

A Novel System for Automated College Attendance using Face Recognition with GSM Notification

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Abstract - Student attendance in the classroom is very important task and if taken manually wastes a lot of time. Face is the primary identification for any human. This project describes the method of detecting and recognizing the face in real-time using Raspberry Pi. The system is at first trained with the student's faces that is called Data base creation. Whenever student enters in front of the camera it captures the image and detect the face by employing the PCA and Haar classifier algorithms. Haar Cascades was proposed by Viola- Jones for face detection. The system will automatically update the student's presence in the class to the student's database and sends message to the parents, class teachers also to the Head of department through GSM module and student information whether he/she was present/absent was taken from Excel sheet at the end of the college hours. This project also used for several different applications wherever face recognition are often used for authentication.

Keywords - Open CV, Raspberry Pi, Haar cascade, Face recognition, Viola-Jones framework, PCA Algorithm, Data base, GSM module.

I. INTRODUCTION

Present days attendance system is manual. It wastes a considerable amount of time both for teachers and students. Still there are chances of getting mistakes if the attendance was taken manually. Manual attendance may have human error. Face is that the essential recognizable proof for any human. So automatic attendance method can increase the reliability. To make it obtainable for each platform we've chosen the Raspberry pi for face recognition. This module may be utilized for various applications wherever face acknowledgment may be utilized for validation. In this planned system we tend to take the attending mistreatment face recognition that acknowledges the face of every student throughout the working hours of the college.

II. LITERATURE SURVEY

- a) Navesh Sallawar, Shubham Yende, Vaibhav Padgilwar, Vishal Kale, Parag Gorlewar Gaurav presented a paper on Attendance system by using face recognition. This project works on PCA Algorithm principal and update the attendance automatically without any human intervention.
- b) Priya Pasumarti, P,Purna Sekhar presented a paper on Classroom Attendance Using Face Detection And Raspberry. This project describes the method of detecting and recognizing the face in real time using Raspberry pi. This project describes an efficient algorithm using open cv. In this system is initially

trained with the student images and store these images in the data base, whenever student enters in front of camera it captures the image and compare with the data base images. If there is any match found it will update the attendance to the respective students.

- c) Mangesh Owandkar, AkshKolt, Devendra Peshave, Mrs Savita Jadhav presented a project on Attendance Monitoring System using Face Recognition. This paper describes a method for student's attendance system which will integrate with the face recognition technology using Principal component analysis algorithm. The attendance was marked based on the face recognition of the person. The segmented faces are compared with a predefined data base of all the students.

III. BLOCK DIAGRAM

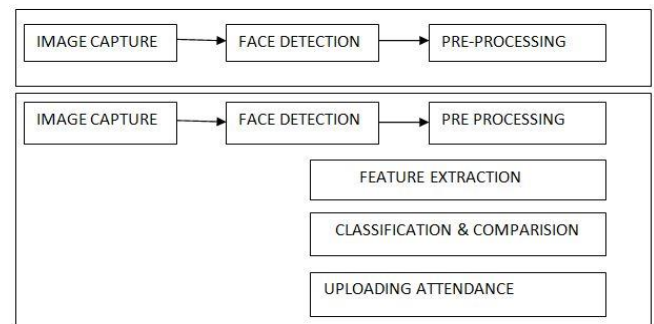


Figure 1: Block diagram for Proposed Approach

IV. HARDWARE COMPONENTS

A. Raspberry Pi 3 - The Raspberry Pi may be a low price, credit-card sized circuit that plugs into a laptop and uses keyboard and mouse. We can capable to write program in languages like Scratch and Python in Raspberry. This Raspberry pi equipped with ENC28J60 which is an Ethernet chip to get connected with internet. Raspberry can be used for many tasks that your computer does processing, spreadsheets and also to play HD video. The raspberry pi comes with a set of open source technology, i.e. communication and multimedia web technologies.



Figure 2: Raspberry Pi

B. Camera - A camera is associate instrument for recording or capturing pictures, which can be hold on regionally, transmitted to a different location, or both. The pictures is also individual still pictures or sequences of images constituting videos. The camera could be a remote sensing device because it senses subjects without any contact.



