User Authentication Using Facial Recognition

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ABSTRACT: Now a days face is the crucial part which uniquely identifies a person using their facial characteristics of a person As coming to biometrics facial recognition system can be implemented in attendance system in an organization or institution as attendance system in recent days is calling out roll numbers and mamrking is the time consuming task and it is a challenging task and it should not be accurate and it is very impossible to identify the correct persons are responding are not in a large environment and with several branches in a seminar hall so we want to implement an automated attendance system using facial recognition technologies because of it two reasons one is it is the smart way and a faster techniques to detect and identify all background effects like brightness,illumination etc.
KEYWORDS: Biometrics,Face recognition and detection,attendance,database.

I.   INTRODUCTION:

The persons in image or video can be identified using facial recognition technology systems and it is type of biometric systems and other biometrics are voice,fingerprint,iris technologies and it can be applied many parts like image and film processing and criminal ideitificationwhere the cctv footage will detect the faces of criminals from the crime scene and compare with the criminal database to recognize them.we can implement any system over other biometrics are due to its accuracy and quality improvent over time and due to its smart way and takes less time and detects very fast.and moreover in manual process of recording the attendance in a larger environment to mark the attendance is a major task .as this is fastest growing research area and implemented in many domains this facial recognition systems can be implemented in many security systems like attendance in institution and banking sector to record the attendance automatically and in lockers of bankas this automated attendece systems are generally based on biometric data like smar cards and web based ones are widely used in many oraganizations.As

many systems are proposed for this attendance system in one of the proposed system which uses QR CODE to record and track the attendance of an employee and it is responsible for some mobile phones and different desktop systems .Now a days institutions are concerned about the their students regularity in attending to classes which can be able to affect the students overall performance in the academic year due to its irregularity to school as coming to the traditional methods which institions are following is a time consuming task and a difficult task to identify the students in a larger environment where several branches are present and years.Hence there is requirement of Computer based student attendance management system which will assist the faculty for maintaining and recording the attendance automatically in a database. Hence this system can be implemented in a field where attendance plays a major role as this system is designed using python platform.

EXISTING SYSTEM: In recent days the student attendence are taken manually by calling and marking the attendance in a sheet or by manually is a time consuming task and it is difficult to identify correct persons are responding or not in a large environment and with distributed branches.The existing attendance system is not provides a high level of security when compared to the traditional authentication methods. However, these systems offer some disadvantages as well.Most of the devices are unable to enroll some small number of users, and the performance of the system.

OBJECTIVES: The main objective of this system is to present an automated attendance system using facial recognition technology in any back ground effects like illumination,brightnessetc.and to increase the correctness of present students over a larger environment and to reduce manual process errors by providing an automated attednece system and to provide a security in recording the attendance of a system in a database to to provide flexibility and correctness to the institution.

PROPOSED SYSTEM:we need to design an computer based attendance system for institutions an automated attendance system based machine learning technique face recognition technology the system which employs the paul viola jones for face detection and a lpbh algorithm which extract the features in detection of face and haar cascade algorithm can be used to detect the face and a cascade classifier can be used detect the object or not can create a database to record the attendance of students and automatically updates the attendance and whil during recognition the system which will recognize the faces accurately and can save the data in the database if it does

the recognize the database will save as empty and the faculty can easily filter the attendance of students in a database and can design a small par the to send the recoded students database database via email and can faculty will save the database for future purpose.the FIG:1 clearly describes the prosed system architecture.
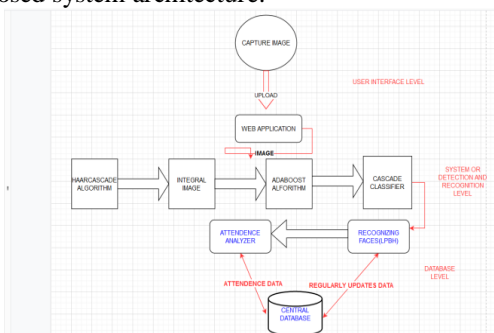

FIG:1 Prosed system architecture

SYSTEM REQUIREMENTS:
SOFTWARE REQUIREMENTS:
➢ Python environemet—pycharm
➢ Visual studio installer — upto data preferred
➢ Coding languge -- python
HARDWARE REQUIREMENTS:
➢ Processor - i5(8th generation)
➢ Ram - 4gb
➢ Hard disk - 100gb

