

# Facial Recognition

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**Abstract:** Face recognition is one of the most commonly used computer vision applications. This is a fundamental problem in computer vision and pattern recognition. During the past decade, several facial feature detection methods have been introduced. In recent years, advances in deep learning and convolutional neural networks (CNN) have led to advances in providing highly accurate facial recognition solutions. Facial recognition is a computer technique that determines the location and size of people's faces in digital images. For an image, the purpose of face detection is to determine if a face is present and return a bounding box for each detected face (see Object Detection). Face detection is the first step required in face analysis algorithms such as face registration, face recognition, face verification and face analysis. In addition, facial recognition is used in several fields such as content-based image retrieval, video coding, video conferencing, mass video surveillance, and intelligent human-computer interfaces.

**Keywords:** Android application/website, internet service, CNN, python, AI / ML etc

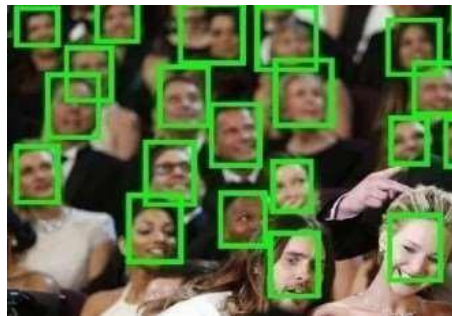


Fig-1: Detection with a deep convolutional network, achieving higher call off faces even and headpose variations

## I. INTRODUCTION

A face recognition model that takes input images and the resulting output image is the face detected in the image. Facial recognition is a computer vision technique that helps identify/visualize human faces in digital images. This technique is a special use case of the object recognition technique, which deals with the detection of occurrences of certain classes of semantic objects in digital images and videos. With technology, facial recognition has grown in importance, especially in areas such as photography, security and marketing.

## II. PAPER OVERVIEW

Facial recognition is a technology that recognizes or detects human faces in digital images. Face recognition is done using classifiers. A classifier is basically an algorithm that decides whether a given image is positive (a face) or negative (no face). The classifier must be trained on thousands of images with and without faces. Fortunately, OpenCV already has two pre-trained face recognition classifiers that can be easily used in the program. A typical example of face recognition happens when we take a picture with our smartphone and it immediately recognizes the face in the picture. Facial recognition is different from facial recognition. Face detection only detects the presence of a face in an image, while face detection involves detecting whose face it is and shows the details. Faces convey extremely rich information that is critical for complete social interaction. To effectively extract this information, faces should be easily recognizable from a complex image.

### III. LITERATURE SURVEY

This paper is specially made for the students & people safety purpose. Now a days, millions of children are going to school for their educational purpose & also millions of people are going to workplace for their daily wages purpose. So, we need to develop a different types of system for the students & people safety purpose. This system used to track the location of vehicle or nearby any vehicle. This system helps to find the exact or current location of students & people by using Google map. Peoples & students safety is most important for their parents & guardians as well as schools & colleges authorities also for personal reasons. The application work as personal digital assistant. This paper presents the working flow of the Research. Vehicles tracking system Paper is an Android based. Morden bus tracking system generally used GPS technology for the tracking route and location of the bus via goggle maps. These application is easy to handled and user friendly. By using internet we can view vehicle information. The paper also purposes of security system and drive prevention system. It's totally based on goggle Maps and API's. It's more accurate to check or track the current location of persons/students & drivers as well vehicles. This application gives brief idea about the routes, vehicles locations with online attendance features. It is more accurate to check or track the current location of students & persons.

This can also be seen as a pre-processing step for difference modelling and pattern classification applications in ML. For efficient separation of two or more classes with multiple features, the linear discriminant analysis model is considered the most popular technique for solving such classification problems. For example, if you have two classes with multiple functions and need to separate them efficiently. Classifying them based on a single characteristic may result in some overlap.

