FACE RECOGNITION BASED ATTENDANCE SYSTEM

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ABSTRACT:

The most arduous task in any organization is attendance marking and to avoid any proxy attendance. In this project we proposed an automated attendance management system which tackles the predicament of recognition of faces in biometric systems subject to different real time scenarios such as illumination, rotation and scaling. This model incorporates a camera that captures input image, an algorithm to detect a face using the input image and recognize the face and mark the attendance in the database and also convert it into an excel Sheet file. The camera captures the image and is used to train the algorithm which in turn is used to recognize the face at the time of marking the attendance. We used Haar Cascade Classifier(OpenCV). One of the most popular and successful "person detectors" out there is the Harr Cascade Classifier(OpenCV) with LBPH (a type of machine learning algorithm for classification) approach.

Keywords: Face Recognition, Face Detection, Machine Learning, LBPH

INTRODUCTION:

Checking the presence of students and maintaining the attendance is a tedious process for an institute. Each institute has endorsed their own method of taking attendance i.e. calling the names or by passing the sheets. Several popular automatic attendance systems currently in use are RFID, IRIS, FINGERPRINT etc.

However, if there is any damage to the RFID card, it may result in an improper attendance. Apart from this deploying these systems on a large scale is not cost efficient and also takes a lot of time to post attendance.

The human face is a unique representation of individual identity. Thus, face recognition is defined as a biometric method in which identification of an individual is performed by comparing real-time captured image with stored images in the database of that person. Face recognition system is prevalent due to its simplicity and awesome performance.

In this system we use an image to record the attendance in lectures or sections and keeping the database of attendance which provides an automated attendance system.

METHODOLOGY:

The approach performs face recognition based student attendance system. The methodology flow begins with the capture of image by using simple and handy interface, followed by pre-processing of the captured facial images, then feature extraction from the facial images, subjective selection and lastly classification of the facial images to be recognized and then updating their attendance in database and an excel sheet.

There are many efficient face recognition algorithms present like EigenFaces, Fisherfaces, Feature Invariant methods, Machine Learning based algorithms. Out of these methods we will be using Viola and Jones framework due to three main reasons.

1. The first is the image representation called the "Integral Image" which allows the features used by our detector to be computed very quickly.
2. The second is a learning algorithm, based on AdaBoost, which selects a small number of critical visual features from a larger set and yields extremely efficient classifiers.

3. The third is a method for combining increasingly more complex classifiers in a "cascade" which allows background regions of the image to be quickly discarded while spending more computation on promising object-like regions.

Face region is then extracted and as unwanted noise and uneven lighting exists in the images therefore several pre-processing steps are necessary. Pre-processing steps that would be carried out include scaling of image, median filtering, conversion of color images to grayscale images and adaptive histogram equalization. Histogram equalization method usually increases the global contrast of images, especially when the usable data of the image is represented by close contrast values. Through this adjustment, the intensities can be better distributed on the histogram. This allows for areas of lower local contrast to gain a higher contrast.

In face recognition based system every individual is required to enroll i.e. we have to take the images of individuals in different angles and expressions and hence create a training dataset which is used by LBPH classifier to recognize individuals. For this we might need an ID (it may be a number or the name of the person or both in this case)

for each image, so the algorithm will use this information to recognize an input image and mark the attendance appropriately.

