

Modern Attendance System by face realization using openCV python

#1 EdaraManjula, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

#2 Ms. Naga Reshma, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

#3 Mr. Chimmilikondapanaidu, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

#4 Mr. P Vijay Kumar, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

#5 Mr. Pinapala Rakesh, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

#6 Mr.K Nagarjunareddy, Dept of CSE, QIS college of Engineering and Technology, Ongole , Prakasam (D.T), A.P, India.

Abstract - With advances in computing and telecommunications technologies, digital images and video are playing key roles in the present information era. Human face is an important biometric object in image and video databases of surveillance systems. Detecting and locating human faces and facial features in an image or image sequence are important tasks in dynamic environments, such as videos, where noise conditions, illuminations, locations of subjects and pose can vary significantly from frame to frame. An automated system for human face recognition in real time background for a college to mark the attendance of their employees and students. So Smart Attendance using Real Time Face Recognition is a real world solution which comes with day to day activities of handling employees. Here multiple user faces are detected and recognised with the data base trained multiple texture based features.

Keywords: - *OpenCV, numpy module, python idle,web camera*

I. INTRODUCTION

Human beings are recognized by their distinctive facial characteristics. In the face recognition approach, given face is compared with the faces stored in the database in order to identify the person. The aim is to search out a face in the database, which has the highest similarity with the given face. In the field of bio science, face recognition technology is one among the fastest growing fields. The need of face recognition in security systems is attributed to the rise of commercial interest and therefore the development of feasible technologies to support the development of face recognition. Major areas of commercial interest comprises of bio science, law enforcement and surveillance, human-computer interaction, multimedia management (for example, automatic tagging of a particular individual within a collection of digital photographs) smart cards, passport check, Criminal investigations, access control management. However, face detection is more challenging because of some irregular characteristics, for example, glasses and beard will results in detecting effectiveness. Moreover, different sorts and angles of lighting will make detecting face generate uneven brightness on the face, which will have influence on the detection and recognition process. To overcome the issues, the system primarily used openCV based face recognition system using Haar classifiers for face. The main processing element is Raspberry pi. The pi camera is employed to capture

the image and send it to the authorized person for security purposes. The authorized person can remotely control the lock and unlock mechanism of the door using Telegram android application which is freely available on Google play store. The entry log every person is captured using pi camera and picture is sent to the email address of the prescribed user.

II. METHODOLOGY

The proposed system was built using a high performance processor i.e., open cv model which runs on a Debian based windows Operating system called python idle. Initially, the python open cv senses the presence of human at the camera. As and when a human is detected, the Pi camera captures the image of the person and sends the image to the remote user through name. Haar face recognition algorithm is run on the captured image using OpenCV in the attendance on the basis of the images saved in the system.

If the face is recognized it implies that an authorized person is trying for the door access and hence, the door lock is opened. if the face is not recognized, then the remote user can check the mail for the image of the person trying to access the door and allow or deny the access of the door through an android application- Telegram. If the user sends "allow" from the Telegram app, the door is opened and if the user sends "deny" from the Telegram app, the person trying to access the door is denied from accessing it

III. SYSTEM REQUIREMENTS

A. Hardware Requirements:

Pi Camera: Pi camera is a camera module specially designed which in built ip camera. It is an 8MP, 1080p resolution camera. It is mainly used for HD video recording and to capture still photographs. It is attached to the system port via a 15cm ribbon cable to the CSI port. While programming, Pi camera python libraries are added to access the camera.

Windows operating system:It runs with a5V DC power supply. It is a rotary or linear actuator for controlling angular, linear position, velocity and acceleration. It makes use of the closed loop control mechanism. They are used in various applications like robotics, machinery, etc.

B. Software Requirements:

OpenCV (Open Source Computer Vision): OpenCV is an open platform for programmers for real time computer vision and computations. It supports many libraries of programming functions. It is built on C++ and has bindings with Java, Python and MATLAB. It runs on a huge variety of platforms like Windows, Linux, Android, iOS, macOS, and many more. Image and video processing are two of the main applications of OpenCV.

