Automated facial attendance logger for students

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Automated facial attendance logger for students

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Abstract From the past two decades, various spheres of activity are in the aspect of 'Face recognition' as an essential tool. The complete series of actions of face recognition is composed of 3 stages: Face Detection, Feature Extraction and Recognition. In this paper, we make an effort to put forth a new application of face recognition and detection in education. The proposed system scans the classroom and detects the face of the students in class and matches the scanned face with the templates that is available in the database and updates the attendance of the respective students.

1. Introduction

The crucial element of face detection is the ability to acknowledge the existence of the features of the human face and to work out a template and to store it in the database for later use. In the traditional approach, when the class attendance is taken, the student or the professor may not be audible and in that case the student may lose his attendance. Moreover, this old-fashioned way of attendance monitoring is exhausting and time consuming. To overcome this and to keep up with the advancements in technology, we put forth a new application of automatic face detection in classroom by which the professor need not worry the attendance criteria, rather dedicate their entire class to lecture.

2. Related Work

The complete series of face recognition consists of 3 stages: Face detection, Feature Extraction, Recognition.

2.1 Face detection:

[1] discusses various algorithms and methods used to detect individual faces in a group of people, the algorithms discussed in the [2] gives us a detail explanation as for which is the best algorithm, which is practically implemented till now, as per the survey which was conducted in [3], the Viola jones algorithm was the best algorithm which was implemented so far.

2.2 Features extraction:

[4] gives a brief survey of all the algorithms which were implemented for the feature extraction process. [5] provides a clear view as of which is the best algorithm which is practically implemented. As per [6] the color based technique for the extraction of facial features is considered to be one of most successfully method implemented so far.

2.3 Recognition:

[7] talks about the different techniques used for feature comparison between the new image and the existing image in the database available.[8] gives a detailed survey of the different methods used for the feature comparison and recognition. It also tells that template matching technique is the best technique for feature comparison implemented so far.

The present system of attendance monitoring in classrooms is primitive and traditional. In this method, the professors comes to the classroom with a attendance register or a laptop and calls out the register number of the students and the students respond to the call of the according to their turn. The disadvantage of this traditional method of attendance monitoring is that sometimes the student or the professor may not audible as a result the student ends of losing his/her attendance. The other disadvantage of this method is that the professor spends lot of his /her time in the class for monitoring the attendance.

3. Proposed System

In this paper, we propose a new system for attendance monitoring in classroom. The camera which will be installed in the class room takes a picture of the class after 15 min of arrival of the professor in the classroom.
The proposed system has 3 components:

1. Facial detection: As shown in fig (2) we scan the image of the picture which was taken in the classroom and each face is detected, cropped and counted. The image will be in .png format. Each cropped image is saved as a new file in the database. The image is now ready to be extracted for the features.
2. Feature extraction: The unique features of each face is extracted based on the image,
    - Eyes: It is one of the feature which is extracted for people who are not using glasses as shown in fig (3).
    - Nose: It is the feature which is extracted for people whose eyes feature does not give a unique feature as shown in fig (4).
    - Mouth: It is the feature which is extracted for the student who wears glasses.
3. Recognition: In this method, we compare the existing template with the cropped images which we got in the first step. Compare the features which were taken from the new cropped images using eigen core method and compare them with the template database which is already trained in the pre-requisite state as shown in fig (6).

Pre-requisite implementation steps:

1. Each student must be called individually and the face must be scanned and the facial features must be recorded in an orderly form as shown in fig (5).
2. From the extracted features of individual students. A unique template must be created and saved in the database with a unique id which can be extracted at the time of need.

3. The template must be trained with the eigen core matrix method and the set of templates must be saved with unique name in series.

3.1Overview of the Proposed system

The overview of the system shows how the facial feature is extracted compared and recognized. The below figure (1) shows the overview of proposed system.