The flow chart for the proposed system is categorized into two parts, first training of images followed by testing images (recognize the unknown input image) shown in figures 1 and 2:
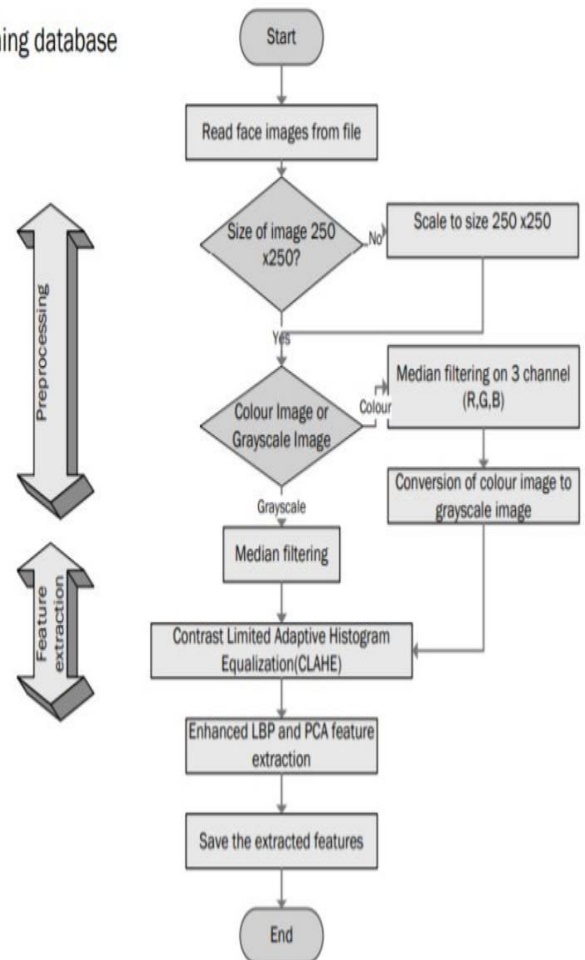

