

# Smart Suspect Tracker Using Deep Learning Model

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## Abstract

Each human progress requires a problem free environment since it influences all components of monetary and social turn of events. Quite possibly the main work in keeping a serene local area is finding lawbreakers. In India, finger impression ID is the most part used to distinguish lawbreakers. In most of the cases, The fact is that most Suspects these days are becoming more skilled at trying not to leave their thumbprint on the scene, this type of recognizable proof is restricted. CCTV cameras, have been placed in number of public spots and confidential spots to give reconnaissance activities. CCTV can be used to distinguish the denounced rapidly. we give a Profound Learning model to find the criminal location. It's a two-step process: In camera photos, countenances of individuals are first distinguished and afterward perceived. This method might be utilized in an assortment of surveillance cameras in different areas to persistently screen and look for hoodlums inconspicuous. The police headquarters will be cautioned of a suspect's whereabouts after the person in question has been distinguished. The police headquarters will be cautioned of a suspect's when he/she has been found.

## Introduction

Quite possibly of the most major problem in the ongoing society is that of assurance. With an expansion in the charge of violations and fear-based oppressor activities, there is a far reaching up push of dangers to society. Despite the fact that there are a few strategies for recognizing an individual, biometric ID methodology have acquired notoriety because of the accuracy and uniqueness of biometric parts. Finger impression acknowledgment, voice acknowledgment,

palm acknowledgment, iris and voice acknowledgment, and iris and voice acknowledgment are all biometric character draws near. Face acknowledgment disposes of the necessity for people to look at an iris scanner or lay their hands on a unique finger impression per user. Face acknowledgment calculations can likewise be very helpful in film caught through observation and applications. In this case, we'll physically save a few photos or videos of the convicts, alongside their data, in our data set. Introducing a reconnaissance camera in a public spot that looks at the information countenances to a criminal data set and conveys a caution in the event that the discoveries match. Assuming any photo or video fits the suspect's data in the data set, we can assume that the person is the culprit. Besides, facial acknowledgment frameworks are advancing toward the cutting-edge savvy climate, wherein PCs are intended to normally connect with people more.

### **Problem Statement**

To construct a suspect location framework model which acknowledges the facial information of suspects as the contribution from the client also, cautions the specialists upon acknowledgment of the substance of suspect from the information photograph or video transfer and illuminates no suspect tracked down in the event that on the off chance that the suspect is absent in the given information stream.

### **Literature Survey**

In the past, there have been many system which are used for crime data analysis, crime detection and crime identification.

The authors, Tayal et al., employed data mining with the Weka tool to apply k means on the crime dataset

in their study "Crime detection and criminal identification in India using data mining techniques." Crime prediction is carried out after cluster identification. The knn classification is used for prediction. The accuracy of the classifier was found to be between 93.62 and 93.99 percent. Using Google Maps the clusters are represented across the map. But, the prediction not useful enough, because markers can give us only the number of crimes took place in particular area.

The Authors Kian Raheem Qasim and sara salman Qasim's have presented a face identification system

which uses fast algorithm. This model uses two databases namely 1) Olivetti research Laboratory (ORL) and 2) Unconstrained Facial Images (UFI). ORL contains 400 images which are of 92x92 pixels. In this 400 images, nine images are used for training purpose and one image is used for testing purpose. UFI contains of 401 images which are of 128x128 pixels. In this seven images are used for training purpose and one image is used for testing purpose. The captured image is converted in to HSV system from there force field features are extracted from the image. three distance methods are used for classification. They are: 1. Manhattan, 2. Euclidean, 3. cosine.

