

Smart Student Attendance System Using Face Detection

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ABSTRACT

Nowadays Educational institutions are concerned about regularity of student attendance. This is mainly due to students' overall academic performance is affected by his or her attendance in the institute. Mainly there are two conventional methods of marking attendance which are calling out the roll call or by taking student sign on paper. They both were more time consuming and difficult. Hence, there is a requirement of computer-based student attendance management system which will assist the faculty for maintaining attendance record automatically. The system is designed using MATLAB platform. The proposed system uses Principal Component Analysis (PCA) algorithm which is based on eigen face approach. This algorithm compares the test image and training image and determines students who are present and absent. The attendance record is maintained in an excel sheet which is updated automatically in the system.

Keyword: - Face Detection, Face Recognition.

1. INTRODUCTION

Face recognition technology have improved dramatically in their performance over the past few years, and this technology is now widely used for various purposes such as for security and for commercial applications. Face recognition is an active area of research which is a computer based digital technology. Use of face recognition for the purpose of attendance marking is a smart way of attendance management system. In this Project we are capturing image using Camera that we gives PC. Attendance is defined as the action or state of going regularly to or being present at a place or event.

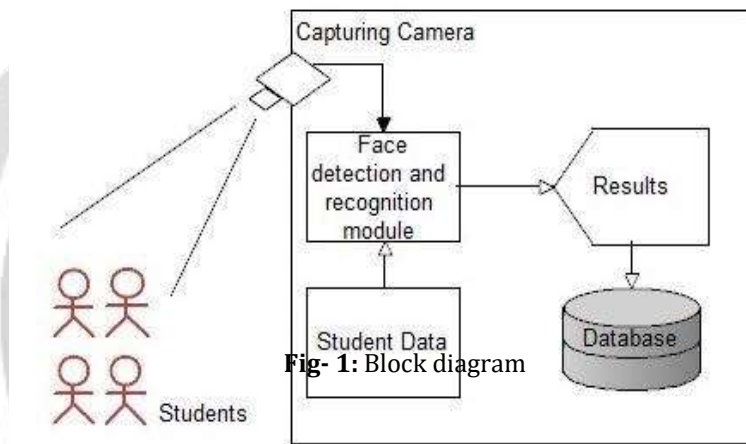
Attendance of every student is being maintained by schools and colleges. The manual attendance record system is inefficient and more time is required to record as well as calculate the attendance of each student. Hence a system is needed which will solve the issue of manual attendance. While the move towards the digital era is being accelerated every hour, biometrics technologies have started affecting people's daily life at each and every instance.

Processing of image data for storage, transmission and representation for autonomous machine perception. Also people have started to use image capturing devices never as before with the advent of smart phones and closed circuit television. Since the application of image processing is vast, extensive work and research have been carrying out in utilizing its potential to and to make new innovative applications. Facial recognition has been the earliest of the application derived from this technology, which is one of the most fool proof methods in human detection. Face is a typical multidimensional structure and needs good computational analysis for recognition. Biometrics methods have been used for the same purpose since a long time now. Although it is effective, it is still not completely reliable

for purpose of detecting a person.

1.1 PROPOSED SYSTEM

- We propose a system that by automating the process of attendance management that can be used during a lecture which will save effort and time.
- The system consists of a camera that captures the image of the classroom
- Sends it to the image processing module which then forwards it to the comparison module at the beginning of the session.
- In the processing module the image is enhanced to facilitate the matching process. After this face detection and recognition is performed.
- Database images& captured images are compared and the students who are present in both the sides are marked present in the excel sheet.
- In case a student is present whose face is not recognized, the lecturer can update the system manually.



2. WORKING

- As described in the proposed system, the unique Start capturing images through web camera.
- Pre-process the captured image and extract face image.
- Calculate the eigen value of the captured face image and compared with eigen values of existing faces in the database.
- If eigen value does not matched with existing ones, save the new face image information to the face database.
- If eigen value matched with existing one then recognition step will done & of the particular attendance will be generated
- Each students information will be linked to the database
All the attendance record of the days will be added to the individual record
- According to criteria of the college , list of defaulter students will be generated and e-mail will be sent to those students whose attendance is not up to the mark

The data flow diagram is as shown below.