Fig 1. Training Database

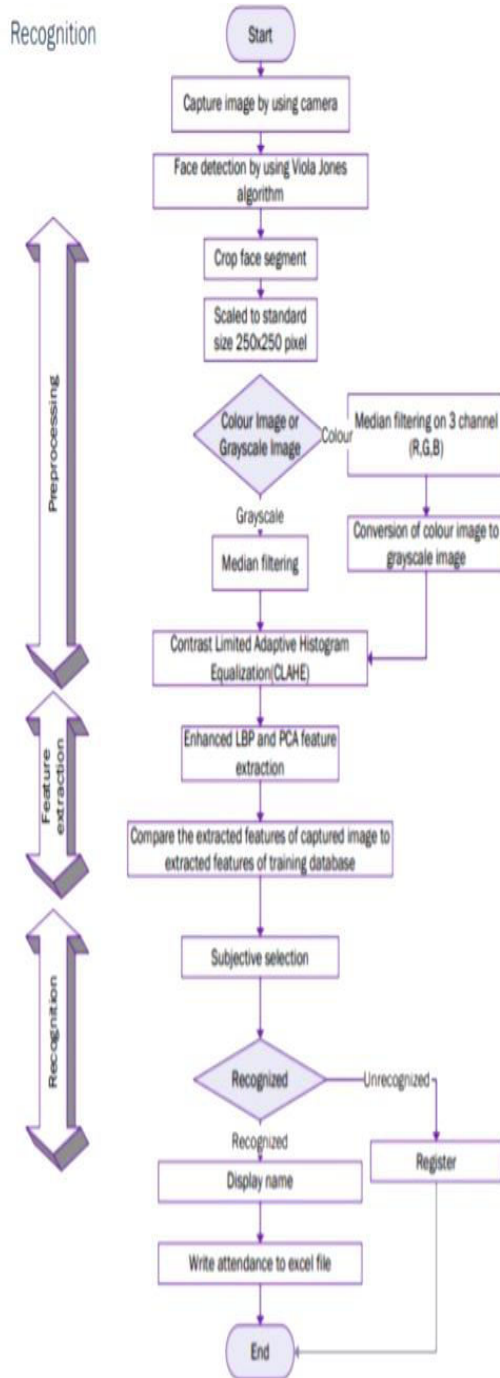**Fig 2. Recognition Flow Chart**

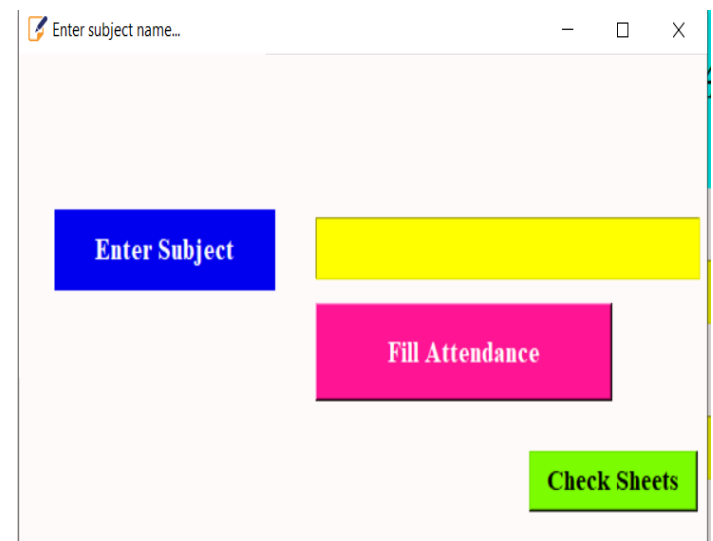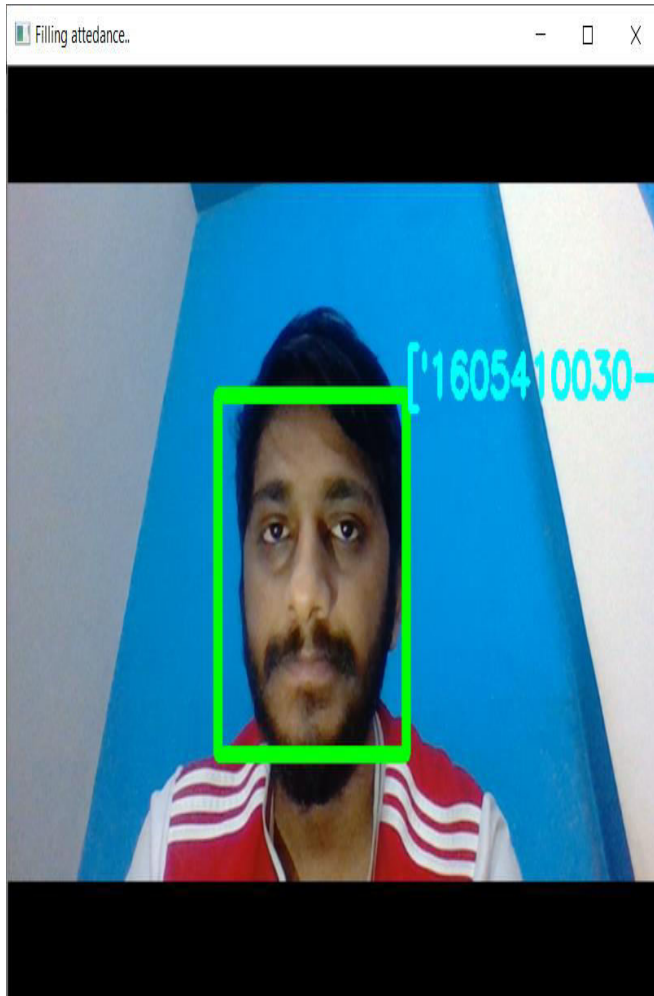**SYSTEM SNAPSHOTS:**

Fig 3. Home screen of the Project

Fig 4. Marking Attendance

Fig 5. Recognising the Face

CONCLUSION:

Face Based Attendance Management System using Machine Learning thus proved to be time saving and cost effective. In real time scenarios LBPH outperforms other algorithms with better recognition rate and low false positive rate.

The future work is to improve the recognition rate of algorithms and the enrichment approach of camera formation based on the result of the position valuation in order to progress the face detection effectiveness.

ACKNOWLEDGEMENT

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