Figure 3: Camera

C. GSM module - The SIM card mounted GSM electronic equipment upon receiving digit command by SMS from any mobile phone send that information to the mega cycle through serial communication. While the program is dead, the GSM electronic equipment receives command 'STOP' to develop AN output at the mega cycle ,the contact purpose of that are not to disable the electric



Figure 4: GSM module

V. PROPOSED APPROACH

The total system is split into three modules- info creation, coaching the dataset, Testing, causation alert messages as associate degree extension. 1. Database creation a) Initialize the camera and set an alert message to grab the attention of the students. b) Camera captures the image c) Convert the image into gray scale, detect the face d) Store it in database by using PCA algorithm. 2. Training a) These gray scale images are converted into Eigen values b) Then these Eigen values or Eigen vectors were stored in the form of matrix c) Through this matrix we can find the feature vector length 3. Testing Load Haar classifier, LBPH face recognizer and trained data from xml file

Each feature is depicted as one worth obtained from the distinction of the totals of pixels in white parallelogram from the sum of all pixels within the black parallelogram. All completely different doable sizes and locations of classifier is employed for conniving of lots of options. As the number of classifiers increase the arithmetic computations seems to take a long time. To avoid this, we have a tendency to use the conception of Integral Image. In Image process Integral image may be a arrangement that is totaled space table and algorithmic program for quickly and

expeditiously generating sum of values in exceedingly rectangular grid set.

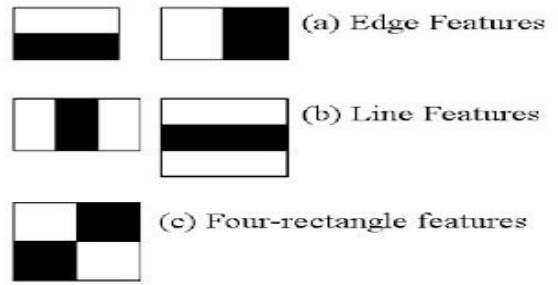


Figure 5: Haar Cascade

VI. FLOW CHART

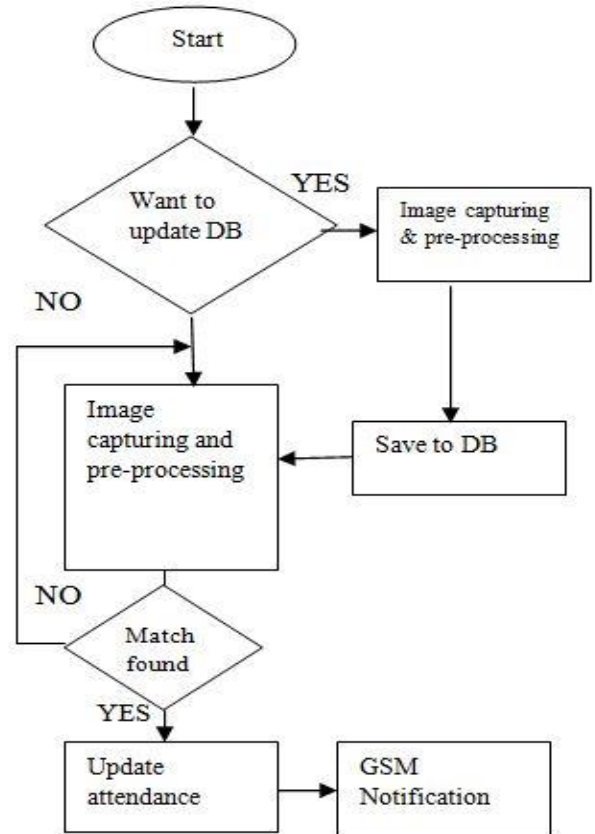


Figure 6: Flow chart

VII. IMPLEMENTATION

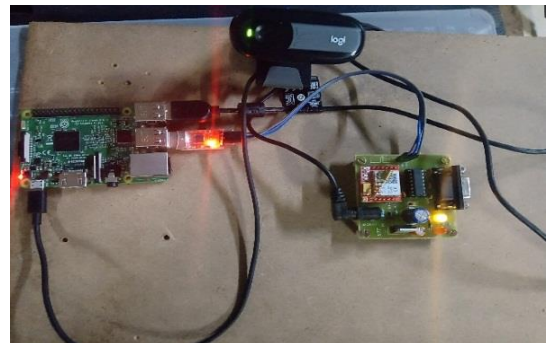


Figure 7: Implementation

VIII. RESULTS

This algorithm includes Haar feature selection process. All human faces share some similar properties. These regularities may be matched using HaarFeatures. A few properties common to human faces:

- The eye region is darker than the upper-cheeks.
- The nose bridge region is brighter than the eyes

