

# **Face Recognition Attendance System**

**A Minor Project Diagrams Submitted to**



**Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal**

**Towards Partial Fulfillment for the Award of**

**Bachelor of Engineering**

**(Information Technology)**

**Under the Supervision of**

**Prof. Narendra Pal Singh**

**Submitted By**

**Naman Jain (0827IT151068)**

**Nitin Baghel (0827IT151076)**

**Pranjal Soni (0827IT151082)**

**RoshanMahajan(0827IT15090)**

**Sachin G Patidar (0827IT151093)**



**Department of Information Technology**

**Acropolis Institute of Technology & Research, Indore**

**Abstract:**

Automatic face recognition (AFR) technologies have seen dramatic improvements in performance over the past years and such systems are now widely used for security and commercial applications. An automated system for human face recognition in a real time background for a college to mark the attendance of their students. So Smart Attendance using Real Time Face Recognition is a real world solution which comes with day to day activities of handling students. The task is very difficult as the real time background subtraction in an image is still a challenge. To detect real time human face are used and a simple fast Principal Component Analysis has used to recognize the faces detected with a high accuracy rate. The matched face is used to mark attendance of the student. Our system maintains the attendance records of students automatically. Manual entering of attendance in logbooks becomes a difficult task and it also wastes the time. So we designed an efficient module that comprises of face recognition to manage the attendance records of students. Our module enrolls the face. This enrolling is a onetime process and their face will be stored in the database. During enrolling of face we require a system since it is a onetime process. You can have your own roll number as your student id which will be unique for each student. The presence of each student will be updated in a database. The results showed improved performance over manual attendance management system. Attendance is marked after student identification. This will give much more solutions with accurate results in user interactive manner rather than existing attendance and leave management system.

**Problem Statement:**

Maintaining the attendance is very important in all the institutes for checking the performance of student. Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait for long time in making a queue at time they enter. Many biometric systems are available but the key authentications are same is all the techniques. Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrollment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system uses the face recognition approach for the automatic attendance of students in the office room environment without student's intervention. Face recognition consists of two steps:

1. Face Detection Where the input image is searched to find any face and detected in the image.
2. Face Recognition- These detected faces are compared with the database for verification.

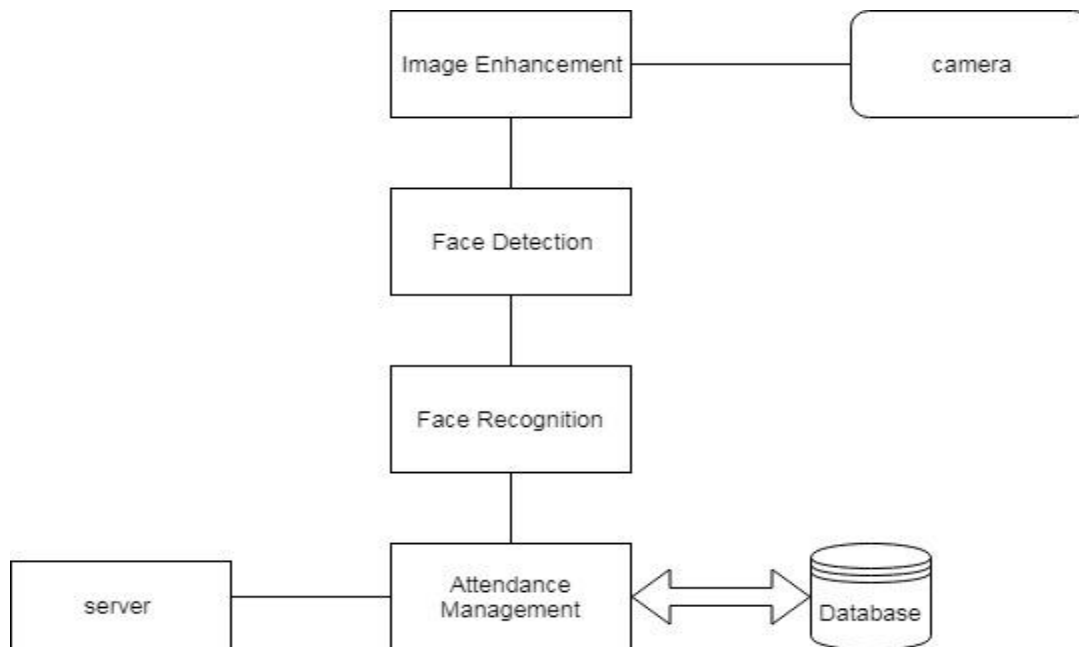
**Background:**

A number of methods have been proposed for face detection i.e. Ada Boost algorithm, the Float Boost algorithm, the S-Ada Boost algorithm Support Vector Machines (SVM), and the Bayes classifier. The efficiency of face recognition

algorithm can be increased with the fast face detection algorithm. In all the above methods opencv, tensor flow, keras is most efficient. Our system utilized this algorithm for the detection of faces in the office room image. Face recognition techniques can be Divided into two types Appearance based which use texture features that is applied to whole face or some specific features. Face recognition technology analyses the face image to extract the facial feature, and then identify specific target. The development of deep learning technology further improves the accuracy of face recognition. Deep Learning CNNs (Convolutional Neural Networks) have made significant breakthrough.

### **Methodology:**

The system consists of a camera that captures the images of the student and sends it to the image enhancement module. After enhancement the image comes in the Face Detection and Recognition modules and then the attendance is marked on the database server. This is shown in the experimental below. At the time of enrolment, templates of face images of individual students are stored in the Face database. Here all the faces are detected from the input image and the algorithm compares them one by one with the face database. The face is recognized the attendance is marked on the server from where anyone can access and use it for different purposes.



In this way a lot of time is saved and this is highly secure process no one can mark the attendance of other. Attendance is maintained on the server so anyone can access it for purposes like administration. In order to avoid the false detection we are using the skin classification technique. Using this technique enhance the efficiency and accuracy of the detection process. In this process first the skin is classified and then only skin pixels remain and all other pixels in the image are set to black, this greatly enhance the accuracy of face detection process. Two databases are displayed in the experimental setup. Face Database is the collection of face images and extracted features at the time of enrolment process and the second attendance database contains the information about the student and also uses to mark attendance.

**Evaluation Measures:**

The ORL Database of Faces contains ten different images of each of 40 distinct subjects (400 different images). Measures such as accuracy and Mean Average Precision (MAP) will be computed for the face recognition. Following are the three ways that can be used to estimate the performance of face recognition based attendance system based on deep learning models in Python using the Keras library:

1. Use Automatic Verification Datasets.
2. Use Manual Verification Datasets.
3. Use Manual k-Fold Cross Validation.

**Software and Hardware Requirements:**

Python based Computer Vision and Deep Learning libraries will be exploited for the development and experimentation of the project. Tools such as Anaconda Python and libraries such as Open CV, Tensor flow, and Keras will be utilized for this process. Training will be conducted on NVIDIA GPUs for training the end-to-end version of CNN based object detection model.

**References:**

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