If no fingerprints were found at the crime scene, the authors of this article used CCTV footage and compared

the images from the tape with a criminal database. This system is divided into five stages, the first of which is planning, in which the why and how of the system are examined. In second step of requirement analysis the requirement to the system design is considered. The third step was design, when they established the system design and workflow. The fourth and most crucial stage is implementation and testing. The system is developed and tested using the principal component analysis technique. Maintenance is the final stage; this phase was skipped because the system was built in a controlled setting. The authors employed the PCA technique to discover similar elements in images of film for criminal identification. If FRCI recognises a face, it will use a database that holds the person's personal information to show the person's information. Visual studio and MATLAB R2013b are used to create the system interface. The accuracy obtained by using this approach is 80 percent.

### Existing System

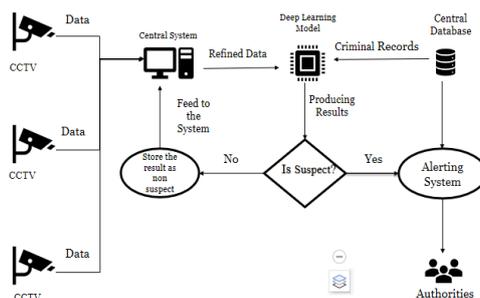
- Existing approach of the project is based on image recognition. Which means, to determine a subject as an innocent or as a suspect, existing application takes the input from pile of captured photographs.
- This already present version of the project uses packages such as tkinter to build the graphical user interface. User is incapable of utilizing the software remotely as entire data is stored and retrieved using file base storage system.
- In existing approach we detect suspects based on thumb impression. However, this type of identification is constrained as most of criminals nowadays getting clever not to leave their thumbprint on the scene.

### Proposed System

From road cameras to shopping center cameras, our idea may be adjusted and incorporated into various observation frameworks all over the planet. All of the enrolled camera frameworks can send their visual information to a focal data set, where calculations run on various PCs 24 hours per day, seven days every week, getting criminal history from a tremendous data set. Specialists will be told of the general setting of the suspect locating.

1. System Architecture
2. Proposed Modules
3. Working Of the System
4. Algorithm

### System Architecture

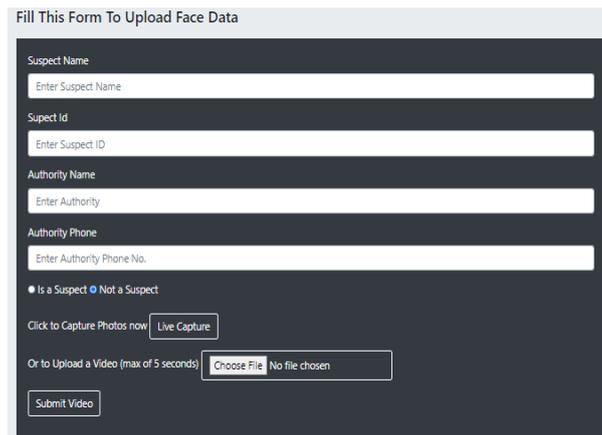


## Proposed Modules

The proposed model consists of the four modules. They are:

1. Face Data Collection
2. Face Detection
3. Face Recognition
4. Alerting System

## Face Data Collection



Fill This Form To Upload Face Data

Suspect Name  
Enter Suspect Name

Suspect Id  
Enter Suspect ID

Authority Name  
Enter Authority

Authority Phone  
Enter Authority Phone No.

Is a Suspect  Not a Suspect

Click to Capture Photos now

Or to Upload a Video (max of 5 seconds)  No file chosen

## Face Detection

Haar cascade algorithm is utilized for recognizing the countenances that are gathered from suspect information. This calculation as it were distinguishes the state of face from an image. Utilizing this calculation we have edited the image to a degree that main face of the suspect is noticeable. This way we can send unadulterated face information to preparing calculation.

## Face Recognition

During acknowledgment process, with the assistance of OpenCV module will get input information from camera and the appearances identified in the information are characterized. Whenever a suspect goes into the edge, recogniser will send a caution to particular specialists utilizing twilio Programming interface.

## Alerting System

In the event that a suspect is perceived, a sms alert is sent utilizing twilio application. Twilio Programming interface is utilized to create alert at the point when a suspect is distinguished by the recogniser.