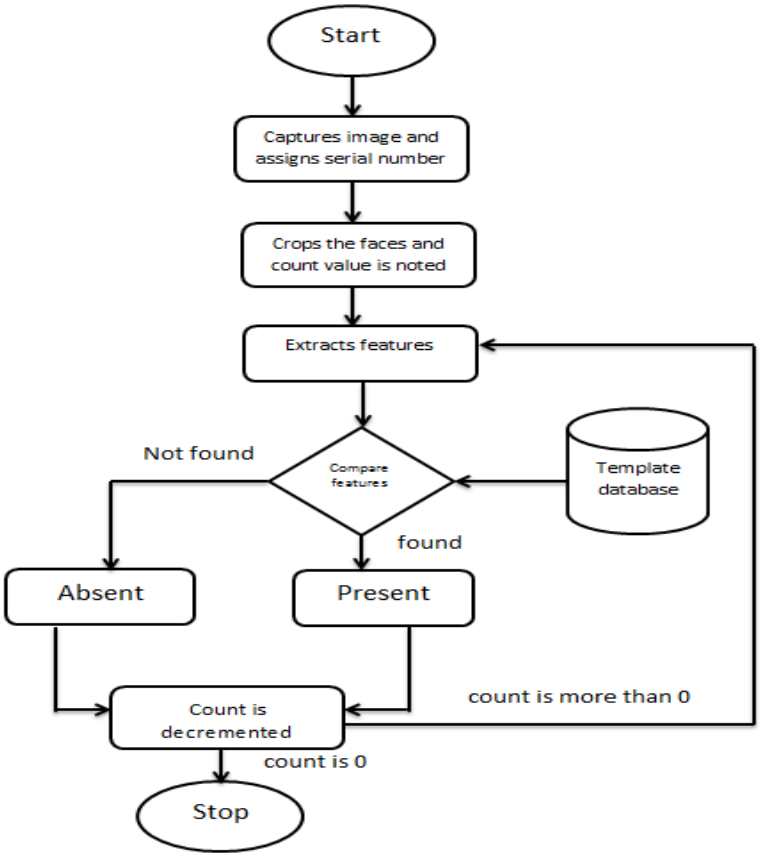

Fig. 1Overview of the Proposed System

4. Results and Discussion

The proposed method has been implemented using MAT Lab 2013a.The below figure2 shows how the face is detected and the other figure 3 and 4 depicts how the features of the face are extracted.

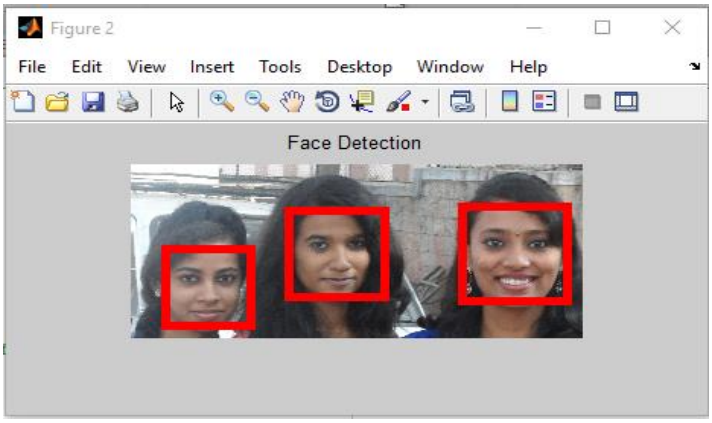

Fig. 2 Detecting individual faces in group

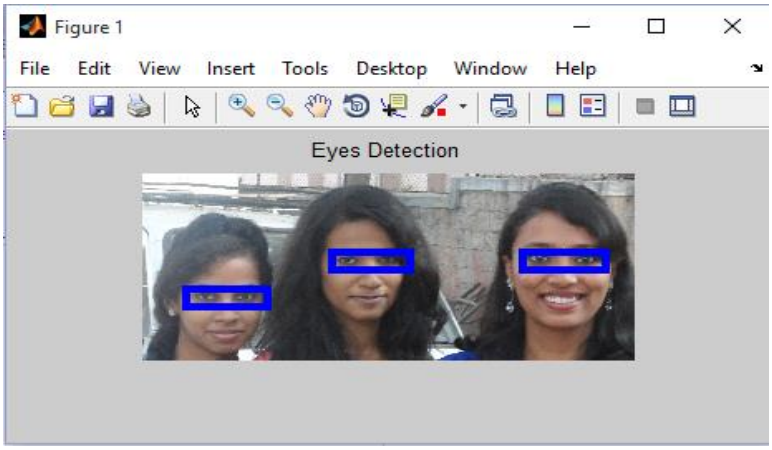

Figure 3. Extracting the first feature (i.e.) the eye

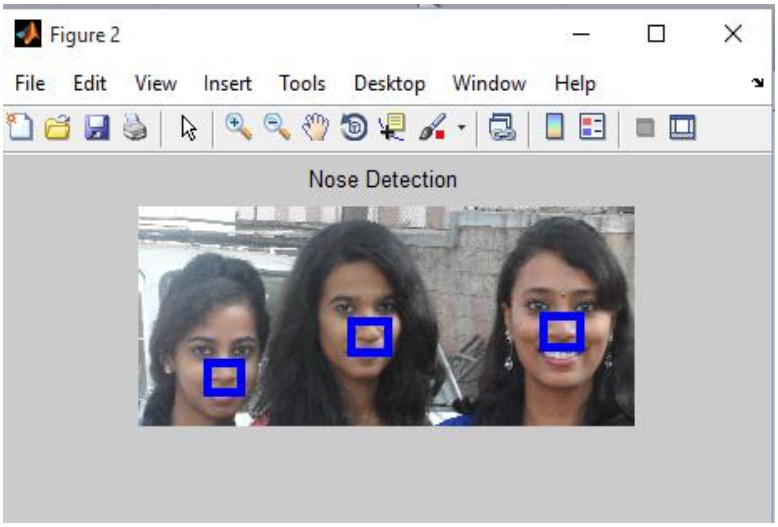

Figure 4.Extracting the second feature (i.e.) nose

5. Conclusion

This paper is proposed considering the problems faced by the professor in classroom for monitoring the attendance. In this paper we have successfully implemented the two main components of facial recognition (i.e.) the face detection in a group and extracting the facial features of individual students in a group image.

6. Future Work

The third component (i.e.) the recognition of faces are compared the cropped image with the template which is found in the database. By implementing this we can achieve the automated attendance monitoring in classrooms. After this by implementing automatic behaviour monitoring in classroom which will keep track of each student of his activities and shows the professor if any kind of malpractice is performed in the class room with the concept of video monitoring. We can achieve our goal by complete automated classroom in which the professor dedicates his/her class for lecture.

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