



Face Detection and Recognition for Automatic Attendance System Using Artificial Intelligence Concept

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Abstract:

Student Attendance System is essential in all learning institutes for checking the performance of students. In most learning organizations, student attendances are physically taken by the utilization of attendance sheets issued by the institution heads as a component of regulation. The students sign in these sheets which are then filled or physically signed in to a PC for future verification analysis. This technique is repetitive, tedious and wrong as a few students regularly sign for their absent colleagues. This strategy additionally makes it hard to track the attendance of individual students in a huge classroom environment. In this project, we propose the plan and utilization of a face detection and recognition framework to consequently recognize students going to an address in a classroom and stamp their attendance by perceiving their faces. This facial biometric framework will consists of an enrollment procedure in which the remarkable features of a people's face will be put away in a database and after that the procedures of distinguishing proof and verification .In these, the recognized face in a picture (gotten from the camera) will be contrasted and the already stored faces caught at the time of enrollment.

Keywords: Student attendance, biometric, automated attendance system, face detection, face recognition

I. INTRODUCTION

Now a day's Image processing which manages extracting helpful data from a computerized image plays a one of a kind part in the approach of innovative advancements. It concentrate around two jobs improvements of pictorial data for human translation processing of picture data for storage, transmission and representation for self-autonomous machine observation. Likewise people have begun to utilize picture capturing machines never as with the approach of advanced devices and circuit TV. Since the application of picture processing is huge, broad work also, research about have been doing in using its potential to and to make new inventive applications Facial identification and recognition has been the latest of the application derived from this innovation in [3], which is a standout amongst the most verification strategies in human face recognition Face is a common multidimensional structure and needs great computational investigation for identification. Biometrics strategies have been utilized for a similar purpose since quite a while now. In spite of the fact that it is powerful, it is as yet not totally solid for purpose of recognizing a human. Attendances of each and every student are being kept up by each school, college and University. Observational proofs have demonstrated that there is a noteworthy relationship between students attendances and their scholarly performance in[2]. There was additionally a claim expressed that the students who have poor attendance records will by and large connect to poor maintenance. In this manner, staff needs to keep up legitimate record for the attendance. The manual attendance record framework isn't effective and requires more opportunity to arrange record and to measure the normal attendance of every student Consequently there is a necessity of a framework that

will take care of the issue of student record design and student normal attendance calculation. One other option to make student attendance framework automatic is given by facial detection and recognition.

II.RELATED WORK

1. Iris-Recognition Based Attendance System

Iris is another bio-metric technique that can be utilized for Attendance Frameworks. In the researchers have proposed Daugmans methodology based Iris recognition framework. This framework utilizes iris recognition administration framework that does extracting the picture of iris recognition, extraction, putting away and matching in [5]. Be that as it may, the trouble occurs to lay the transmission lines in the places where the topography is not good. In researchers have proposed a framework in light of continuous face recognition which is dependable, secure and quick which needs change in various lighting conditions.

2. Ear Detection System for Attendance of Class' Students

Two scientists Visar Shehu and Agni Dika proposed in a framework which presents a attendance marking framework, which incorporates PC vision and ear recognition methodologies into the procedure of attendance management. The framework is designated utilizing a non-intrusive advanced camera introduced on a classroom, which filters the room, recognizes and extracts all ears from the gained pictures in [10]. After ears have been extracted, they are contrasted and a current database of student pictures and upon fruitful recognition a student attendance list is created and saved money on a database. This paper tends to issues, for example, real time ear detection on conditions with

numerous articles, ear recognition methodologies and also social and educational issues with the applied procedures.

3. RFID Card Based Attendance System

In PAN Xiang depicted work procedure of a framework as given below: At the point when a man needs to enter the entrance control framework, he utilized the RFID card to swiping card by non-touch way in [1]. The framework requires the data in the card and then the video camera is started to take photographs of the individual. At that point the face can be identified in a brief short time. The identity data in the card is matched with the data from the database and the relating face information will be gotten. On the off chance that the personality data and the face information are altogether matched to the data from the database, the individual will be passed in [9]. Else he can't enter. The administrator can do the manage work, for example, question the records.