## Functional Requirements

A Practical Necessity is a depiction of a framework's various functionalities, administrations, and obligations. It is accumulated as a practical prerequisites record from the client, and the designers work on carrying out the expected highlights in general and administrations. It gives data about the information gave as contribution to the framework, the administrations given by the framework at each level, the general work process, and the results created at each stage.

Coming up next are the venture's useful prerequisites:

- The site ought to incorporate a short depiction of the item and its activity so the end client has a wonderful encounter.
- An administrations tab on the landing page of the site where the framework's all's capabilities can be open.
- A camera should be introduced and associated with the gadget where the model is put away to utilize the live suspect face acknowledgment highlight.
- With administrator access, the client will actually want to make an administrator record and view the information of the enrolled suspects, as well as modify the subtleties.
- Approval of the transferred structure information is required, and it ought to possibly be acknowledged whether it is right.
- Assuming there are no problematic subtleties, the train model ought to provoke you to give them, and on the off chance that there is information, it ought to start preparing.
- Assuming that there are no countenances prepared, the perceive button on the site page ought to provoke to enter train the model, and in the event that the model is now prepared, it ought to begin the camera and perceive.
- When the suspects have been taught and perceived, the subtleties of the suspects should be displayed on the site page.
- An alarm ought to be shipped off the legitimate power's telephone number gave during the individual's enrollment.

### **Non-Functional Requirements**

These are significantly worried about the details that the framework gives notwithstanding the fundamental center usefulness of the website. These effects no center administrations given by the framework yet upgrades them.

In straightforward, they manage the abilities and limitations the framework can display when functionalities are expanded or diminished. These fundamentally incorporate presentation and versatility, ease of use, transportability, security, unwavering quality and so forth.

### **Usability**

A framework's convenience connects with how simple it is for a client to use it. The framework is planned so that the client is never confronted with an issue. Any client with minimal specialized information can promptly get to the suspect location framework when the framework is introduced in his PC, which is a one-time process. The person needs to do just beginning the server and glue the URL into the program; the site page will show up, and every one of the buttons on the landing page and administrations page will be plain as day.

### **Security**

It is to determine the security of data once it has been entered into the system. Except for the person with administrator credentials, no other user can see the data once it has been entered.

### Reliability And Availability

Failures that may arise when using the system are addressed, as is the method for getting it back up and running. The website design ensures that it responds to all types of input and provides error pages and redirects if incorrect input is provided. If there is any change in the source code of python libraries, the code can be simply updated by altering python files and saving it, then reloading gives the right webpage in no time.

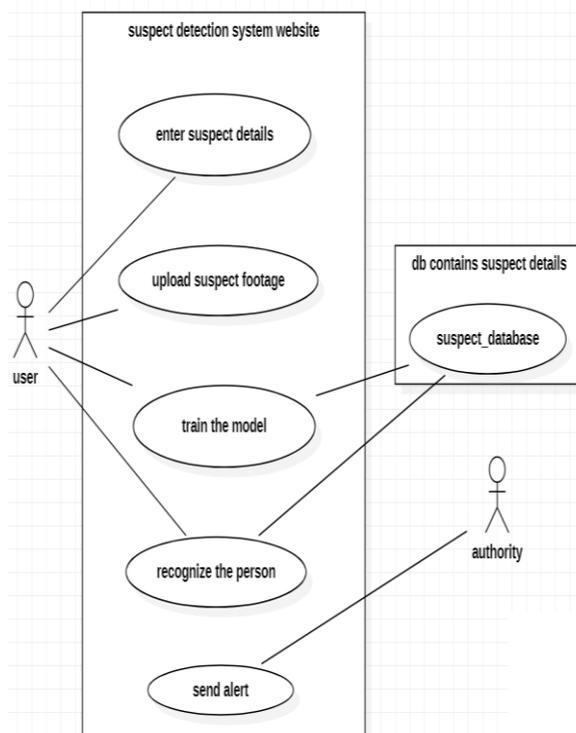
### Low Cost

It's critical to create a low-cost system without sacrificing website quality so that it can be made available to everyone who needs it. We constructed this model for a low cost utilising Python's open-source modules, and we only had to pay for the integration of an alerting system into the model for long-term use at a fair cost. The user can use this function for a limited time without paying, but they must pay to use it in the long run.

