FACE DETECTION AND RECOGNITION FOR AUTOMATIC ATTENDANCE SYSTEM

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Abstract— In this paper, we propose a framework that takes the participation of students for classroom lecture. The proposed system framework takes the participation naturally utilizing face identification and recognition. This participation is recorded by utilizing a camera connected as a part of front of classroom that is continuously catching pictures of students, detect the faces in image and contrast the distinguished appearances and the database and mark the attendance. This paper first audit the related works in the field of participation administration and face acknowledgment. At that point, it presents our framework structure and plan. Finally, experiments are implemented and it shows the improvement of the performance of the attendance framework.
Index Terms— Automated Attendance, Camera, EmguCV, Face Detection, Face Recognition, Modules of proposed system, Viola-Jones Algorithm

I. INTRODUCTION

Maintaining the attendance is essential in every one of the foundations for checking the performance of students. Each organization has its own technique. Traditionally student's attendance is taken physically by utilizing participation sheet, given by the employee in class. The Current participation stamping techniques are repetitive and tedious. Physically recorded participation can be effortlessly controlled. Besides, it is exceptionally hard to confirm one by one student in a substantial classroom environment with disseminated branches whether the verified students are really reacting or not.
 Consequently this paper is proposed to handle every one of these issues. Framework is such that it uses face detection and recognition algorithms which automatically detect and registers student attending on a lecture. Face detection and recognition is often referred to as, analyses characteristics of a person's face image input through a camera. It measures overall facial structure, distances between eyes, nose and mouth. Hence, this system handles all the issues which occurred in traditional system.

**II.**   WORKING OF THE PROPOSED SYSTEM

The proposed attendance system mainly consists of Four phases; Image acquisition, Face Detection, Feature Extraction, Face Recognition. The working of the system is depicted as follows:

A. Image Acquisition: The system consists of a camera   that captures the images of the classroom and sends it to the image pre-processing. Then that image is sends for face detection.
B. Face Detection: This process separates the facial area from the rest of the background image. The faces which are stored in the database.
C. Feature Extraction: Feature extraction is done for distinguishing faces of different student.In this system,eyes, nose and mouth are extracted.Feature extraction is helpful in face detection and recognition.
D. Face Recognition: The face image is then compared with the stored image.If the face image is matched with the stored image then the face is recognized.Then for that particular student the attendance is recorded.

Screenshot of Proposed System:
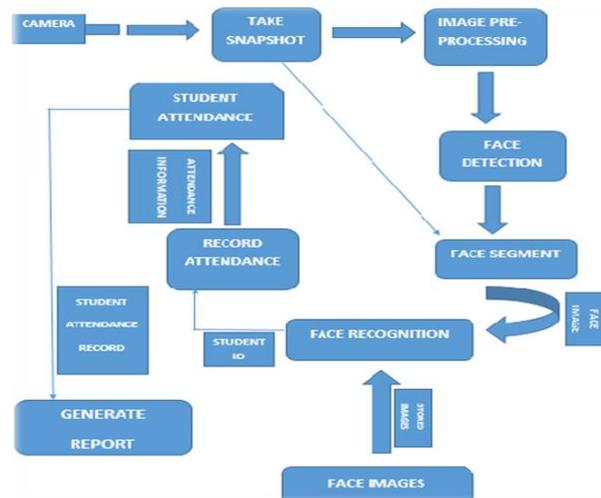
III.   MODULES OF PROPOSED SYSTEM
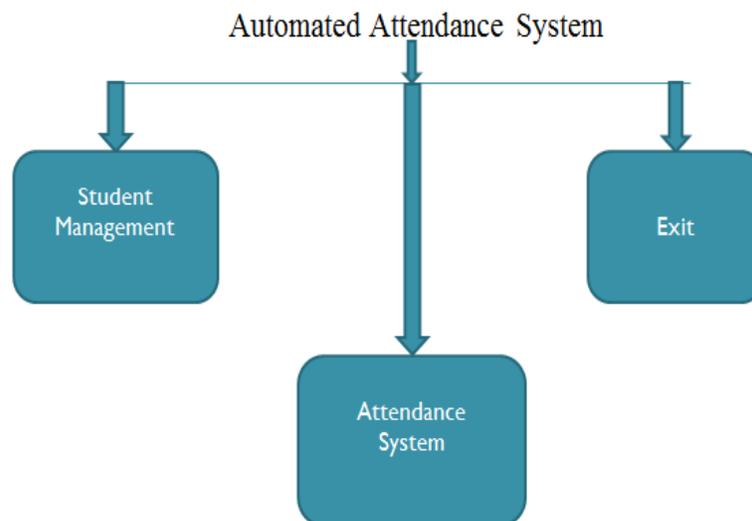
A. Student Management: This constitutes the first phase of our project module. This section consists following parameters:

   1. Student Registration Form: The student appears as a new candidate for registration. Registration consists of adding each candidate's personal details.
   2. Student Face detection: The newly registered candidate's face gets detected for the very first time and stored in the database.

B. Attendance System: This constitutes the second phase of our project module. The recognition of each individual student takes place by extracting the common features of each individual by using image integral method. Then the face image is matched with the image stored in the database (MS SQL) and the attendance is marked for the candidate only if the facial feature of the newly captured image matches with the already stored image.

C. Exit: It takes the control out of the module.

Screenshot of modules of proposed system:

IV. ALGORITHM FOR FACE DETECTION AND RECOGNITION

1) In this system, we utilize Haar cascade classifier which is generally based on feature abstraction, i.e., we use Viola-Jones Detector.

2) Object Detection utilizing Haar feature-based classifiers is an effective object detection strategy proposed by Paul Viola and Michael Jones in their paper, "Rapid Object Detection uses a Boosted Cascade of Simple Features" in 2001.