III. PROPOSED SYSTEM

In this proposed framework, the framework is instantiated by the web application. After it triggers then the framework begins processing the picture for which we need to check the attendance. Image Capturing stage is one in which we capture the picture in [6]. This is essential stage from which we begin instating our framework. We capture a picture from a camera which is transcendently checked for certain requirements like lightning, separating, thickness, and facial expressions. The captured picture is fearless for our requirements. When it is resolute we ensure it is either in png or jpeg design else it is changed over. We take people various frontal stances with the goal that the precision can be accomplished the greatest extent. This is the training database in which each individual has been ordered in view of names. For the captured picture, from an each object we recognize just frontal faces from viola-Jones methodology in [12] which identifies just the frontal face posture of an each person from the captured picture. This identifies just faces and removes each different part since we are investigating the features of just faces. These recognized faces are put away in the test database for further enquiry. Features are extricated in this extraction stage. The identified bounding boxes are additionally questioned to search for feature extraction and the removed features are stored in matrix.

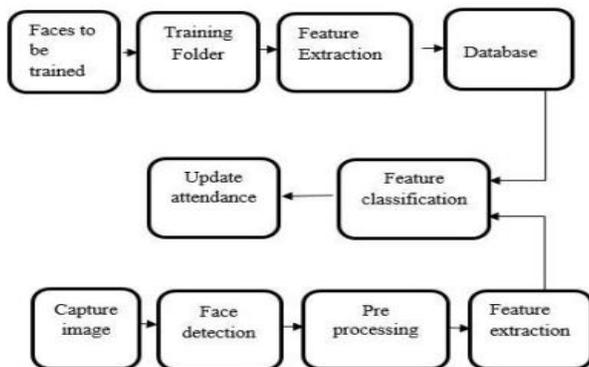


Figure.1. System Overview

1. Feature Extraction

In [12] the real time object is detected by using various technique but here feature extraction will be done by using pca

algorithm For each recognized stage this feature extraction is finished. Features we look here are Shape, Edge Skin Color and face geometry,. Face is perceived once we finished extracting features in [7]. The feature which is as of now prepared with each individual is compared and the recognized faces include furthermore, if the two features matched then it is recognized. When, it detects it will update sin the student attendance database. Once, the procedure is finished the testing pictures gets erased since, we are attempting to plan it for both the accuracy and in addition productivity co-effective After the face detection step, student face patches are extracted from pictures. Specifically utilizing these patches for face recognition have a few weaknesses; in the first place, each patch for the most part contains more than 1000 pixels, which are too vast to manufacture a strongest recognition framework. Second, face patches might be taken from various camera alignments, with various face feelings, illuminations, and may experience the ill effects of occlusion and clutter in [8]. To beat these disadvantages, feature extractions are performed to do data packing, measurement reduction, remarkable quality extraction, and noise cleaning. After this progression, a face patch is generally changed into a vector with fixed measurement or an arrangement of fiducially focuses and their relating locations. In a few references, feature extraction is either incorporated into face detection or face recognition.

2. Approach

We have examined different techniques for automatic attendance framework in the past area. Every one of the strategy has a few issues, for example, illumination issue, head posture issue, various face detection, and so on. So this paper proposes another strategy to beat every one of these issues. This technique utilizes Viola and Jones methodology for face detection as it is an effective face detection strategy. This technique can likewise detect various faces and can be effectively utilized as a part of a classroom. At that point the detected faces are cropped from the captured picture and afterward verified with face database. For this, a proficient Eigen Face algorithm in [11] is utilized which can overcome the illumination and head posture issue. Also, the recognition rate can be expanded utilizing this strategy.

3. Principal Component Analysis (PCA)

PCA was invented by Karl Pearson in 1901. It involves the mathematical method to transforms an amount of probably interrelated variables into a numeral of unorganized variables is called the principal components, related to original variables by an orthogonal transformation. The transformation can be defined as that the first principal component has as high variance as it is possible and for every succeeding component thus has the highest variance conceivable under the imperative that it be orthogonal to the former components in [2].

Steps Used in PCA Algorithm

Step1: Acquire preparing set of 'N' number of pictures at the first stage. In this technique the pictures are of 92*112 pixels each.

Step2: Calculation of the eigenface from the "N" preparing set pictures keeping just couple of M pictures that is relate to that of the most highest eigen values. The M pictures indicate the "face space". At the point when new faces experienced, the "eigenfaces" can be recalculated in like manner.

