

A Review on Biometric Verification using Open CV

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Abstract

In this digital era, the face recognition system plays a vital role in almost every sector. Face recognition is one of the mostly used biometrics. It can be used for security, authentication, identification, and has many more advantages. Furthermore, face recognition systems can also be used for attendance marking in schools, colleges, offices, etc. This system aims to build an attendance system which uses the concept of face recognition as the existing manual attendance system is time consuming and hard to maintain. And there may be chances of proxy attendance. Thus, the need for this system increases. This system consists of four phases-database creation, face detection, face recognition, attendance updating. Database and the CSV file will be created and attendance will be updated to it. Attendance will be mailed to the respective Person's Mail Id at the end.

Index Terms: Face detection, Face recognition, Open CV, Attendance.

I. Introduction

The act of recording attendance in a classroom during a lecture is not just laborious but also time-consuming. There will always be a chance that a proxy attends the lecture because there were abnormally many pupils in attendance. Conventional techniques of attendance marking have been difficult to implement. A rising problem in the field of face recognition is the increasing demand for effective and automatic methods of recording attendance.

The issue of automatic attendance marking has recently received a lot of attention thanks to the application of computer vision. However, the aspect of dependability is absent from these methods. In this project proposal, a face detection and recognition-based automated attendance marking and management system is proposed. This system's goal is to create an automated system that uses facial recognition technology to track student attendance rather than the more traditional techniques. The major goal of this effort is to make the system for tracking attendance effective, time-saving, straight forward, and uncomplicated. In this instance, facial recognition techniques will be used. The processed image will then be compared to the already-stored record, and attendance will then be recorded in the database as appropriate. This technique lessens the workload of individuals when compared to the current system's traditional attendance marking system. The suggested system will be implemented in four phases, including image capture, group image segmentation and face detection, face comparison and recognition, and updating attendance data in the database.

II. Literature Survey

The authors proposed an RFID card- based attendance system. The recommended RFID tag is used in this tactic with the power of the tag reader. This approach presents a problem because a stranger could enter the university using a valid ID card. Studies have also looked at using biometrics to track attendance. The use of fingerprints to track student attendance is described. A biometric sensor records the fingerprint, and feature extraction is done on

the data. The data is placed into the database if it is for enrollment; otherwise, if it is for authentication, it is compared to the data already present. The problem with this method is that pupils must go to the location of devices during class hour in order to Mark Attendance. Additionally, use iris-based attendance systems. The method's vulnerability to outside factors is a disadvantage. It was suggested to use Eigen face recognition to create a facial recognition-based attendance system. By converting images into eigen faces and comparing the resulting eigenface to eigen faces in the database, recognition is accomplished. This approach has a problem in that it cannot recognize a person's face if they are wearing glasses, have a thick beard, etc., and is very sensitive to facial background and head orientations. Our system can still recognise a person's face even if they are wearing a beard, glasses, or other facial features when employing the technique described in this study since it is not sensitive to face background or head orientations.

Iii. Proposed Methodology

All the students of the class must register themselves by entering the required details and then their images will be captured and stored in the dataset. This application mainly follows three steps. Firstly, it will take images and compare them with the existing images which are classified in the camera. Secondly, it will mark present all the matched images automatically on a database and there meaning students will be absent from that class. Thirdly, the matched images and the time of attendance is stored in the Excel spreadsheet .The images mentioned here contain the photo of the students.

Iv. Methodology

1. Pre-processing

The pre-processing sub-module is responsible for pre-processing the input image to enhance the face detection and recognition accuracy. This sub-module includes various techniques such as resizing, normalization, and Gray-scaling.

2. Face detection

The face detection sub-module is responsible for detecting faces in the pre- processed image. It uses a pre-trained face detection model to detect faces in the image. The sub-module can also detect multiple faces in an image.

3. Face recognition

The face recognition sub-module is responsible for recognizing the detected faces based on the extracted features. It uses a machine learning algorithm such as classification algorithm to classify the faces.

4. Attendance

The marking attendance module can be designed to automate the process of taking attendance in a project or organization, which can save time and improve accuracy. The module can also generate reports and statistics on attendance trends and patterns, which can be used for monitoring and decision-making purposes.