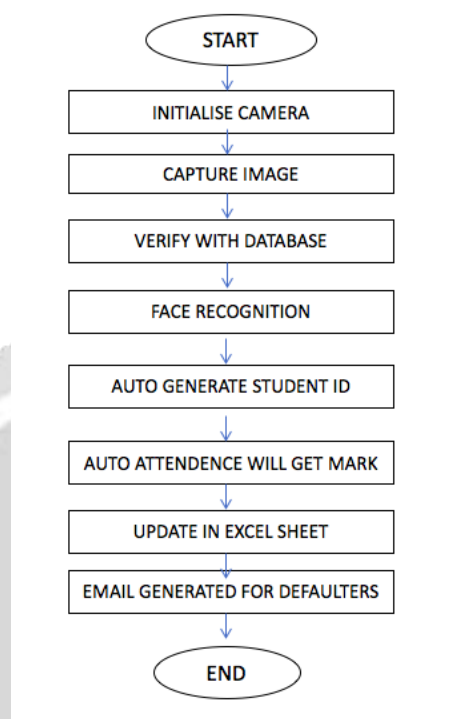


Fig -2: Data Flow Diagram

2.1 SYSTEM REQUIREMENTS

The hardware required in this system is used for capturing the images of students sitting in class for the lecture & usb to ttl for serial communication. The main execution algorithm will be run on the server PC which would be secured with a login ID and password of the authorized official.

Table -1: Hardware components

Component	Voltage Requirement	Description
Webcam	5 V	Camera to capture images
USB TO TTL	5 V	To send data between vb and matlab

2.2 Software Requirements

The main part of the system is a software based application. It uses Embedded C language for programming and has built in libraries for basic hardware components which are used extensively. The execution program is coded in Visual Basic and Matlab application in the backend. The screenshots of the frontend login and execution pages developed in the software are shown below.



The registration page features a 'Welcome' banner at the top. On the left, there is a graphic of two students with a green plus sign and the word 'Students' below it. To the right is a registration form with the following fields:

UID:	
Name:	
Department:	
Roll No.:	
Attendance:	
Percentage:	
Result:	
Behaviour:	

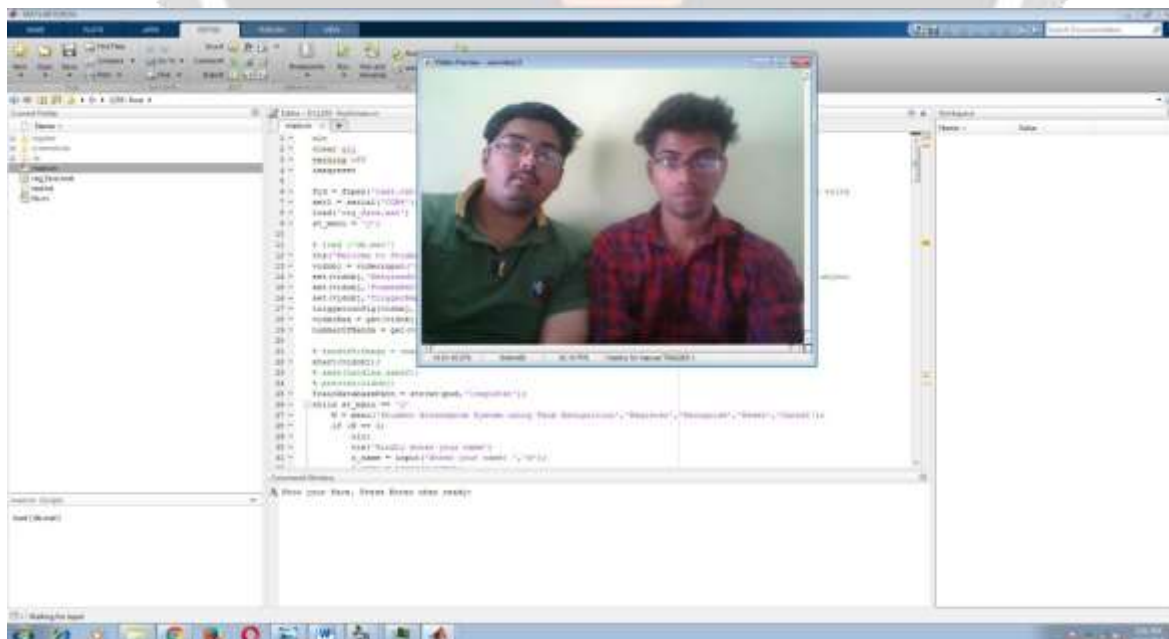
At the bottom, there are two buttons: 'Save' with a green checkmark icon and 'Clear' with a red X icon.

Fig -3: Registration Page

This page will be used to register first time the data of students when they are getting admitted to the college along with the image is captured from the camera which will be used further for marking the attendance of lecture.

The execution page is as shown below.

