Attendance Management System based on Face Recognition

Gaurav Bhardwaj[1], Deepak Dua[2], Hardik Bhatnagar[3]

[1,2,3] Under Graduate
[1,2,3] Department of Computer Science and Engineering
[1,2,3] Krishna Engineering College, Ghaziabad.

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Abstract - In this digital era, the face recognition system plays an important role in nearly every sector. Face recognition is one of the principally used statistics. It will be used for security, authentication, identification, and possesses more benefits. Despite getting low accuracy, it's being widely used thanks to its contactless and non-invasive method. What is more, a face recognition system also can be used for attending marking in schools, colleges, offices, etc. this method aims to create a category attending system that uses the idea of face recognition as the existing manual attending system is time intense however there is also possibilities of proxy attending. Thus, the necessity for this method will increase. this method consists of 4 phases- information creation, face detection, face recognition, attending change. Information is formed by pictures of the scholars at school. Face detection and recognition are performed victimization Haar-Cascade classifier and native Binary Pattern histogram algorithm severally. Faces are detected and recognized from live streaming video of the schoolroom. Attending is armoured to the various college at the top of the session."

Key Words: Face Recognition; Haar-Cascade classifier; Local Binary Pattern Histogram; attendance system;

1. INTRODUCTION

The conventional technique of attending marking may be a long task in schools and colleges, it's additionally an additional burden to the colleges. Institution agency ought to mark attending by manual vocation the names of scholars which could take concerning five minutes of the entire period of lecture and there can be some possibilities of proxy attending too. Therefore, several institutes started deploying several different techniques for recording attending like the use of frequency Identification (RFID) [3], iris recognition [4], fingerprint recognition, and so on. However, these systems are queue primarily based which could consume longer and are invasive in nature. Face recognition has set a very important biometric feature, which may be simply available and is non-intrusive. Face recognition-based systems are comparatively ignorant to varied facial expressions. Face recognition system consists of 2 categories: -verification and face identification. Face verification may be a 1:1 matching method, it compares face image against the templet face pictures and whereas maybe a 1:N issues that compare a question face pictures [1].

The purpose of this method is to style an attending system that is predicated on face recognition techniques. Here the face of a private is thought-about for marking attendance. Nowadays, face recognition is gaining additional quality and has been widely used. during this paper, we tend to project a system that detects the faces of scholars from live streaming video of schoolroom and attending are marked if the detected face is found within the information. This new system can consume a lot less time than compared to ancient strategies.

2. LITERATURE SURVEY

Authors in [3] projected a model of an automatic attending system. The model focuses on however face recognition incorporated with frequency Identification (RFID) observe the approved students and counts as they get in and obtain out type the schoolroom. The system keeps the authentic record of each registered student. The system additionally keeps the info of each student registered for a selected course within the attending log and provides necessary information in step with the necessity.

In this paper [4], authors have designed and enforced an attending system that uses iris statistics. Initially, the scholar was asked to register their details in conjunction with their distinctive iris templet. At the time of attending, the system mechanically took the category attending by capturing the attention image of every student, recognizing their iris, and sorting out a match within the created information. The image was internet-primarily based.

In [5], authors projected an attending system supported biometric authentication. The algorithms like Viola-Jones and histogram of minded Gradients (HOG) options in conjunction with Support Vector Machine (SVM) classifier were accustomed implement the system. numerous real-time situations like scaling, illumination, occlusions and cause thought-about by the authors. quantitative chemical analysis was done on the idea of Peak Signal to Noise magnitude relation (PSNR) values and was enforced in Python.

Authors in [6] researches to urge best biometric authentication algorithm (Eigenface and Fisherface) provided by the Open CV two.4.8 by scrutiny the Receiver operational Characteristics (ROC) curve then enforced it within the attending system. supported the experiments distributed during this paper, the mythical creature curve tested that, Eigenface achieves higher result than Fisherface. System enforced victimization Eigenface formula achieved an accuracy rate of seventieth to ninetieth.

