Automated Face Recognition for Student Attendance Monitoring System Using PCA Algorithm

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Abstract:
Human face recognition and detection is a very important technology within the biometric verification and it's been utilized in numerous applications like interaction with human-computer and security, video monitor system. This paper primarily describes concerning the group action for college kids. for each library, faculties and schools group action is needed. Historical methodology for taking group action is lecturer occupation name of a student and capture the group action in a very sheet. It's a time waste method. it's a tedious task to proof entire student's gift in a very schoolroom. to stay away these losses, we tend to use automatic group action system. The designed system describes a way like once he\she enters the category area and it blots the group action by uprooting the image mistreatment PCA (Principal component Analysis) rule. This method can document the group action of the coed at school area setting mechanically. the coed information is collected. The coed information contains students name, photos & their roll numbers. it stores a additional introduction every student with value more highly to each course and additionally initiate a detail of every student group action. Mistreatment SMTP protocol, the category group action information is sent to folks and similarly as college

Keywords: face detection and recognition, Principal component analysis, SMTP protocol, Image mistreatment.

I. INTRODUCTION

Image processing is a type of signal processing where the input is taken in the form of an image, it may be a video frame or a photograph; the result of image processing leads for an image or a group of parameters or characteristics which are related to its image. Image processing is sorted into 2 types. They are,

1. Analog image processing
2. Digital image processing

Analog image processing is a type of image processing where the task is based on two dimensional analog signals. Digital image processing is mainly based on algorithms of a computer or it process the digital images using image processing. Digital image processing mainly refers to the processing of a two-dimensional image by its digital computer. Students attendance take a note and plays a vital role in each and every university, college and school. Attendance of a student can be sorted into 2 types. They are

1. Manual Attendance System
2. Automated Attendance System

The manual attendance system is a challenging issue for a lecturer to authenticate and preserve for every student record in a huge class and it takes much time for calculating each and every student average of their attendance. The automated attendance system will extricate the image of a student's face as soon as the student enters in to the class and it robotically spots the attendance. This project is mainly based on biometric face Recognition technique. Facial Recognition algorithms determine facial expression by extracting landmarks, or options, from a picture of the subject's face. for instance, AN formula could analyze the relative position, size, or form of the jaw, cheekbones and eyes. These options are then wont to hunt for alternative pictures with matching options.

Recognition algorithms are Principal component Analysis (PCA) exploitation Manfred Eigen faces, Linear Discriminate Analysis, Elastic Bunch Graph Matching exploitation the Fisher face algorithmic rule, Hidden mathematician model, Multi-linear mathematical space Learning exploitation tensor illustration, and somatic cell impelled dynamic link matching.

2. SYSTEM OVERVIEW

Face recognition system is to spot an individual victimization his face image. Face recognition module that acknowledges the individual student's face and update the coed attending info mechanically.

The first step is that, the workers and student category representative are given their own Username and parole to Log-in. Next step is, the coaching image and their options are hold on within the info. Then, testing image options are compared with the coaching pictures. Once the image is known, the attending is going to be registered. Finally, the attending details of the coed are sent to workers and parent through E-Mail

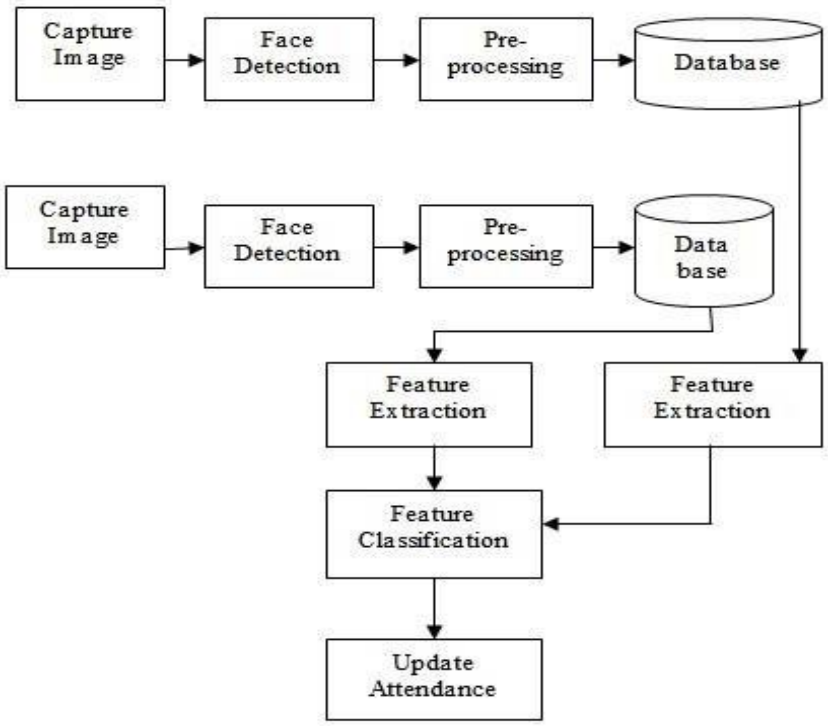

Fig. 1: architecture for student attendance monitoring system

3. METHODLOGY:

a. Authentication Process

The login part is provided for the Lecturer and student category Representative. Login name and arcanum is given to each the lecturer and Representative. Within the absence of lecturer, the representative will login into the system. when log-in the input image is captured and sent for feature extraction.