### Use Case Diagram

The utilization case chart is a significant part of framework displaying since it assists with catching

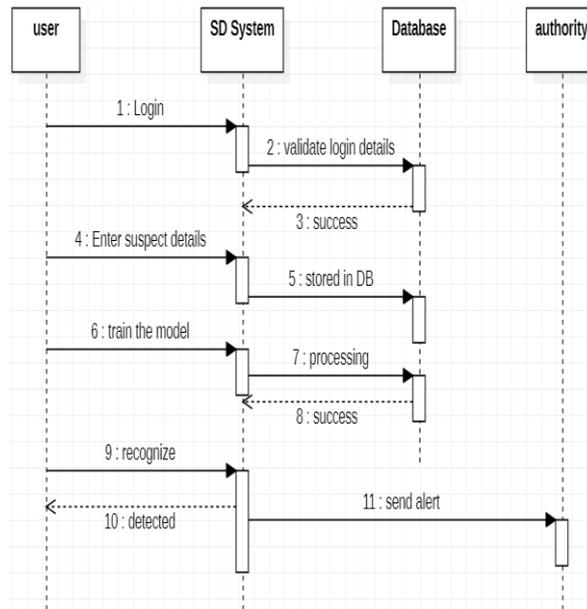
the powerful person of the framework. The utilization case charts are for the most part utilized for social occasion necessities, laying out a client's perspective on the framework, distinguishing inward and outside factors that might straightforwardly affect the model, and envisioning how entertainers collaborate with the framework's highlights.



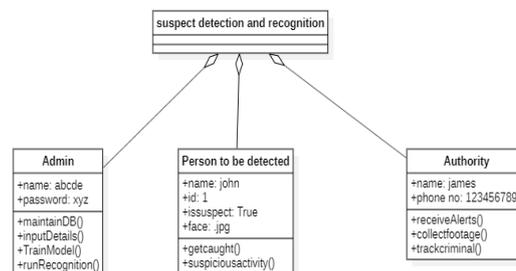
Sequence Diagram

A sequence diagram depicts how and in what order the objects interact. They're utilized to figure out what a new system's specifications are. Event diagrams are another name for them. The sequence diagrams define a set of activities that a system may execute by interacting with its actors, including variations.

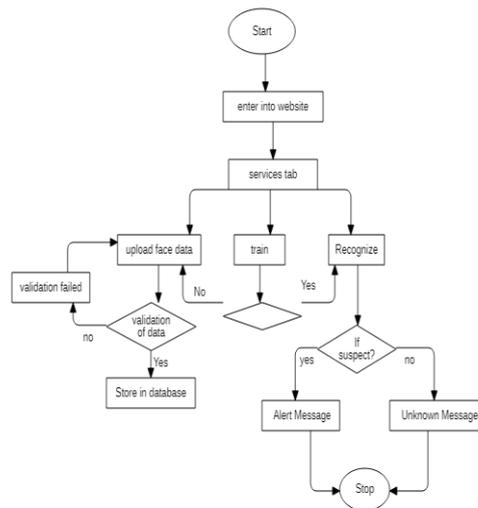
### Object Diagram



Object charts are dependant on class graphs since they are made from them. An item chart is a portrayal of a class outline. The fundamental ideas in class and item charts are something very similar. Object graphs show a framework's static viewpoint too, yet this view is a preview of the framework at a specific time. Object outlines are utilized to address a gathering of items and their associations. Then again, a class chart portrays a theoretical model comprised of classes and their connections. An item graph, then again, portrays what is going on at one point in time.



### Module Design



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