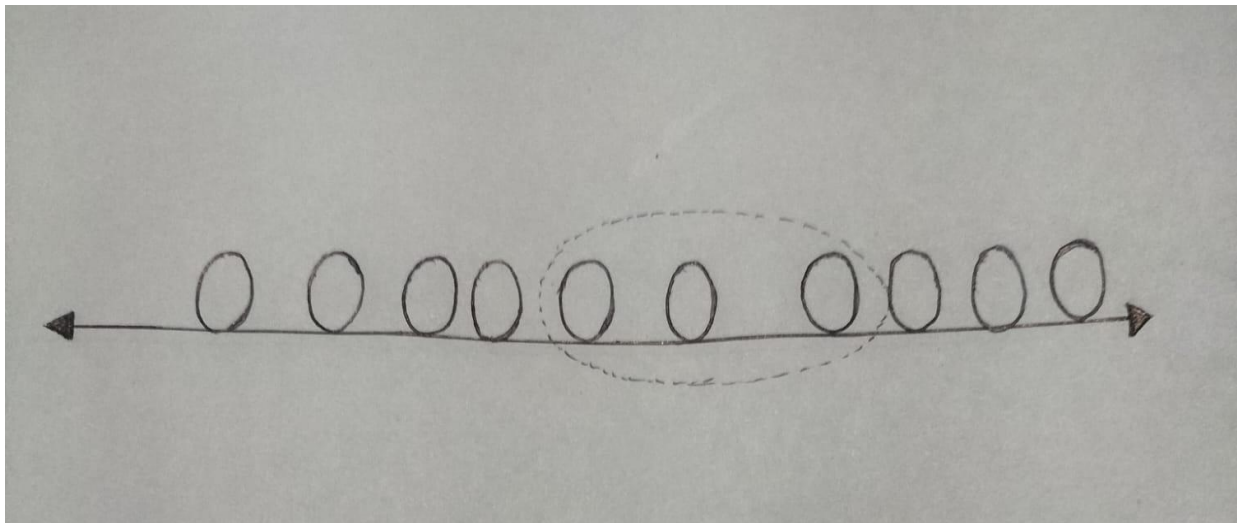


Fig. 2 Overlapping

### IV. PROPOSED SYSTEM

Participants in the class must register by providing the necessary information. Then a dataset is created and contains those photographs. Faces are identified from the classroom's live streaming footage during each lesson. Images of recognised faces are compared, and if a match is found, each student's presence is noted. A list of those who missed each session will be forwarded to the teacher who was in charge of it. The suggested system's system architecture is displayed below.