METHDOLOGY: The proposed methodology is depicted in FIG:1 the task of the prosed system is to capture the students photo in a live or video.in this face capture simply defined as the image of students captures and will sent to the detecting the image using paul viola jones algorithm.the students should be captured in such a way that its detects all the features of the image including its back ground effects like illumination,position of person and soon. And will store in a database.if its does not detect the properly of students it will default save

as empty in the database.if it detects properly it will store with correct id in which the user had used during its enrollmet of the images.as depicted in Fig:1 the systems architecture basically consists of 3 layers

USER INTERFACE LAYER:AS depicted in FIG:2A is an application or user interface layer also called as an capturing face layer in this where the user will capture the frames using a web app that runs on almost all platforms before this an enrollment must be done using the basic details by id or batch as primary key to detect the person.
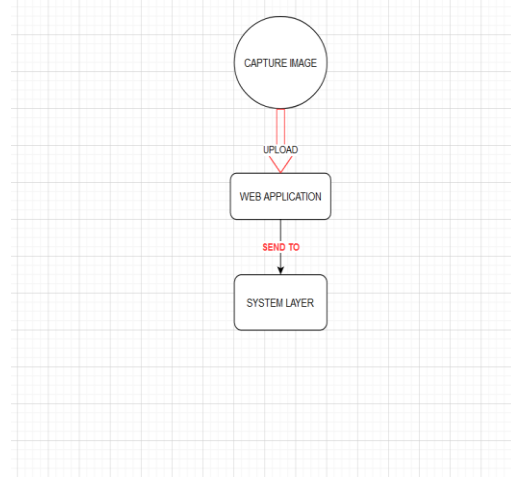

FIG:2A USER INTERFACE LAYER

SYSTEM LAYER:AS depicted in FIG:2B In this layer where the processing is done that is the face recognition and detection part at the server side using the detection and recognition algorithms.
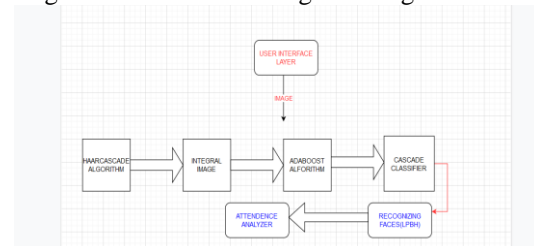

FIG:2B SYSTEM LAYER

DATABASE LAYER:AS depicted in FIG:2C It is a last layer and is a centralized database system and it consists of students database during enrollment intillay it takes frames which system takes and crop it stores in a database or in a folder and stored images are used during the recognition part the results of the proposed system are compared with the images in the database after successful comparision it will automatically updataes the database of recorded students database.
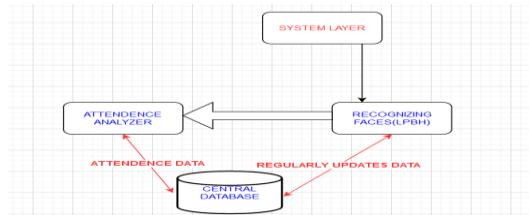
FIG:2C DATABASE LAYER

FACE DETECTION:

HAAR CASCADE ALGORITHM:Basically it is a classifier which is used to detect the objects and it is based on the haar wavelet technique which is used to anlyze the pixels while encoding of faces as rectangle around the faces and compute the distance between two images and it basically uses a technique called "INTEGRAL IMAGE" to compute the features that are detected and adaboost algorithm can be used to detect the small features around a group of people and described in FIG:3A and basically it is traines by giving some input faces and compares with the images in database.

FIG:3A HAAR CASCADE FACE DETECTION IN LIVE

ADABOOST ALGORITHM:Basically it is a machine learning based approach and it is used to boost or make the accuracy of the performance of any algorithm like detection of gender is male or female of how much accuracy is recognizing it is how much percentage it can be able to recognize the person. During in attendence system it is used while taking the attendence of a system it finds the best features of images that are occurred during the enrollment and discards the irrelevant features. And the used to detect the faces in image or video.

