# FACE RECOGNITION ATTENTENCE SYSTEM

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## ABSTRACT

A face recognition attendance system is a type of biometric attendance system that uses facial recognition technology to authenticate the identity of individuals in a given location. This system provides a more accurate and reliable way to record attendance as compared to traditional methods like manual attendance registers or card-based attendance systems. The system captures an individual's face image and compares it with the database of enrolled faces to determine the person's identity. The face recognition attendance system comprises a camera, an image processing unit, and a database for storing the face templates of all employees. The main advantage of the face recognition attendance system is that it is contactless and does not require employees to touch any devices or punch cards, thereby minimizing the spread of contagious diseases. It is also faster and more accurate than traditional attendance systems, as it eliminates the possibility of buddy punching or proxy attendance

## Keywords:-

Face Recognition; Face Detection; Haar-Cascade; Viola-Jones; Histogram of Oriented Gradients ;Deep Conversional Neural Network ; attendance system;

## INTRODUCTION

As a result, many institutions began using a variety of other methods to track attendance, including Radio Frequency Identification (RFID) [3], iris recognition [4], fingerprint recognition, and others. These technologies, however, operate on a queue, which could take longer and be more obtrusive. A face recognition attendance system is a computerized method of tracking attendance by using facial recognition technology. This system uses a camera to capture images of individuals, and then analyses the images to identify and verify the individual's identity. The system works by comparing the captured image to a database of images to find a match. Once a match is found, the system can then mark the attendance of the individual. This type of attendance system is becoming increasingly popular as it provides a more secure and efficient way to manage attendance records. One of the benefits of a face recognition attendance system is that it eliminates the need for physical contact with devices, such as fingerprint scanners, which can be unsanitary, especially during a pandemic. Additionally, it can reduce the likelihood of errors that may occur with manual attendance tracking. Overall, a face recognition attendance system is a sophisticated technology that has the potential to revolutionize attendance tracking in various settings, including educational institutions, businesses, and government agencies.

## MATERIALS & METHODS

we propose a system that can recognize images at high accuracy with pre tainted face recognition model, using modern techniques and also to update the attendance in the database so it can be accessed easily .the system is designed to detect multiple objects at the same time and also update their attendance and their present of attendance is generated automatically
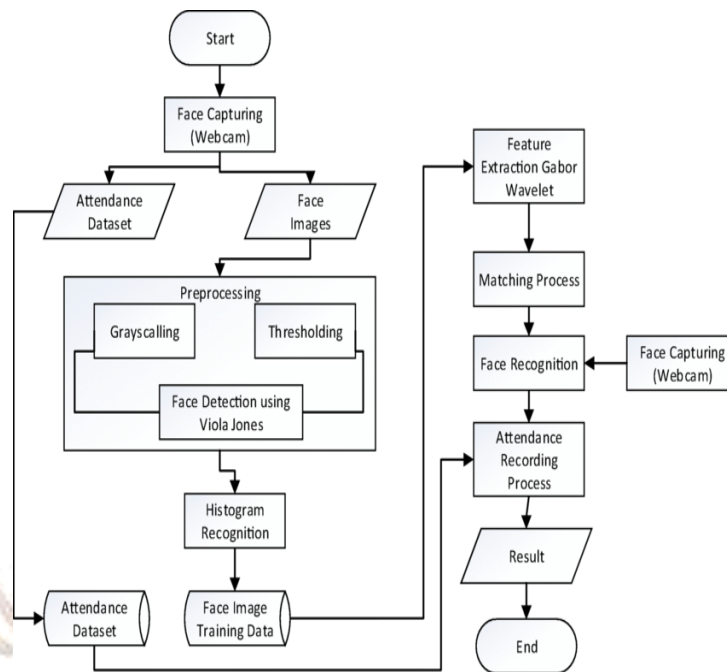
FIG1: BLOCK DIAGRAM

## 1. FACE DETECTION

Face detection here is performed using OpenCV (cv2) tools for detecting faces in images and videos. The cv2 library includes pre-trained face detection models such as Haar cascades and deep learning-based models like the Single Shot Multibox Detector (SSD) and the You Only Look Once (YOLO) algorithm. These models can detect faces in real-time with high Haar cascades based on features like edges, lines, and corners, which are extracted from the image using a sliding window technique. The trained model then uses these features to detect faces in the image. Deep learning-based models like SSD and YOLO use neural networks to detect faces by processing the image in a single pass. These models can detect faces in real time with high accuracy.