2.3 Execution



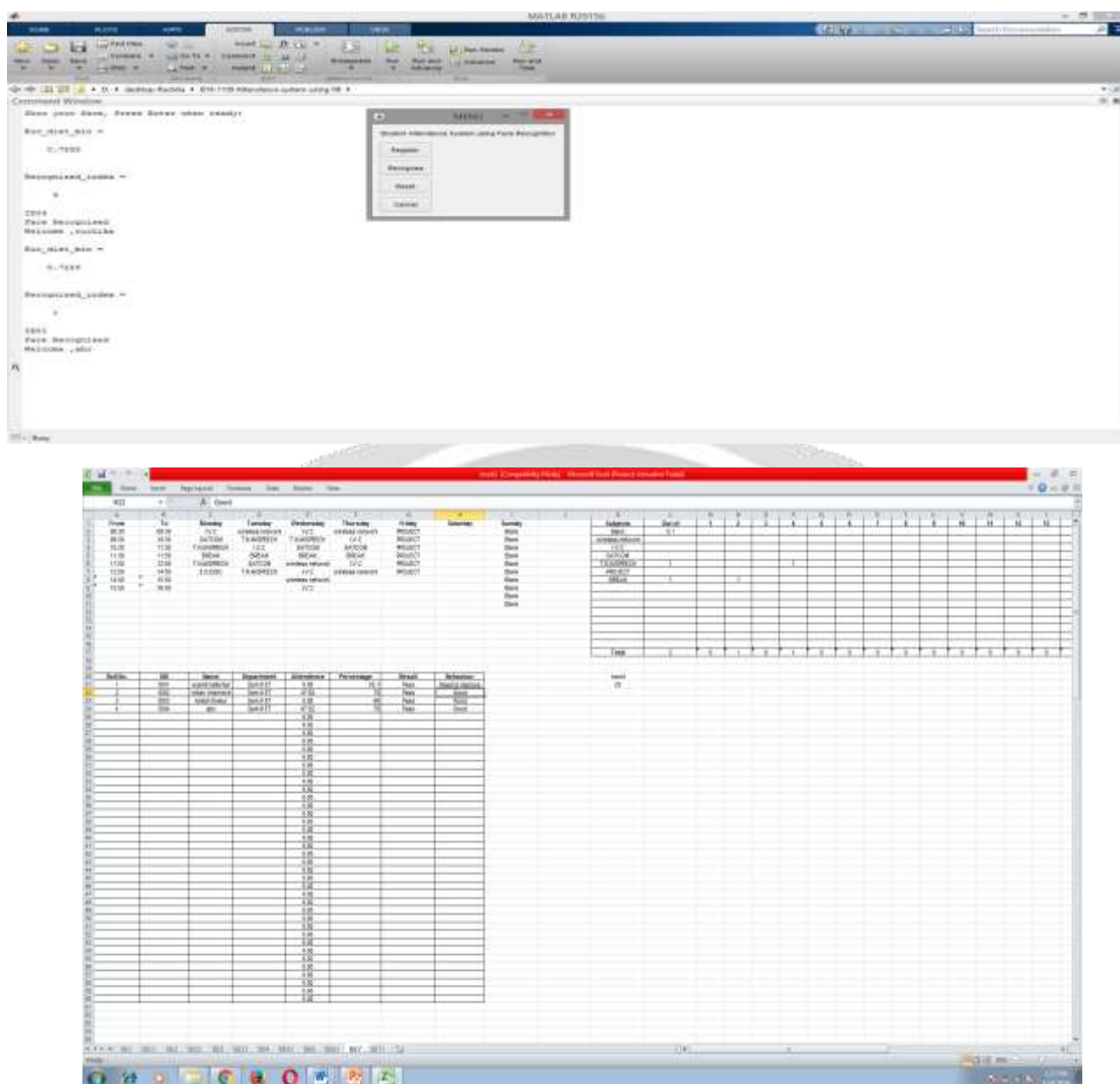


fig -4: Execution Page

After the successful execution of the program the attendance will be updated in the excel sheet according to the time table of the college. Only authorized persons of the college will have the access to the database of the students for any updating the things. The email will also be generated for the defaulter students.

3. ADVANTAGES AND APPLICATIONS

- **Maintains Overall Records:** An automated face recognition attendance system maintains the overall presence record of the students in the institution. Leaves taken by the students, date of absent each data is stored in the system.
- **Get Rid of Pen & Paper System:** The newest technology helps in replacing the older paper register.
- **Easy Integration:** Integrated Biometric facial systems are also easy to program into any computer system.

Usually they will work with existing software that one has in their place.

- **High Success Rate:** Facial biometrics technology today has a high success rate, especially with the emergence of 3d face recognition technologies. It is extremely difficult to fool the system, so one can feel secure about the system.
- **Proxy attendance is eliminated:** Attendance is taken automatically by the camera placed in the classroom therefore there will be no chances of proxy attendances.
- **Less Mistakes:** here will be chances of making mistakes while manually marking attendances by lecturers, while taking attendance automatically there will not be any chances of mistakes since the system is computer based.
- **Virtual Classroom:** Virtual classrooms are the class rooms without the lecturers to teach as students will be learning online. This system is very useful in virtual

4. CONCLUSIONS

This system is designed to minimize the human effort for taking the attendance manually that take place in every college. As the attendance marking process is done without any human interference, which is the main scope in the system, the aim is completed.

5. ACKNOWLEDGEMENT

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