INTEGRAL IMAGE:Here during enrollment of images when images are scanned it will form a rectangle and inside this the pixels are arranged to reduce the computation of pixels viola jones introduced a techniques calles integral image the value at pixels(x,y) are computed using the pixels at left and above to the x,y.the operation can be described in the following figure FIG:3B
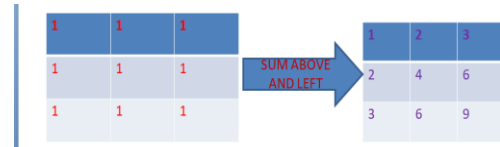

FIG: 3B OPERATION OF INTEGRAL IMAGE

CASCADE CALSSIFIER: Basically it is a machine learning based approach where it is trained from a two sets one is images with faces also called positive images and images without faces also called negative images during capturing one person can capture the images with a new size and changing the position of a person every time during this cascade classifier it mainly concentrates in removing the non faces from a set of faces everytime.the basic operation is describes in FIG:2C since the computation is high for every image during the classifier as distance between the images is less more the match is and brings out the most feasible area.
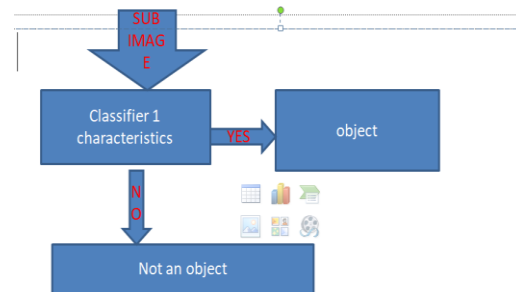

FIG: 3C OPERATION OF CASCADING CLASSIFIER

DATA SET GENERATION: here the faces are stored in a database which are detected during enrollment of images including its features along with the name and these images are later used in recognizing the persons and marking the attendence of a person and will save in a database.

FACE RECOGNITION: here we can use any algorithm to recognize the face of a person like lpbh which mainly has accuracy in detection performance and can recognize the accuracy of the person including its performance and positionetc. Cropped facial images are fed into the face recognition algorithm to detect the faces.it is mainly used to extract the features in a detected images which are occurred during enrollment it is able to recognize the face of a person due to its performance it is able to recognize the face of a person from both front and back end of the person and face recognition basically operates in two modes verification or authentication of image.so

during attendence marking it compares the input facial images with the face images in the database.

DATABASE GENERATION: After successfully recognizing the faces the images will be now feteched into the attendence system to mark the attendence of corresponding individual with data and time of which the image is recognized.after classification is done using haarcascade classifier a database is created and will enter the password created by the user during application designing and will be sent to corresponding faculty via Email using SMTP protocol.

RESULTS: The results of the proposed system are shown in FIG:5 where you can choose any options first you need to generate a database and then used to enroll the data and you can click to attendence to record and will save in a database and can the database via email and will save the data and it cannot able to change the data and it has security and it avoids the proxy attendence in a larger environment.and we make unique constraint as college id if the id is already enrolled it will not enroll again and will give the error already exists and unique constraint failed and in FIG: 5A you can see the attendence data in a database and will save the data in a database and can be able to easily filter.
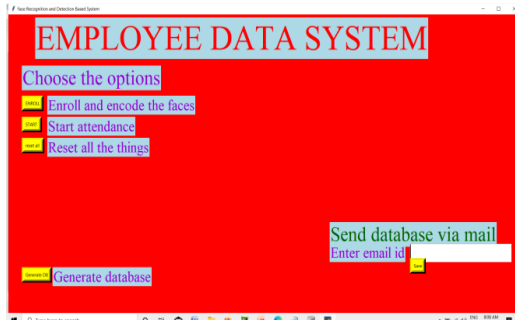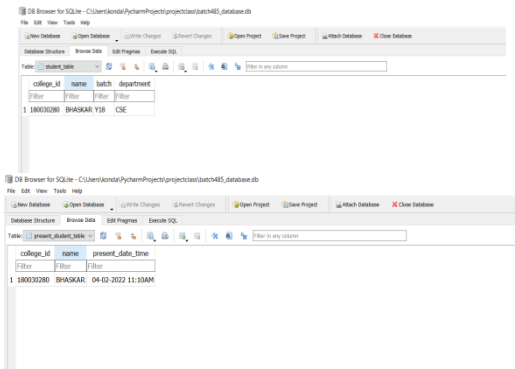

FIG:5 HOME PAGE OF SYSTEM

FIG: 5A ATTENDENCE IN A DATABASE

II.   CONCLUSION:

The proposed system uses machine learning techniques to make the atteedence system more accurate and it is a cost effective which only requires a camera and it is secure as only users or teachers only can manipulate the records and easy for the users and it is a user friendly system we had developed using the TKINTER GUI design as it is a object oriented interface as it well interacts with the user because and attractive graphical user interface helps to create a good application as it is the user friendly and fastest GUI to design. And complete details found in https://drive.google.com/drive/folders/1gD41Qk5p FITPOyWr8CtZzA02lzu8cSAp?usp=sharing

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