions and organizations. In this paper, we present a real-time image-based attendance system that is capable of automatically recognizing and registering the attendance of a person in a classroom or organization. The proposed system utilizes facial recognition technology to identify a person's face and compare it with a database of registered images for attendance tracking. The system is designed to be fast, accurate, and reliable. Additionally, the system provides a secure, efficient, and cost-effective solution for attendance tracking in educational institutions and organizations.

Keywords— Attendance. system, Automatic attendance, Image processing, Face detection, Feature matching, Face recognition.

I. INTRODUCTION

Attendance tracking systems have become an important part of educational institutions and organizations in recent years. Traditional attendance tracking systems rely on manual methods such as signing in and out or using a barcode reader. These methods, albeit effective, can be time-consuming and prone to errors. Moreover, they are not secure, as they can be easily manipulated or tampered with.

In this paper, we present a real-time image-based attendance system that is capable of automatically recognizing and registering the attendance of a person in a classroom or organization. The proposed system utilizes facial recognition technology to identify a person's face and compare it with a database of registered images for attendance tracking. The system is designed to be fast, accurate, and reliable. Additionally, the system provides a secure, efficient, and cost-effective solution for attendance tracking in educational institutions and organizations.

This system will also help in evaluating the student's attendance

through eligibility criteria. With just a click of the mouse, the system that will be able to create a student attendance report, reducing the need for manual work that is prone to human error and time-consuming.

II. OBJECTIVE

The ultimate end of the conventional attendance management schools, colleges and institutes. It facilitates access to information about the attendance of a particular student in a particular class. Ascertaining the student's suitability for attendance will also be aided by this method. The system will be able to generate a student attendance record with just one mouse click, eliminating the need for Manual work that is time consuming and prone to human error.

1. The purpose of this project is to develop an automatic attendance system based on facial recognition.
2. Performance expected to meet objectives:
 - a) Face segment detection.
 - b) Extract useful features from the detected faces.
 - c) Classify the features to recognize the recognized face.
 - d) Record the existence of the identified student.

III. Facial Recognition Algorithm

In this proposed system the system utilizes a facial recognition algorithm to identify and register the attendance of a person. The algorithm consists of the following steps:

- begin
- item Capture the image of the person using the camera.
- item Pre-process the image data to remove noise and enhance the image.
- item Extract the facial features from the image using the facial landmark detector.
- item Compare the extracted features with the registered images in the database.
- item If a match is found, register the attendance of the person.

➤ end{enumerate}

The facial recognition algorithm is designed to be fast, accurate, and reliable. It is capable of recognizing a person's face in real-time and registering their attendance with a high degree of accuracy.

III. LITERATURE SURVEY

1. *Face Recognition-Based Attendance System Using Machine Learning Algorithms* "Radhika C. Damale; Bazeshree V. Pathak".

Remark- This paper mainly concentrates on CNN based on this approach, images were fed directly to the CNN module as feature vectors.

2. *A presence marking system based on facial recognition..*" Khem Puthea; Rudy Hartanto; Risanuri Hidayat;".

Remark- Detailed analysis of recent events and principal component analysis, discussion and suggestions for future work.

3. *Attendance system based on face recognition using eigenfaces and PCA algorithm.* Jagruti Chaudhary; Shweta Patil;".

Remark- This paper evaluates the application by updating the students about college events like workshops, conferences, paper presentations, etc. also providing updates about notices regarding seminars, etc.

4. *Event Management System.*" Joseph, Jomon; Nirmalya ;Neerja;".

Remark- This paper aims to use eigenvectors and eigenvalues for face detection. Use PCA to train and reduce dimensionality and ANN to classify the input data and find patterns.

5. *College Event Management System.*" Kar, Nirmalya, Syen navaz, Visar Shehu;".

Remark- This paper focuses on combining PCA with Fuzzy feature extraction on a dataset tested on Indian individuals to obtain better attendance scores using PCA and ANN.