Python idle: It is an android application used for instant messaging services. It allows exchanging of messages, photos, video files, audio files, etc., it assures end-to-end encryption between the users communicating with each other. It can be installed and used on any android devices. It is a fast, secure and an easy application.

IV. APPLICATIONS

- Banking using ATM: The software is quickly verify a customer's image.
- Security/Counter Terrorism.
- Home security: Alert the home owners of approaching unknown persons.
- To know about the entry time and attendance verification of an employee.
- In Government services like passport verification, law enforcement investigation and etc.
- Document authentication and many more.

V. METHODOLOGY

- Class room automation with multi face feature comparison and recognition system.
- Feature Extraction
- Neural Networks

ANN is the term on the method to solve problems by simulating neuron's activities. In detail, ANNs can be most adequately characterized as "computational models" with particular properties such as the ability to adapt or learn, to generalize, or to cluster or organize data, and which operation is based on parallel processing. However, many of the previously mentioned properties can be attributed to nonneural models. A hybrid approach combining AdaBoost and ANN is proposed to detect faces with the purpose of decreasing the performance time but still achieving the desired faces detecting rate. The selected neural network here is three-layer feedforward neural network with back propagation algorithm. The number of input neurons is equivalent to the length of extracted feature vector, and the number of output neurons is just 1 (), This will return true if the image contains a human face and false if it does not. The number of hidden neurons will be selected based on the experiment; it depends on the sample database set of images.

VI. BLOCK DIAGRAM

```

Python 3.5.4 Shell
Python 3.5.4 (43.5.4:3f56698, Aug 8 2017, 02:17:05) [MSC v.1900 64 bit (AMD64)]
on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: F:\Attendance_opencv\extract_embeddings.py =====
[INFO] loading face detector...
[INFO] loading face recognizer...
[INFO] quantifying faces...
[INFO] processing image 1/30
[INFO] processing image 2/30
[INFO] processing image 3/30
[INFO] processing image 4/30
[INFO] processing image 5/30
[INFO] processing image 6/30
[INFO] processing image 7/30
[INFO] processing image 8/30
[INFO] processing image 9/30
[INFO] processing image 10/30
[INFO] processing image 11/30
[INFO] processing image 12/30
[INFO] processing image 13/30
[INFO] processing image 14/30
[INFO] processing image 15/30
[INFO] processing image 16/30
[INFO] processing image 17/30
[INFO] processing image 18/30
[INFO] processing image 19/30
[INFO] processing image 20/30
[INFO] processing image 21/30
[INFO] processing image 22/30
[INFO] processing image 23/30
[INFO] processing image 24/30
[INFO] processing image 25/30
[INFO] processing image 26/30
[INFO] processing image 27/30
[INFO] processing image 28/30
[INFO] processing image 29/30
[INFO] processing image 30/30
[INFO] serializing 30 encodings...
>>>
    
```