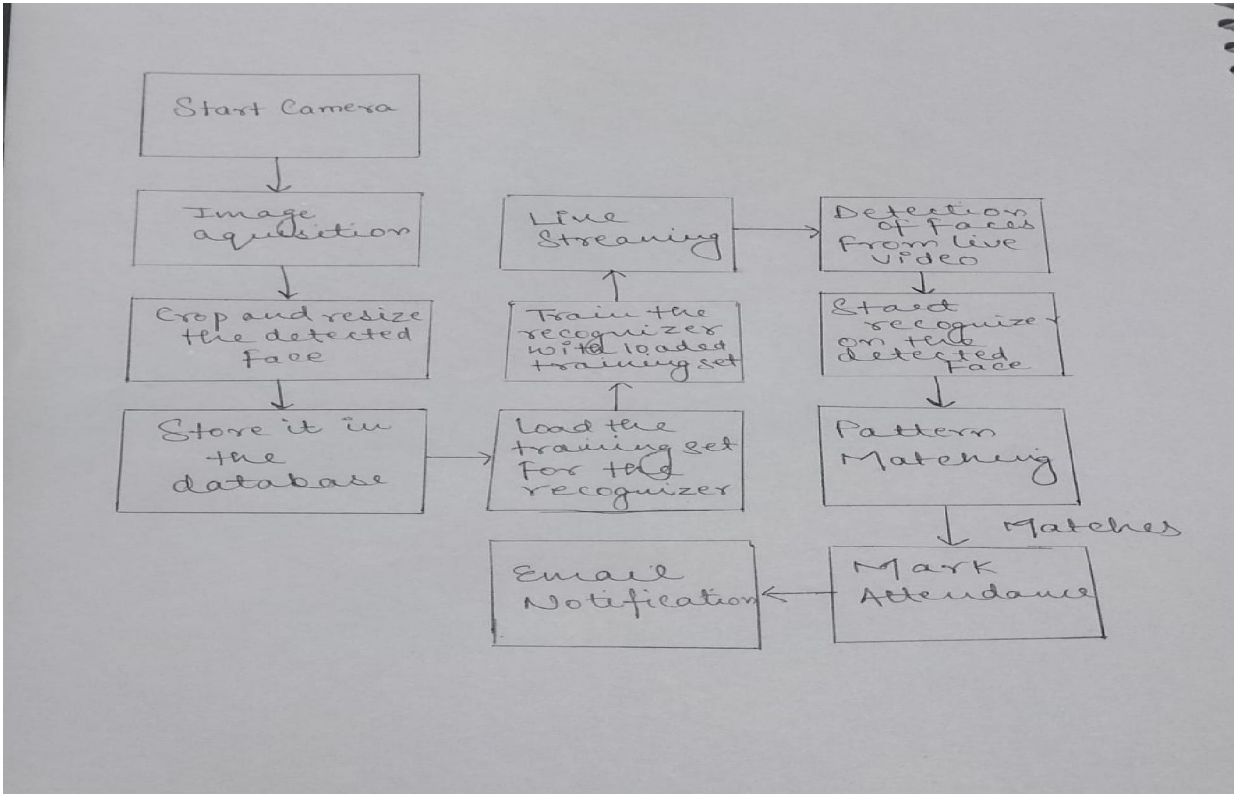


Fig.3 Flowchart

**Hardware specifications:** 8GB RAM • Processor - 1.5 to 4.5x • Monitor – 15.6 inch • Keyboard - 2.4 GHz USB wireless receiver

**Software specifications:** Python compiler with required libraries and modules • Language: Python • Operating System: Windows 7/8/10/11 (Linux recommended) • computer vision • OpenCV • tensorflow.

The Haar-Cascade Classifier with OpenCV is used to recognise faces in this example. Before it can be utilised for face detection, the Haar Cascade algorithm must be taught to recognise human faces. This is known as feature extraction. The haar cascade training data utilised is in the form of an xml file called haarcascade\_frontalface\_default. Easy to learn and use, Python provides an easy way to define how high-level abstractions are linked together. TensorFlow nodes and tensors are Python objects, and TensorFlow applications are Python programs.

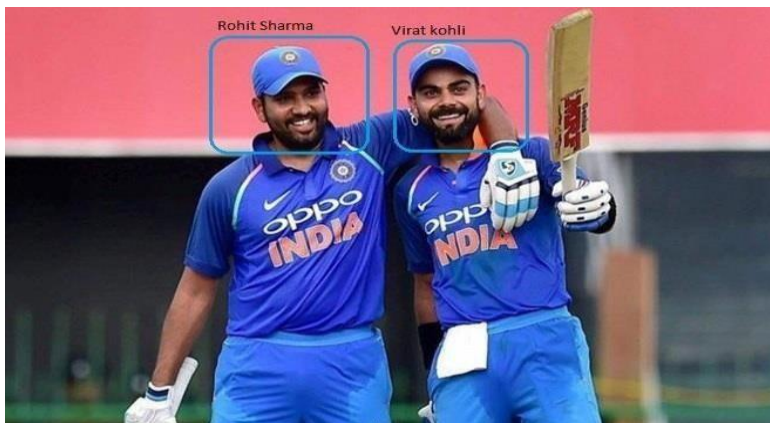
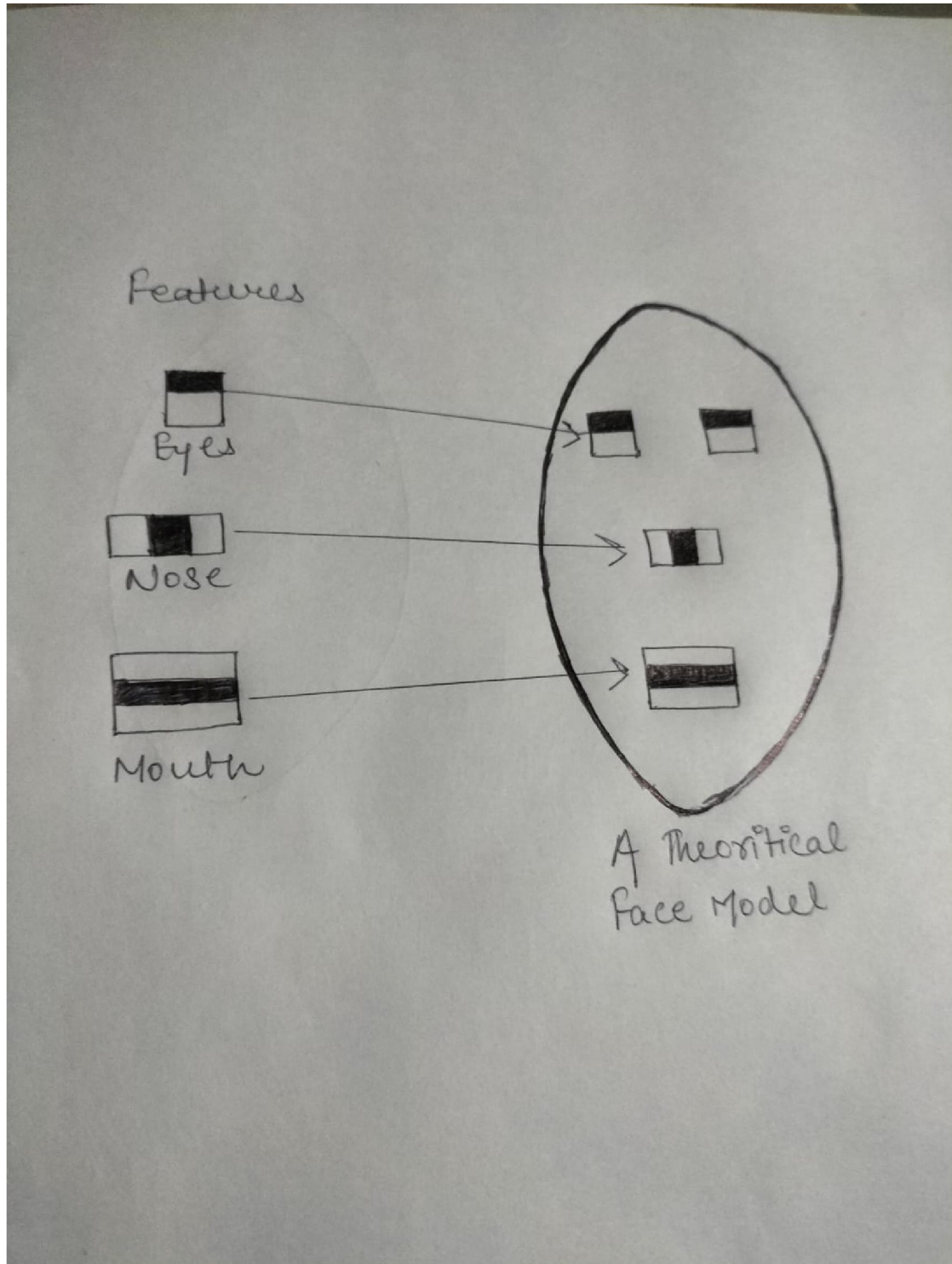