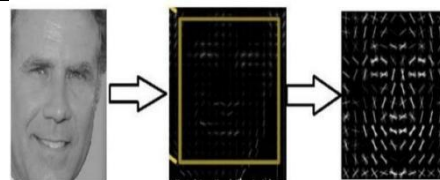
IV. METHODOLOGY

The system currently testing with the student camera as the acquisition medium for images, in the classroom. The camera may take images and store it on the drive or it can perform live detection and recognition. The system starts the camera on the user request (in this case course teacher), who logs into the system with password on the user interface of the system.

A)

1. Face Detection:

The model in training and recognition process are similar in principle, but there are additional steps in the system recognition process. First, when the system is used on an image, it applies a Histogram-Oriented-Gradient (HOG). HOG uses gradient arrows based on the increasing darkness of the image by dividing the image into small squares of 16x16 pixels. From these squares, we transform the image using the direction of the strongest arrows and later compare it with his HOG face pattern image for facial recognition.



(Fig. Face detection using HOG features.)

2. Face Identification:

After recognizing facial features, the system is trained to take 128 measurements of faces. Training is a process in which the same person provides approximately the same measurements for each image. This is called padding.

3. Multiprocessing:

Multiprocessing is to applied to increase the total number of frames to processed in a given amount of time and reduce the total time taken for a sequence of frame. This allows the computer to fully utilize all logical cores for a short period of time to deliver output faster.

4. Attendance Recording:

After processing and facial identification, attendance of recorded against roll numbers. Since multiple frames are used to capture attendance multiple times, the average is calculated using the frame number and the resulting number of captured images.

B)

Technology used

1. Python:

Python is an interpreted, high-level, general-purpose programming language. Its design philosophy uses clear indentation to emphasize code readability. Its language structure and object-oriented approach are aimed at helping programmers write clear and logical code in small and large projects.

2. Face Detection:

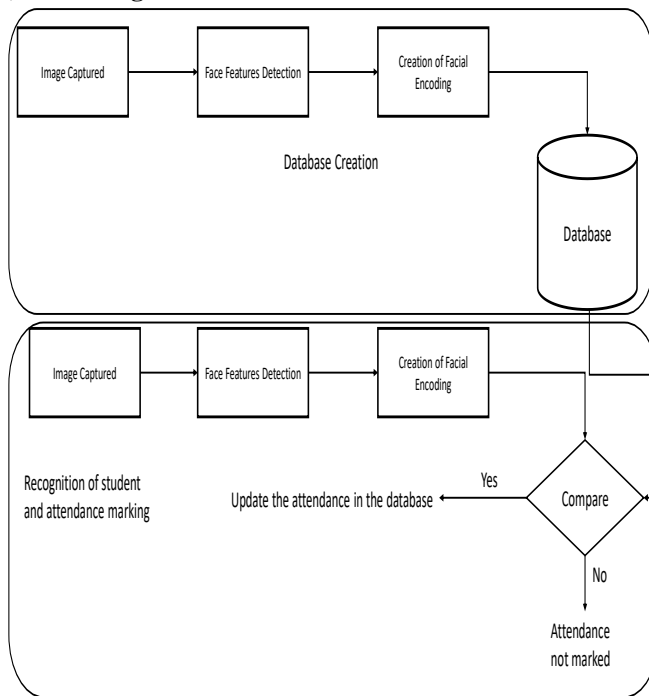
face detection is a computer technology used to identify human faces in digital images by determining the location of the faces in the image and extract sub images for each face. Viola Jones algorithm will be implemented to recognize face and non-face patterns and enable us to identify locations of the faces in the image.

3. OpenCV:

OpenCV (Open-supply-computer-vision-Library) is an open supply laptop vision and gadget learning software library. OpenCV changed into constructed to provide a common infrastructure for computer imaginative and prescient applications and to boost up using device belief inside the commercial merchandise. Being a BSD-certified product, OpenCV makes it smooth for businesses to make use of and adjust the code.

C)Block Diagram:

VI. REFERENCES



V. CONCLUSION

In this paper, we presented a real-time image-based attendance system which is capable of automatically recognizing and registering the attendance of a person in a classroom or organization. The proposed system utilizes facial recognition technology to identify a person's face and compare it with a database of registered images for attendance tracking. The system is designed to be fast, accurate, and reliable. Additionally, the system provides a secure, efficient, and cost-effective solution for attendance tracking in educational institutions and organizations.

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