A Conceptual Model for Automated Attendance Marking System Using Facial Recognition

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Abstract

Uniqueness or individuality of an individual is his face. In this project face of an individual is used for the purpose of attendance making automatically. Maintaining attendance is very important in all learning institutes for checking the performance of students. In most learning institutions, student attendances are manually taken by the use of attendance sheets issued by the department heads as part of regulation. The students sign in these sheets which are then filled or manually logged in to a computer for future analysis. Assume that the duration for one subject is around 60 minutes or 1 hour & to record attendance takes 5 to 10 minutes. For every tutor this is consumption of time. This method is tedious, time consuming and inaccurate as some students often sign for their absent colleagues. This method also makes it difficult to track the attendance of individual students in a large classroom environment.

This Paper is an attempt for smart attendance using real time facial recognition. Multiple user faces are detected and recognized with the database trained with multiple texture based features.

1. INTRODUCTION

Maintaining attendance is very important in all learning institutes for checking the performance of students. In most learning institutions, student attendances are manually taken by the use of attendance sheets issued by the department heads as part of regulation. The students sign in these sheets which are then filled or manually logged in to a computer for future analysis. This method is tedious, time consuming and inaccurate as some students often sign for their absent colleagues. This method also makes it difficult to track the attendance of individual students in a large classroom environment. In this paper, we propose the design and use of a face detection and recognition system to automatically detect students attending a lecture in a classroom and mark their attendance by recognizing their faces.

While other biometric methods of identification (such as iris scans or fingerprints) can be more accurate, students usually have to queue for long at the time they enter the classroom. Face recognition is chosen owing to its non-intrusive nature and familiarity as people primarily recognize other people based on their facial features. The facial biometric system will consist of an enrollment process in which the unique features of a persons' face will be stored in a database and then the processes of identification and verification. In these, the detected face in an image (obtained from the camera) will be compared with the previously stored faces captured at the time of enrollment.

2. EXISTING SYSTEMS

Fingerprint Based Automation

In the Fingerprint based existing attendance system, a portable fingerprint device need to be configured with the students fingerprint earlier. Later either during the

lecture hours or before, the student needs to record the fingerprint on the configured device to ensure their attendance for the day. The problem with this approach is that during the lecture time it may distract the attention of the students.

Iris Based Recognition

In the Iris based student attendance system, the student needs to stand in front of a camera, so that the camera will scan the Iris of the student. The scanned iris is matched with data of student stored in the database and the attendance on their presence needs be updated. This reduces the paper and pen workload of the faculty member of the institute. This also reduces the chances of proxies in the class, and helps in maintaining the student records safe. It is a wireless biometric technique that solves the problem of spurious attendance and the trouble of laying the corresponding network.

3. PROPOSED SYSTEM

In the proposed system of Conceptual Model for Automated Attendance Marking System Using Facial Recognition, uses the basic idea of image processing through class room automation with multi face feature comparison and recognition system by using LBP feature extraction. The proposed solution is used in many security applications like banks, airports, Intelligence agencies etc.

4. SYSTEM IMPLEMENTATION

The proposed system has been implemented based on 3 basic steps.

1. Image Capturing
2. Face Detection and
3. Face Recognition

Image Processing

In Image Processing, the face of the student is captured using the web camera of the system. The name of the student must be provided manually before capturing the face of the student.

Face Detection

Face detection is the process of identifying and locating all the present faces in a single image or video regardless of their position, scale, orientation, age and expression. A face Detector has to tell whether an image of arbitrary size contains a human face and if so, where it is. Face detection can be performed based on several cues: skin color (for faces in color images and videos, motion (for faces in videos), facial/head shape, facial appearance or a combination of these parameters.

Face detection is posed as classifying the pattern in the sub window either as a face or a non-face. The face/non- face classifier is learned from face and non-face training examples using statistical learning methods. The proposed system uses the Viola Jones object detection framework, which is based on Haar Cascades for face detection.

Face Recognition

Face Recognition is a visual pattern recognition problem, where the face, represented as a three dimensional object that is subject to varying illumination, pose and other factors, needs to be identified based on acquired images. Face Recognition is therefore simply the task of identifying an already detected face as a known or unknown face and in more advanced cases telling exactly whose face it is.

In this system Principal Component Analysis (PCA) eigen face algorithm is used for face recognition. In this algorithm a training set of ‘m’ images of same size are provided. Eigen face values are calculated for captured image and then compared with the existing images present in the database. If the individual face of student is recognized then automatically updates the excel sheet which makes the completion of attendance for the individual students.

