Automated Attendance System using Real Time Face Recognition and MySQL Database

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Abstract

This project aims to design a automated attendance system using face-recognition and MySQL database. We have presented our idea to implement an "Automated Attendance System Using Real Time Face recognition and MySQL Database". The application includes face identification, which saves time as well as being purely software based it can be flagged as eco-friendly as it reduces the use of paper and also send a message to the student of his attendance record in the end of every day. This system also eliminates the chances of fake attendance because of the face being used as a biometric for authentication. This system avoids the concept of fake attendance where attendance plays an important role. The proposed system is designed in Python as well as SQL database. The algorithm used in the system compare the image captured encoded value with the value already available with us to recognize the face. The system has output in the form of MYSQL Database.

Keywords: Eco-friendly, Automated time tracking system, No manual work done.

1. Introduction

This project aims to design an automated attendance system using face-recognition and MySQL database. In this experiment, four investigation experiments were carried out: the accuracy rate of the face recognition system in actual check-in; the stability of the face recognition time and attendance system with real-time video processing; analysis of the skip rate of face recognition attendance system using real-time video processing; interface settings of face recognition attendance system using real-time video processing. The experimental results show that the automated attendance system achieves time and attendance results through face recognition technology and a database, which fully reflects the design of the overall algorithm

2. Literature Survey

In manual attendance system :

* Human errors are high
* Students can commit time theft
* Manual time entry is very time consuming.
* Keyboard and printing errors
* Incorrect Entry of Times
* Too much paperwork

Doi : https://doi.org/10.54216/JCHCI.020102

Received: July 21, 2022 Accepted: November 23, 2022

3. Implementation

This Article will mainly look into the libraries such as face recognition and Dlib to recognize the face in real time MySQL -connector package to automatically enter the attendance in the created database and Twilio to send message to the respective phone number if absent in order to solve our problem of an attendance system. In this project we start with importing the required libraries CMake, Dlib, NumPy, Twilio, date time and packagescv2 face-recognition MySQL -connector OS to fulfill our requirements use the OS. list dir function to return a list containing the names of the students data in the directory given by path. Using a user defined function we find the encodings through face-recognition function and store it in a list, now we have face embeddings for every student in a list, the next step is to recognize a new image and compute the face embedding for the image using the same method we used earlier and then compare its embedding with the list of embeddings that we have. We recognize the face if the generated embedding is closer or similar to any other embedding and if yes we update our attendance to "present" for the respective student in our database created using MySQL through MySQL -connector package automatically and if the attendance is not present after the particular day we send a message to the respective students and parents mobile no and achieve our "Automated Attendance System Using Real Time Face Recognition and MySQL Database" projects result.

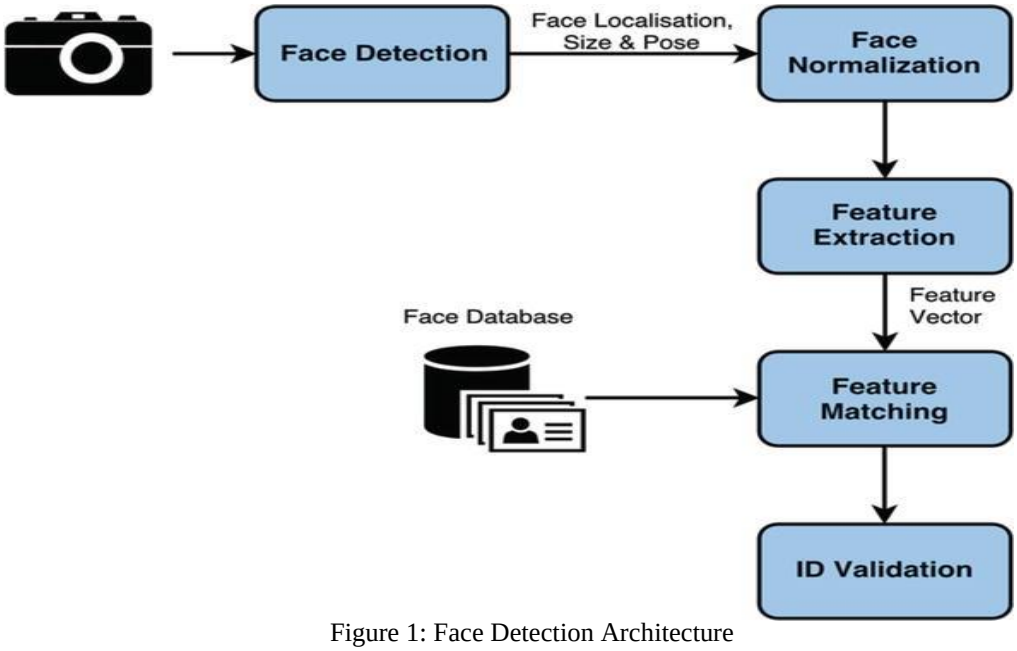

Figure 1: Face Detection Architecture

In this figure 1, we have explained how the face has been detected in real time using the students face we already have in our database.

a) Advantages

* Automated Time Tracking System.
* Cost-Effective.
* Facial Recognition with Ageing Changes and Accessories.
* More Accurate and Better Worker Attendance.
* Easy to Manage.

b) Requirements

* File containing students images.

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* Webcam to recognize the students.
* MYSQL database to store the attendance data.
* Software to automate the face recognition, mark attendance automatically and send message if absent.

c) Process

The webcam record the students faces in real time and our software compares the encodings of the image captured by the webcam and the encodings present in our list and marks attendance for the respective student as present automatically in the database created and at the end of the day if the attendance value of a student is absent then it sends a message to the respective student's parent mobile number automatically. For finding faces we use hog algorithm HOG (Histogram of Oriented Gradients) feature descriptor with a linear SVM machine learning algorithm to perform face detection . For posing and projecting faces we are going to use an algorithm called face landmark estimation , the basic idea is we will come up with 68 specific points (called landmarks) that exist on every face — the top of the chin, the outside edge of each eye, the inner edge of each eyebrow, etc. Then we will train a machine learning algorithm to be able to find these 68 specific points on any face , then to obtain the encodings we train the neural network to generate 128 measurements for each person and use linear SVM classifier , All we need to do is train a classifier that can take in the measurements from a new image and tells which known person is the closest match. Running this classifier takes milliseconds. The result of the classifier is the name of the person.

4. Conclusion

The entire system is automated and does not require any manual work being done. It takes the attendance but also automatically record the entry time of the students which cannot be recorded perfectly using manual methods. It also adds to the security of the data and makes sure nothing goes wrong sine everything is automated and also the parents are informed about the students absence so there exists a good communication between the college and the parents, lastly it saves a lot of time wasted taking manual attendance and also eco-friendly since no papers are needed therefore no need of cutting the trees.

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Doi : https://doi.org/10.54216/JCHCI.020102

Received: July 21, 2022 Accepted: November 23, 2022

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Doi : https://doi.org/10.54216/JCHCI.020102

Received: July 21, 2022 Accepted: November 23, 2022