In [6], authors proposed a method for a student attendance system in the classroom using face recognition technique by combining "Discrete Wavelet Transforms (DWT) and Discrete

Cosine Transform (DCT)". These algorithms were used to extract the features of the student's face followed by applying Radial Basis Function (RBF) for classifying the facial objects. This system achieved an accuracy rate of 82%.

3. PROPOSED SYSTEM

All the scholars should register themselves by providing the required details and then their pictures are captured and hold on within the dataset. throughout every period, faces are detected from live streaming video of the schoolroom. The faces detected are compared with pictures gift within the dataset. If match found, attending marked for the various student. At the top of every session, a list of absentees armoured to the various college handling the lecture.

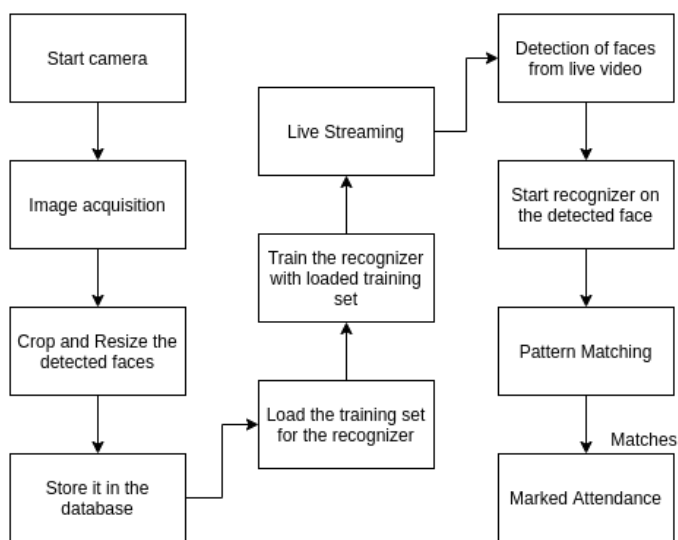The system design of the projected system is given below

Fig-1: System Architecture

Typically, this method often divided into four stages,

I. Dataset Creation
Images of scholars are captured. Multiple pictures of a single student are noninheritable with varied gestures and angles. These pictures endure pre-processing. the pictures are cropped to get the Region of Interest (ROI) which can be additionally utilized in the recognition method. "Next step is to size the cropped pictures to the explicit component position. Then these pictures are regenerate from RGB to greyscale pictures." then these pictures are saved because of the names of the various student inside a folder.

II. Face Detection
Face detection is performed by Haar-Cascade Classifier with OpenCV. Haar Cascade formula must be trained to sight human faces before it is used for face detection. this is often known as feature extraction. The haar cascade coaching information used XML file haarcascade_frontalface_default. The haar options are shown in Fig.2. are used for feature
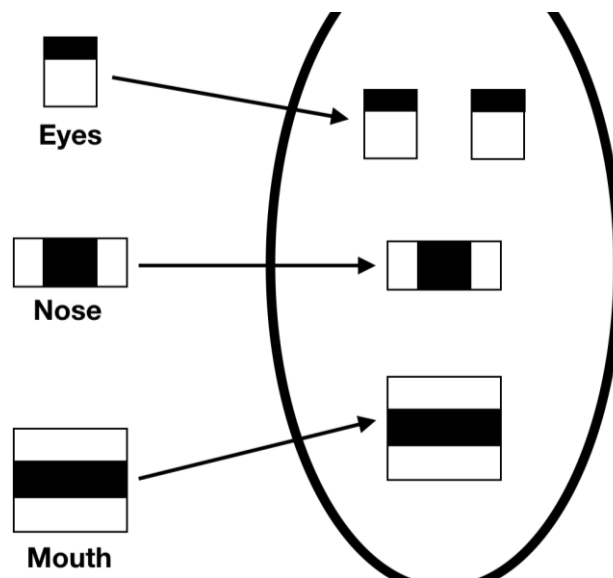
extraction.