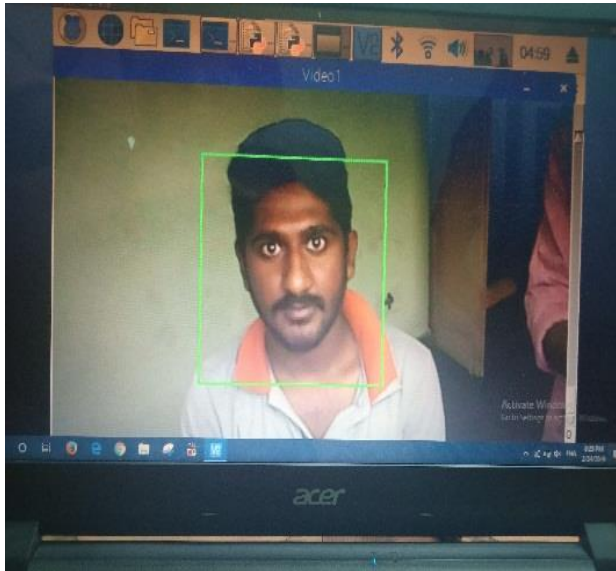


Figure 8: Face Identified

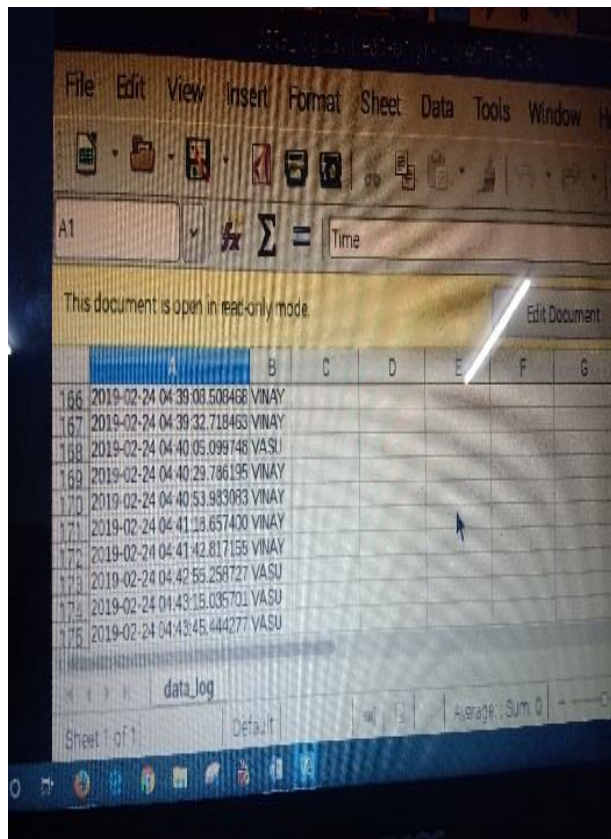


Figure 9: Excel sheet with student timings

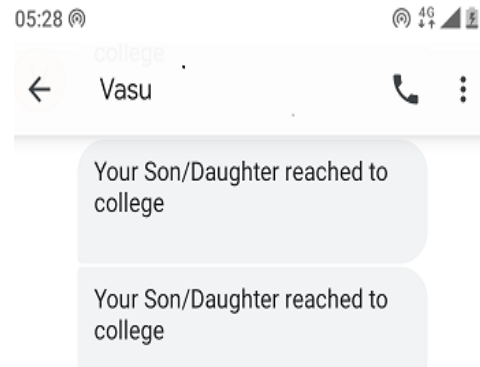


Figure 10: message alert to the parents

IX. CONCLUSION

We came to realize that there are extensive variety of methods, for example, biometric, RFID based and so on which are tedious and non-productive. So to defeat this above framework is the better and solid arrangement from each keen of time and security. Hence we have accomplished to build up a solid and productive participation framework to actualize an image handling algorithm to identify faces in classroom and to check the attendance.

X. SCOPE & FUTURE WORK

The same project can be utilized for several security applications where authentication is needed to access the privileges of the respective system. It can be used in recognizing guilty parties involving in unauthorized business. Face recognition algorithm can be improved with respect to the utilization of resources so that the project can recognize more number of faces at a time which can make the system far better. Many variants of the project can be developed and utilized for home security and personal or organizational benefits. We can also trace a particular student in an organization quickly with the help of this system.

XI. REFERENCES

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