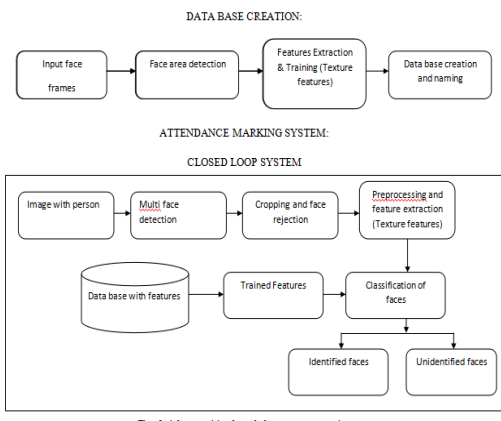


Fig: facial recognition based classroom automation

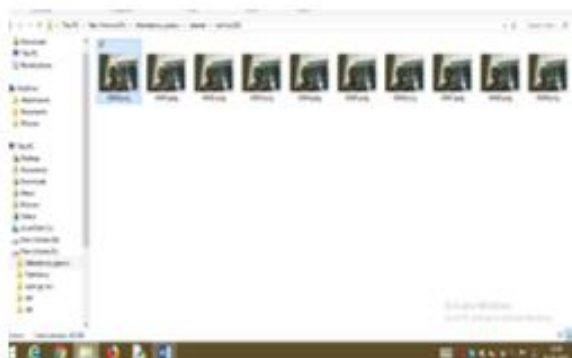
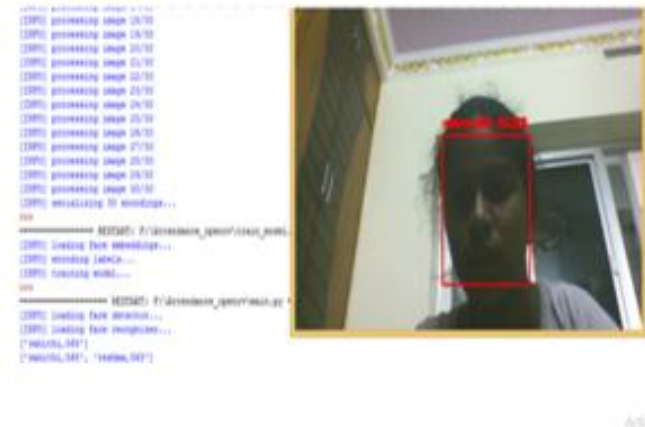
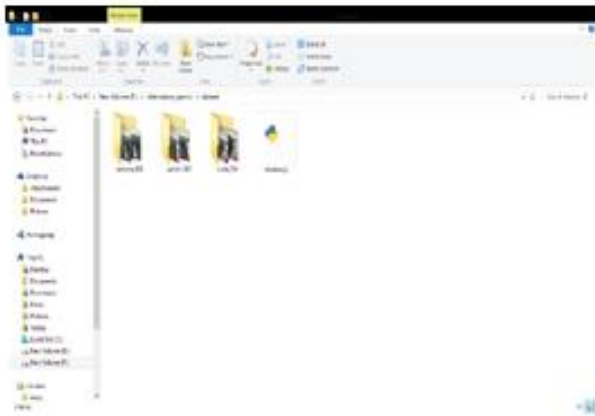
Process:-

Step 1:- creation of data base using pi camera

The below image shows the images of one of the student that we have captured.

Step 2: Extracting images from the data base: While we are extracting the files the number of images captured by each student are counted

Step 3: face recognizing and making attendance:



The above image represents that the student matched the features of the student Named Sahithi, 565 with the threshold value greater than 80%.

Step 4: unknown person:

In the below image it keeps on classifying the data from the given data set but when it does not match to any student and the threshold value is not reaching the required level then it do not display the student details as well as do not give attendance.

VII. RESULT

The result of our project is that recognition of stored images in the data base after recognizing the face the attendance will get open. If any other person comes to the frame whose image is not stored in the data base that time the image of the person will get captured and compare the image to the database person. If the other person known to the class then the class will recognize a command like "on" through idle interactive mode to unknown the person.

VIII. FUTURE ENHANCEMENT

When an unknown person try to capture instead of keep on recognizing to reach threshold value by using IOT we can generate an alert message in certain time and we can send that alert to the head of that branch

IX. CONCLUSION

The project is good example of pi camera with Open CV.A face recognition system using Python was developed. The system was programmed by Python programming language. Both Real times face recognition from specific images, i.e. stored images. The efficiency of the system was analyzed in terms of face recognition rate. The analysis revealed that the present system shows excellent performance efficiency.

X. REFERENCES

- [1]. C. Berrou, A. Glavieux, and P. Thitimajshima, "Near Shannon limit error-correcting coding and decoding: Turbo-codes." in IEEE Int. Conf. on Commun.. ICC, 1993.
- [2]. ETSI, "3GPP - TS 136.212 - Multiplexing and channel coding (R. 11)."
- [3]. I. Hussain, M. Xiao, and L. K. Rasmussen, "Erasure floor analysis of distributed It codes," IEEE Trans. Commun., 2015.
- [4]. L. Perez, J. Seghers, and D. J. Costello, "A distance spectrum interpretation of turbo codes," IEEE Trans. Inf. Theory, 1996.
- [5]. C. Berrou, Y. Saouter, C. Douillard, S. Kerouedan, and M. Jezequel, "Designing good permutations for turbo codes: towards a single model," in IEEE Int. Conf. on Commun.. ICC, 2004.