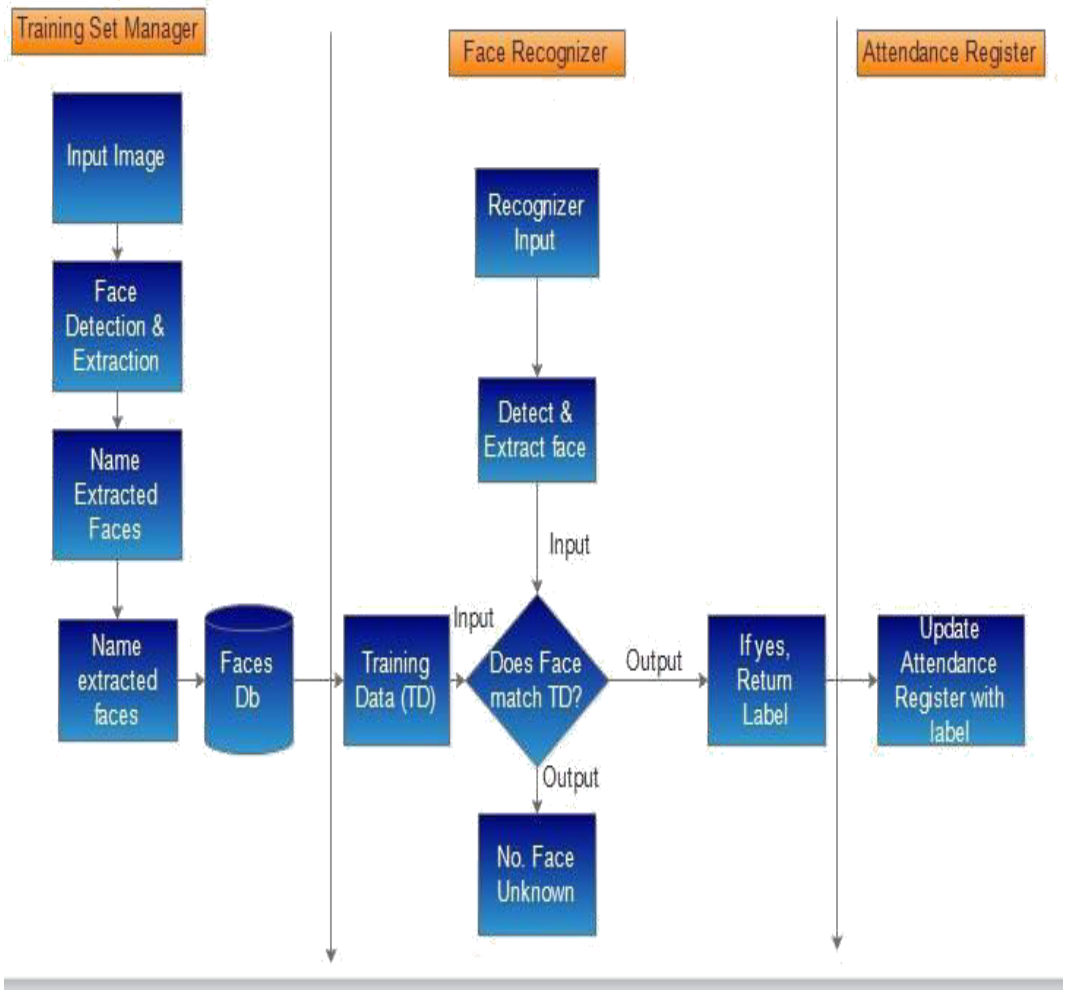

Fig 1: Flow Chart of the Attendance System

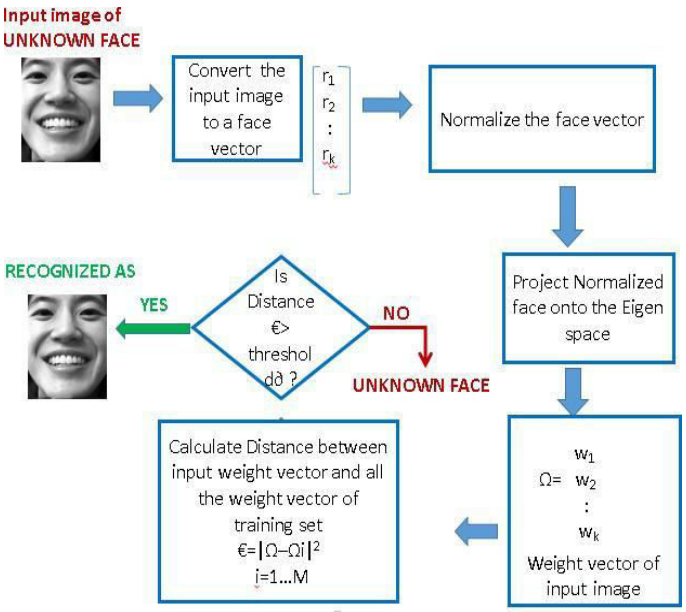

Fig 2: Face Detection and Recognition of Student

5. CONCLUSION

In this paper, a reliable, secure, fast and an efficient class attendance management system has been developed replacing a manual and unreliable system. This face detection and recognition system will save time, reduce the amount of work done by the administration and replace the stationery material currently in use with already existent electronic equipment.

There is no need for specialized hardware for installing the system as it only uses a computer and a camera. The camera plays a crucial role in the working of the system, hence the image quality and performance of the camera in real time scenario must be tested especially if the system is operated from a live camera feed.

6. REFERENCES

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