5. Mail

The module provides a simple and easy-to- use interface for working with email messages, including setting up the email server, creating email messages, and sending and receiving emails.

V. BIOMETRIC PROCESSING

1. Pre-processing

While the system starts, it stores the face encoding of pre-stored images in to list for further processing and the web camera starts capturing the images.

2. Face detection

The face is detected using the webcam of the system.

3. Face recognition

Find the face encoding of the captured images from the web camera and it will be compared with the face encodings done in Pre-processing. If the encoding is matched, the face is recognised.

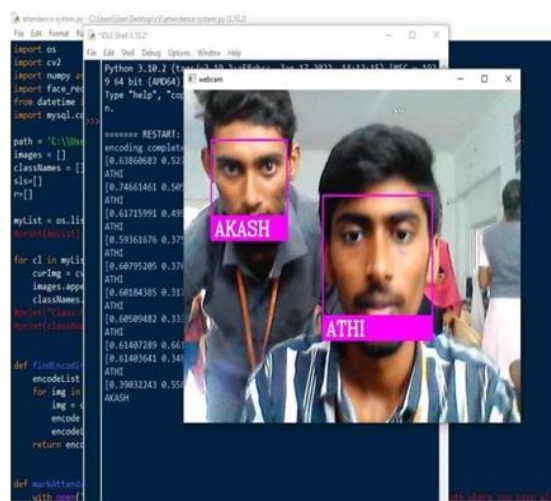
4. Attendance

If the face is recognised the attendance for the particular person is marked in csv file as well as the database.

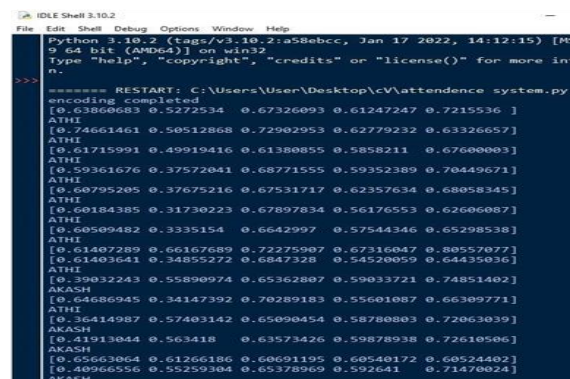
5. Mail

By default the system has a timer of 5 Minutes from the Starting of the system. After the time exceeds the system automatically closes and the current status of the attendance of CSV File will be mailed to the registered mail id.

Vi.Experimental Results



FACE RECOGNITION



FACE ENCODINGS OF CAPTURED IMAGES

Name	Time
ATHI	17:14:23
SARATHI	17:14:24
AKASH	17:14:30
NANDHU	17:14:37

```

mysql> show databases;
+-----+
| Database |
+-----+
| demo     |
| information_schema |
| mysql    |
| performance_schema |
| sample   |
| sumo     |
| sys      |
+-----+
7 rows in set (0.61 sec)

mysql> use demo;
Database changed
mysql> show tables;
+-----+
| Tables_in_demo |
+-----+
| students       |
+-----+
1 row in set (0.11 sec)

mysql> select * from students;
+-----+-----+
| name  | status |
+-----+-----+
| ATHI  | Present |
| AKASH | Present |
| NANDHU | Absent |
| SARATHI | Absent |
| SUMO  | Absent |
+-----+-----+

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CSV FILE

DATABASE

VII. Conclusion

Face recognition using Open CV is a powerful and versatile technology that can be used for a wide range of applications, such as security, surveillance, access control, or marketing. The implementation of face recognition using Open CV involves several key components such as face detection, feature extraction, classification, and recognition. The system can be designed to work with various input sources, use pre-trained deep learning models, implement pre-processing techniques, use machine learning algorithms, and provide real-time feedback to the user. The system can also incorporate a user interface, store the recognized faces in a database, and ensure the

privacy and security of the users' personal data. Overall, face recognition using Open CV is a valuable technology that can provide significant benefits to a project or organization.

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