3) It is a machine learning based methodology where a cascade function is prepared from a great deal of positive and negative pictures. It is then used to identify objects in different pictures.

4) Steps of Viola-Jones Detector:

   • Calculating the integral image- summed area table necessary for quick calculation.
   • Haar-like Features- simple rectangular features that achieve just above random.
   • AdaBoost learning algorithm- creates a small set of only the best features to create more efficient classifiers.
   • Cascade Filter- discards negative windows early to focus more computational time on possible positive windows.

V. SCREENSHOT OF PROPOSED SYSTEM
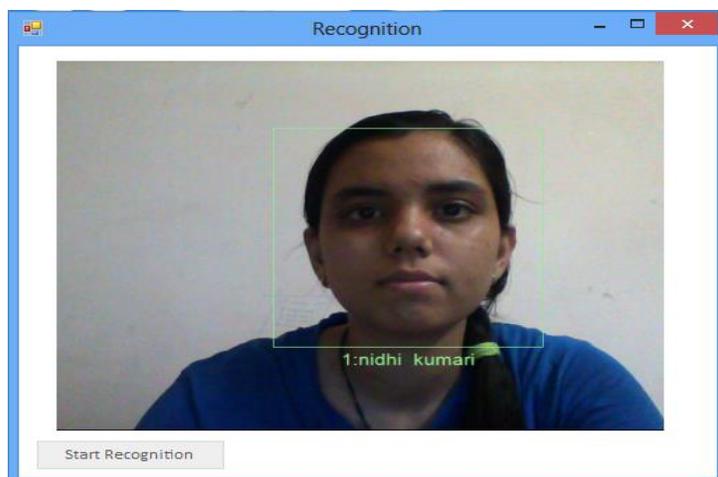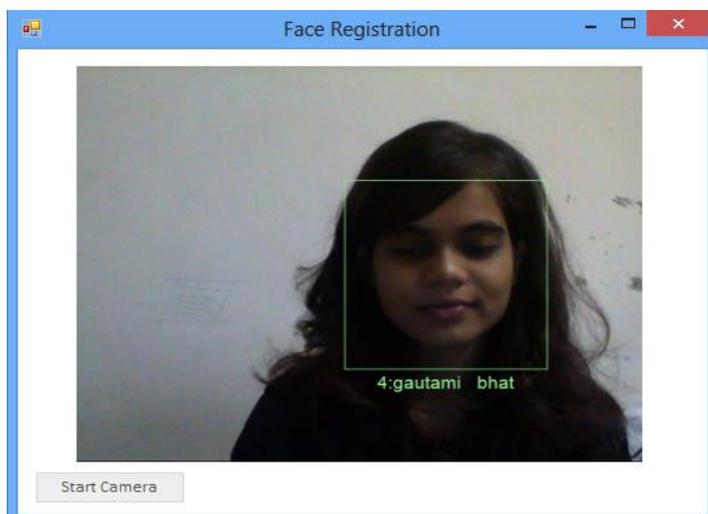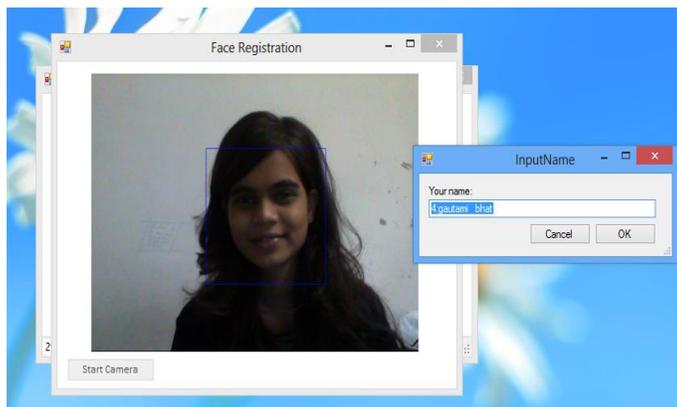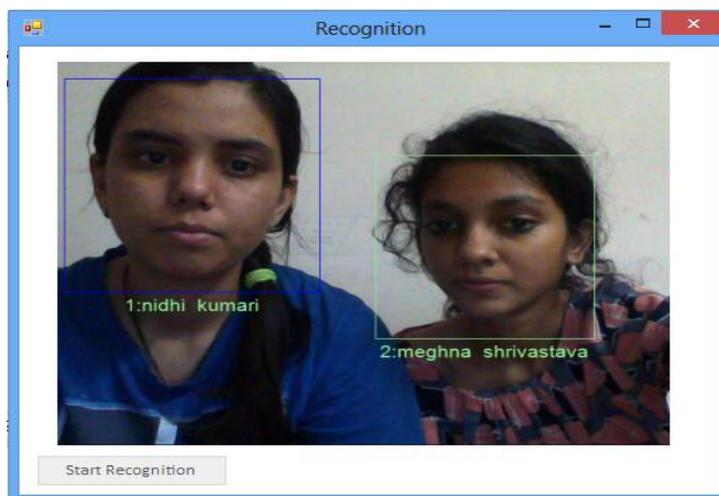
VI.   CONCLUSION AND FUTURE SCOPE

We come to realize that there are extensive variety of strategies, for example, biometric, RFID based and so forth which are time consuming and non-efficient. So to overcome, this above framework is the better and reliable solution from every perceptive of time and security. In this way we have accomplished to add to a reliable and effective participation framework to distinguish faces in classroom and recognize the faces accurately to mark the attendance.

The scope of the project is the system on which the software is installed, i.e. the project is developed as a desktop application, and it will work for a particular institute. But later on the project can be modified to operate it online.

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