Fig 2 Authentication process

b. Personal Information Details:

Information concerning staff's like their name, email id, mobile range, subject they're handling and their department. In student info the name every of every student within the category are displayed with each student's image. during this module, we've got update and clear button. Update button is employed to require the scholar group action details and clear button is employed to clear the previous group action details.

Fig. 3 Personal Information details

c. Data Update Process:

Once the update attending button is clicked then the testing and coaching image options are extracted and classified. If geometer distance worth is minimum then student attending is registered. the share of the individual student is calculated.

d. Image Extraction:

Feature Extraction is applied to each coaching and testing pictures. it's wont to extract the options of image. Feature Extraction is finished victimization PCA rule. PCA is employed in Face recognition for locating patterns. chemist faces approach may be a principal part analysis technique that is employed to explain the variation between face pictures. chemist faces approach is employed thanks to its simplicity, speed and learning capability. Victimization chemist face technique, the pictures are drawn as vectors rather than victimization Matrix illustration.

e. Image Classification:

The Extracted image from feature extraction is distributed to the Classification Module. In feature classification the feature of each coaching and testing image are compared. The distinction between the values of coaching and testing image is calculated mistreatment Euclidian distance. the worth of Euclidian distance ought to be minimum that's between zero to one.

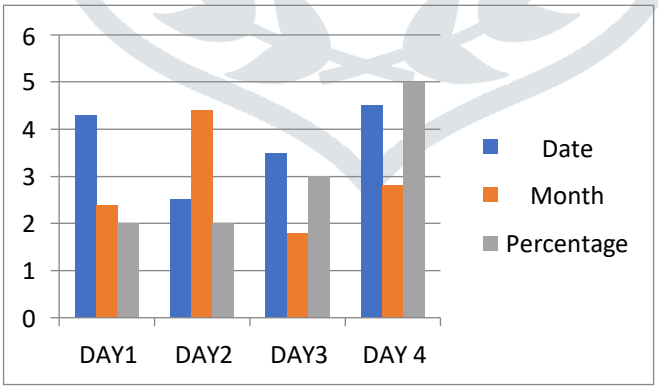

Fig. 4 Image Extraction and Classification

Fig. 5: Updating Database

4. Methodology of PCA:

PCA could be a helpful applied mathematics technique that has found application in fields like face recognition and compression, and could be a common technique for locating patterns in knowledge of high dimension. chemist faces approach could be a principal element analysis methodology, within which a tiny low set of characteristic photos, are wont to describe the variation between face pictures. chemist faces approach appears to be associate adequate methodology to be employed in face recognition thanks to its simplicity, speed and learning capability.

Figure.6 Comparison of Monitoring System

date	29-1-19	30-1-19	31-1-19	1-2-19
day	Tuesday	Wednesday	Thursday	Friday
time	9:30to10:30	10:30to11:30	12:00to1:00	2:00to3:00
Nithin		×	×	`
Nikhitha				×

Table.1 Routine monitoring Process

5. Alogrithm Steps:

1. All coaching set pictures are resized and born-again into one vector and keep within the info.
2. Then testing image is resized and born-again into one vector.
3. Mean image of all coaching set pictures and testing pictures are calculated.
4. Then the mean image is deducted from every image of the coaching set yet as from the take a look at image. once subtraction we are going to get new pictures known as as distinction pictures.
5. All distinction pictures of coaching set yet as testing image are born-again into a column vector i.e. column-wise concatenation of all pictures.
6. Then mistreatment variance matrix the eigenvector and eigenvalues are calculated. every eigenvector belongs to at least one of the Eigen face.
7. mistreatment product of every Eigen pictures with the distinction pictures can get the burden vector of every category yet because the weight vector of the take a look at image.
8. Then the burden of the take a look at image is deducted from every weight vector of the distinction image.

6. Conclusions and Future Work:

In order to get the group action of individual student, this paper proposes the automated group action system supported face recognition technique victimization Personal part Analysis (PCA) rule. The system can record the scholar group action once he\she enters and exit the schoolroom mechanically and additionally offer extra data to college by maintaining a log report for entry and exit time. victimization SMTP protocol, student's group action is shipped to their oldsters through mail. By victimization this methodology the calculated group action are more practical and time saving. examination to manual group action system this provides additional reliable answer. In additional work, our system will be utilized in mobile based mostly face recognition. It will be enforced in real time applications victimization CCTV camera. rather than PCA rule, numerous recognition algorithms will be enforced for effective results.

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