Fig. 4 Face Detection

The transformation library provided by TensorFlow is developed with high-performance C++ binaries.

Python simply routes communication between components and provides high-level programming abstractions to wire them together.

New APIs make it easier to implement distributed training, and TensorFlow Lite support allows you to deploy your models on a variety of systems.



## V. RESULT

Facial recognition is a computer technique that determines the position and size of human faces in digital images.

TensorFlow and OpenCV:

- OpenCV and TensorFlow can be used together to develop and deploy computer vision applications.

Deep learning attempts to mimic the human brain, albeit far from matching its capabilities, allowing systems to aggregate data and make predictions with incredible accuracy. to

Modules downloaded to create the environment:

OpenCV:

OpenCV is a huge open source library for computer vision, machine learning and image processing, which plays a key role in the real-time operations that are so critical in today's systems.

tensorflow:

TensorFlow is an open-source, end-to-end platform for building machine learning applications. It is a symbolic math library that uses dataflow and differentiable programming to perform a variety of tasks focused on training and inferring deep neural networks.

## VII. APPLICATION

- Crowd control. Facial recognition is used to identify and analyze crowds in crowded public and private areas.
- Human Computer Interaction (HCI). Some systems based on human-computer interaction use facial recognition to detect human presence.
- photograph. Some newer digital cameras use face detection for autofocus. The mobile app uses facial recognition to identify areas of interest within your slideshow.
- Facial feature extraction. Facial features such as nose, eyes, mouth, and skin tone can be extracted from images.
- Gender classification. Applications have been developed to detect gender information using facial recognition techniques.
- Face recognition. Facial recognition systems are designed to identify and verify individuals based on digital or video images.

## VIII. CONCLUSION

Overall, this paper successfully demonstrated how to implement LBPH in Django to create a web application. Once implemented, it can be used to record student attendance and track attendance records. This Paper may be further developed in the future by adding more features for students and teachers. You can also add features such as assignments, results, and grades.

As this become a small-scale mission, facts shape and implementation did now no longer have many problems. However, it took the writer many attempts with studies and have a look at with one of a kind technology wished as those equipment and technology had been new to the writer. This brought on a postpone withinside the improvement of the mission.

Despite the postpone and difficulties, the writer become capable of contain the ones equipment and technology and entire the mission. However, the fulfillment price of facial popularity become now no longer as expected. The fulfillment price depended upon the best of the camera, lighting, and enough dataset withinside the database. When those elements had been to be controlled properly, the fulfillment price of face popularity increased.

The attempt that went to examine and studies approximately LBPH and Django and different equipment and technology become really well worth it. While the technique of getting to know and imposing become overwhelming, it began out to be exciting because the mission began out to reveal a few results. This mission gave the writer first-hand enjoy in operating on a mission the usage of Django and determined Django simpler and greater scalable.

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