Fig-2: Haar Features

III. Face Recognition
The face recognition method may be divided into 3 steps- prepare coaching knowledge, train face recognizer, prediction. Here coaching knowledge is going to be the photographs gift within the dataset. they're going to be allotted with associate degree whole number label of the scholar it belongs to. These pictures area unit then used for face recognition. The face recognizer employed in this technique is the native Binary Pattern bar chart. Initially, the list of native binary patterns (LBP) of the entire face is obtained. These LBPs area unit reborn into decimal range then histograms of all those decimal values area unit created. In the end, one histogram going to be shaped for every image within the coaching knowledge. Later, throughout the recognition method bar chart of the face to be recognized is calculated then compared with the already computed histograms and returns the simplest matched label related to the scholar it belongs to [8].

IV. Attendance Updating
After the face recognition method, the recognized faces are marked as present within the stand out sheet and also the rest are marked as absent and also the list of absentees are mailed to the individual schools. schools are updated with a monthly group action sheet at the last of each month.

4. RESULT AND DISCUSSION

The users will use the system employing a graphical user interface. Here users are primarily supplied with 3 totally different choices such as student registration, college registration, and mark attendance. The scholars are purported to enter all the required details within the student registration type. After clicking on the register button, the net cam starts

mechanically and window as shown in Fig.3. pops up and starts police work the faces within the frame. Then it mechanically starts clicking photos till sixty samples are collected or CRTL+Q is ironed. These pictures then are pre-processed and keep in the training pictures folder.

The faculties are purported to register with the several courses codes along with their email-id within the college registration type provided. this is often necessary as a result of the list of absentees are ultimately armoured to the several faculties.

Fig-3: 60 Samples

In each session, various professors should enter their course ID. Then once submitting the course ID, the camera can begin mechanically. The Fig.4. shows the face recognition window wherever 2 registered students area unit recognized and if just in case, they weren't registered it'd have shown 'unknown'. By pressing CTRL+Q, the window closed and group action are updated within the standout sheet and names of absentees are armoured to the various professors.
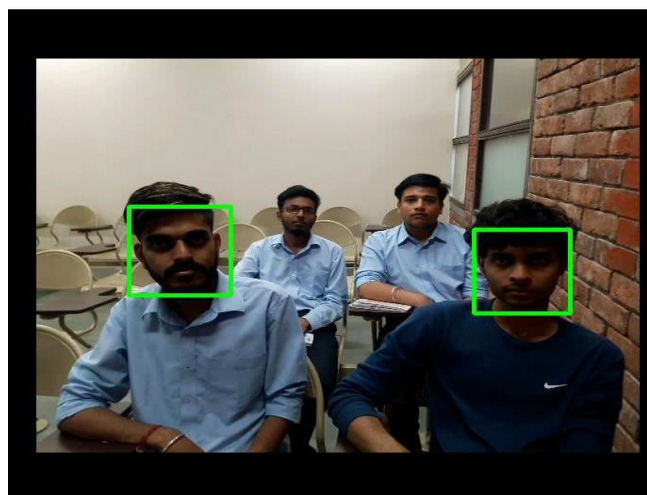

Fig-4: Face Recognition

Id	Name	Date	Time
1102	['Gagan']	5/18/2021	5:10:23 PM
1103	['Gaurav Bhardwaj']	5/18/2021	5:10:40 PM
1104	['Deepak Dua']	5/18/2021	5:11:00 PM
1105	['Hardik Bhatnagar']	5/18/2021	5:12:20 PM

Fig-5: Attendance Sheet

Fig-5. shows the attendance of the student in an excel file.

5. CONCLUSIONS

This system styles to make an effective class attendance system using face recognition methods. The proposed system will be able to mark the attendance of the student via face Id. It will detect the faces via webcam and then acknowledge the faces. After recognition, it will mark the attendance of the recognized student and update the attendance sheet.

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