

SECURE ATTENDANCE IN FACE RECOGATION IN AI AND ML

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DOI: <https://www.doi.org/10.58257/IJPREMS32826>

ABSTRACT

Face identification has been considered an interesting research domain in the past few years as it plays a major biometric authentication role in several applications including attendance management and access control systems. Attendance management systems are very important to all organization though they are complex and time-consuming for managing regular attendance log. There are many automated human identification techniques such as biometrics, RFID, eye tracking, voice recognition. Face is one of the most broadly used biometrics for human identity authentication. This paper presents a facial recognition attendance system based on deep learning convolutional neural networks. We utilize transfer learning by using three pre-trained convolutional neural networks and trained them on our data. The three networks showed very high performance in terms of high prediction accuracy and reasonable training time

Keyword's: Face Recognition, Attendance system and Bio-metric, etc. Introduction (Heading 1)

1. INTRODUCTION

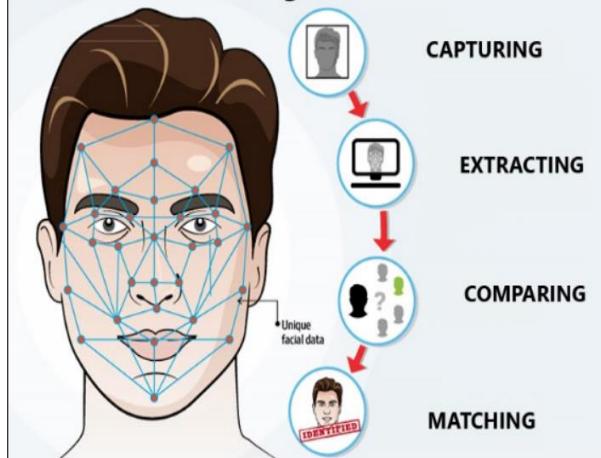
All organizations need an attendance management system to maintain a record of their staff attendance either manually or automatically. Students' daily attendance in class is essential for performance evaluation and quality. Face recognition is one of the few biometric methods that includes the merits of both accuracy and low intrusiveness. Due to this reason since the 70's, face recognition has gained attention of researchers in fields from security and image processing to computer vision. Face recognition is considered useful in multimedia information processing areas. Traditionally, attendances are taken manually in the class room using attendance registers given to the faculty members. But it is a time consuming event. Also, it is very difficult to verify students one by one in a large classroom environment, whether they are present or not. The proposed system demonstrates how face recognition is used for taking attendance of a student automatically using Java, how to store the faces in the database and how to retrieve the absent list. Ease of Use It determines if the image of the face of any given person matches any of the face images stored in a database. This problem is challenging to resolve automatically due to the changes that various factors, such as facial expression, aging and even lighting, can cause on the image. Amongst different biometric techniques facial recognition may be unreliable but it has several advantages over the others. This system is proven to be useful in various areas such as security and access control, forensic medicine, police controls and in attendance management system. The various techniques for marking attendance are:

- 1) Signature based System
- 2) Fingerprint based System
- 3) Iris Recognition
- 4) RFID based System
- 5) Face Recognition

Amongst the above techniques, Face Recognition is natural, easy to use and does not require aid from the test subject.. It is a series of several related problems which are solved step by step:

- 1) To capture a picture and discern all the faces in it.
- 2) Concentrate on one face at a time and understand that even if a face is turned in a strange direction or in bad lighting, it is still the same person.
- 3) Determine various unique features of the face that can help in distinguishing it from the face of any other person. These characteristics can be the size eyes, nose, length of face, skin colour, etc .

Biometrics Face Recognition - How does it Work?



4) Compare these distinctive features of that face to all the faces of people we already know to find out the person's name. Human brain is made to do all of this automatically and instantaneously. Computers are not capable of such kind of high-level generalization, so we need to teach or program each step of face recognition separately to the system. Face recognition system is further divided into two categories i.e. verification and identification. Face verification is a 1:1 match which compares a face image against a template face images, whose identity is being claimed. Contradictory, face identification is a 1:N problem that compares a query face image.

2. LITERATURE SURVEY

1. Aadhaar Based Biometric Attendance System Using Wireless Fingerprint Terminals.

Narra Dhanalakshmi; Sakti Goutham Kumar; Y Padma Sai.

Published in: 2017 IEEE 7th International Advance Computing Conference (IACC) In this paper, two different approaches are proposed to authenticate the captured fingerprint in the process of verification. The first approach uses data base which is created by the organization itself and the second approach uses the Aadhaar Central Identification Repository (CIDR). Wireless fingerprint terminals are used to capture and store the attendance records of the students in the device data base and updating them to the server data base.

SMS Alerts are sent to students and their parents in case of their irregularity, absence or shortage of attendance. Limitation: Aadhar Data may not be available and also fingerprint bases system has its own drawbacks.

The template is designed for, but not limited to, six authors. A minimum of one author is required for all conference articles. Author names should be listed starting from left to right and then moving down to the next line. This is the author sequence that will be used in future citations and by indexing services. Names should not be listed in columns nor group by affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization)

A web enabled secured system for attendance monitoring and real time location tracking using Biometric and Radio Frequency Identification (RFID) technology.

The main idea of this paper is to built a safe and secure web based attendance monitoring system using Biometrics and Radio Frequency Identification (RFID) Technology based on multi-tier architecture, for both computers and smartphones. Limitation: Students can exchange their RFID cards. 3. Real-Time Online Attendance System Based on Fingerprint and GPS in the Smartphone.