## 2. DATASET CONVERSION

a dataset is the collection of images of all users are converted into Histogram encodings, and stored for further use in a database to match the images in the run time of the camera . Since grayscale is used to create Histogram encodings, RGB images will first be converted to grayscale images. Histogram encodings are the measurement got by analyzing each image. they make the process faster rather than computing encodings all the time of execution.

## 3. DATABASE

The database stores the facial images of all registered users. The database is properly designed to ensure the accuracy and efficiency of the face recognition attendance system. The database can handle a large number of users and their corresponding facial images. and designed to facilitate quick searches and comparisons of the facial features of the students. It also records the attendance of students and calculates the average of each user and stores them under a specific user. so it can be accessed easily

## 4. FACE RECOGNITION

faces in the cameras are detected using the Viola-Jones algorithm can detect faces in real-time with impressive speed this algorithm works on grayscale images .In their approach, Viola and Jones exploited Haar-like properties to find faces. It involves two steps 1. training 2. detection. Viola-Jones was designed for frontal faces, so it can detect frontal the best rather than faces looking sideways, upwards, or downwards and  Histogram of Oriented Gradients — or just the HOG method, HOG is used to uniquely identify every pixel of the images to generate encodings of the faces. The Histogram encodings are compared with the data set of encodings present in the database. And it returns the best match of the encodings user name.
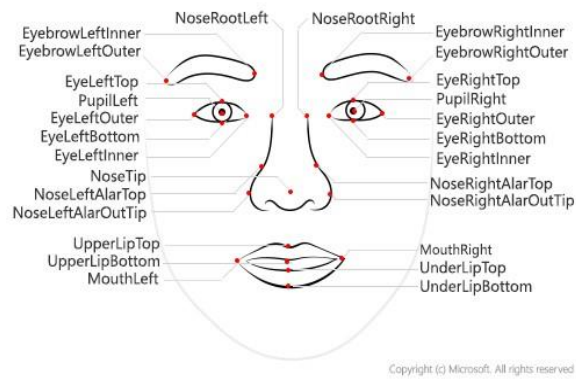
FIG2: FACE ANALYSIS

Deep Conversional Neural Network technique will be used, and for each face 128 measurements were obtained. The measurements of the faces that were present in the image that was previously recorded in the database will be compared with the measurements of the faces that were present in the frame.
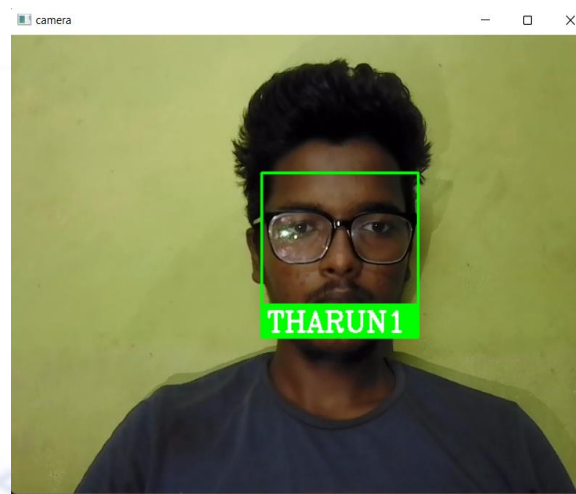


FIG3: FACE RECOGNITION

## 5. ATTENDANCE

After the completion of the recognition the attendance will be marked in the database and the average attendance is calculated for each student. which is used to easily identify their status.

## 6. SECURITY AND PRIVACY

Faces cannot be encrypted, in contrast to many other types of data. The histograms generated, however, cannot be decrypted. Because faces cannot be easily changed, unlike passwords and credit card numbers, data breaches using facial recognition data raise the risk of identity theft, stalking, and harassment.

## RESULT

The user can communicate with the system using the GUI with the user and admin login to view their details. It is a completely automated system it is programmed to take attendance at specific time intervals. The system is designed to take attendance for both teachers and students. store them under each specific user and calculate their average attendance. The database can be accessed only through admins if the admin needs the report of a specific person it can be retrieved easily. The system is designed to take attendance of several students at the same time if the system find some new faces it will notify the admins using through message.

## CONCLUSION

The face recognition attendance system has emerged as an innovative solution to traditional attendance systems, which require physical presence and manual record keeping. This system is based on biometric technology that uses facial features to identify individuals and record their attendance. In terms of security, the face recognition attendance system offers several advantages over traditional attendance systems. It ensures that only authorized individuals can gain access to restricted areas or perform specific tasks. It also provides a digital trail of attendance records, making it easier to monitor and track employee movements.

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