Step3: The relating distribution of the "M" dimensional weight space for each known individual is calculated by representing their particular face pictures onto "face space".

Step 4: Compute set of the weights anticipating the information picture or info picture to M "eigen faces".

Step5: Determine if the given picture is face picture or not by checking to the closeness of given picture or picture to "face space".

Step 6: If the picture is sufficiently close, at that point characterize the weight design as either an unknown or as a known individual in view of measured Euclidean separation.

Step7: If the picture is adequately sufficiently close at that point refer to the recognition is effective and give appropriate data about recognized face from the database which hold information of faces.

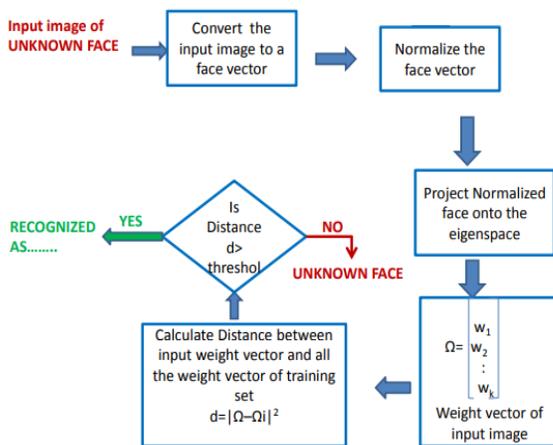


Figure. 2. Flow chart of the algorithm

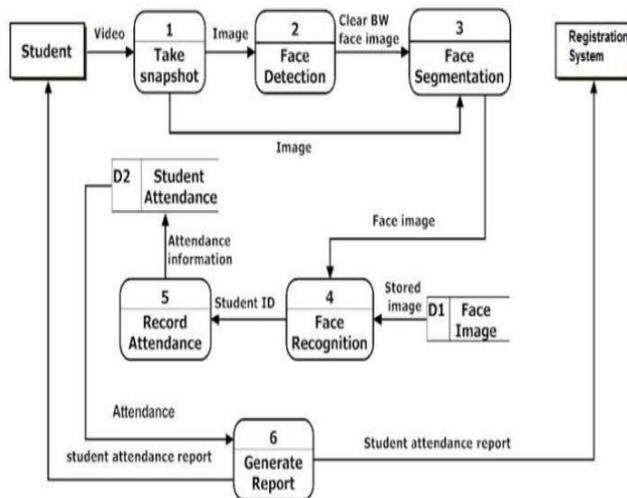


Figure. 3. System Architecture

V.RESULT DISCUSSION

Face detection and recognition has been a challenging task due to unconstrained condition In our project "Automated Attendance Management system" using Viola Jones face detection method; Local Binary Pattern algorithm for face

recognition and Yale database techniques are being used which will give us an overall efficiency of 83.2%.

Table.1. Performance evaluation of proposed system

No of faces	No of successfully detected faces	No of successfully recognized faces	% of correct recognition	No of false acceptance	% of false acceptance	No of false rejections	% of rejections
10	10	9	90%	0	0	0	0%
20	19	18	90%	0	0	1	5%
30	29	28	93.33%	0	0	1	3.33%
40	38	36	90%	0	0	2	5%
50	47	45	90%	0	0	2	4%
60	55	52	86.66%	1	1.92%	2	3.33%
70	63	60	85.71%	1	1.67%	3	4.23%
80	69	67	83.75%	2	2.98%	5	6.25%
90	78	75	83.33%	2	2.67%	6	6.67%

VI.CONCLUSION

This task concentrates on building up a computerized attendance system. It reduces time and effort, particularly on the off chance that it is an address with maximum number of students. This attendance framework demonstrates the utilization of facial recognition procedure for the reason for student attendance and for the further procedure this record of student can be utilized as a part of exam related issues. It is difficult to identify faces having similar facial features. The framework can be reached out to react to the nearness of newcomers in the classrooms. Additionally, intends to check attendance without the mediation of teacher in a classroom i.e. consequently marking attendance at the start of consistently can be implemented. It can be reached out to video surveillance to recognize fakes at huge population areas, for example, transport stands, theaters, railroad stations where in by face recognition procedures, the identity of the offenders can be found.

VII. REFERENCES

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