Lia Kamelia; Eki The purpose of the research is to develop an online presence system which is a combination of fingerprint modules and GPS. The ZFM-20 fingerprint module is used as the system's main input as well as a security tool as an entrance to get access to the entire system.

To determine the user's location and sends it to the smartphone, GPS Module is used. Arduino module present in the system will send a text message to the parties concerned about the user's location data automatically.

- Limitation: It is a fingerprint based system and has its own disadvantages.
- Design and Implementation of a Student Attendance System Using Iris Biometric Recognition.
- Kennedy O. Okokpuije; Etinosa Noma-Osaghae; Olatunji J. Okesola; Samuel N. John; Okonigene Robert..

3. PROBLEM STATEMENT

To develop a windows based prototype model for biometric attendance system using face recognition using python programming language

OBJECTIVES:

1. To detect faces.
2. To mark attendance
3. To check defaulter list.

Table 1: Comparison of different techniques used in face recognition-based attendance system.

Ref No.	Title & Authors Name	Concept Used	Advantages	Disadvantages
1.	Individual Stable Space: An Approach to Face Recognition Under Uncontrolled Conditions Xin Geng, Zhi-Hua Zhou, & Smith-Miles	Face recognition under uncontrolled condition. [1]	This paper projects on face recognition under uncontrolled conditions.	Video sequences, verification, and multiple persons per image required by most of the real applications can't be implemented.
2.	Anti-Cheating Presence System Based on 3WPCA Dual Vision Face Recognition Winarno, Wiwien Hadikurniawati, Imam Husni Al Amin, Muji Sukur	Dual vision face recognition using 3WPCA. [2]	It can anticipate falsification of face data with recognition accuracy up to 98%	The relative angle of the target's face influences the recognition score profoundly.
3.	Prototype model for an Intelligent Attendance System based on facial Identification Raj Malik, Praveen Kumar, Amit Verma, Seema Rawat	ADA Boost algorithm with techniques PCA and LDA Hybrid algorithm [7].	By using this system chances of fake attendance and proxy can be reduced.	Works only for single image of a system.
4.	Convolutional Neural Network Approach for Vision Based Student Recognition System	Alex NET CNNs and RFID Technology [8].	Uses the camera system to Monitor the scene information.	Alex NET won't work on all the students until it is improved. RFID technology uses electronic toy which can't be used in all the cases.
5.	NFC Based Mobile Attendance System with Facial Authorization on Raspberry Pi and Cloud Server Siti Ummi Masruroh	Iris Recognition [9].	Real time face detection and efficient	Iris condition needs to improve in different light conditions

4. PROPOSED SYSTEM

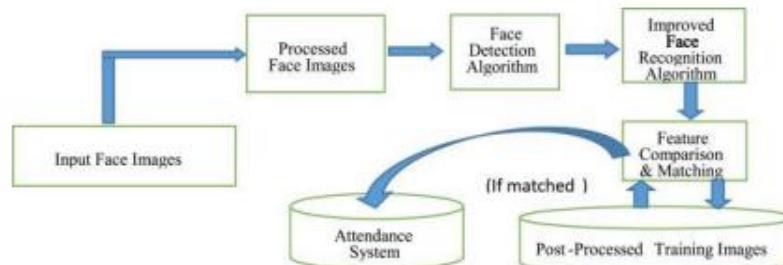


Fig.1: Proposed system architecture.

Proposed system is biometric attendance system using face recognition. Face detection has been extensively researched in past few decades. It is a specific case of object detection which determines the size of candidate faces in an image. It is a process of designing a system by giving input consisting of images that contains faces and then training a classifier to identify a face in an image. The main focus of this system is to decrease false positive rate thereby increasing accuracy.

5. METHODOLOGY

In order to mark attendance, we follow a series of steps which includes enrolment, face detection, face recognition, and then marking the attendance in a database. Unlike Eigenfaces and Fisherfaces, where in most modern face verification systems, training and enrolment are two different steps. Training is performed on millions of images. On the other hand, enrolment is performed using a small set of images. In case of Dlib, enrolling a person is simply passing a few images of the person through the network to obtain 128- dimensional feature descriptors corresponding to each image. In other words, we convert each image to a feature in a high-dimensional space. In this high dimensional space, features belonging to the same person will be close to each other and far away for different persons.

- A. Traditional Image Classification Pipeline Versus Dib's Face Recognition Model In a traditional image classification pipeline, we convert the image into a feature vector (or equivalently a point) in higher dimensional space.

6. ADVANTAGES

1. Ease in maintaining attendance.
2. Reduced paper work.
3. Automatically operated and accurate.
4. Reliable and user friendly.
5. Increased productivity.

APPLICATIONS

1. To verify identities in Government organizations.
2. Enterprises.
3. Attendance in Schools and colleges.
4. To detect fake entries at international borders.

7. CONCLUSION & FUTURE WORK

In this system we are going to implement an attendance system for a lecture, section or laboratory by which lecturer or teaching assistant can record students' attendance. It will save time and effort, especially if it is a lecture with huge number of students. Automated Attendance System has been envisioned for reducing the drawbacks in the traditional (manual) system. This attendance system demonstrates the use of image processing techniques in classroom. This system can not only merely help in the attendance system, but also improve the goodwill of an institution.

8. REFERENCES

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