Criminal Detection System Using ML

A Project Work

Submitted in the partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

IN

INTERNET OF THINGS

Submitted by:

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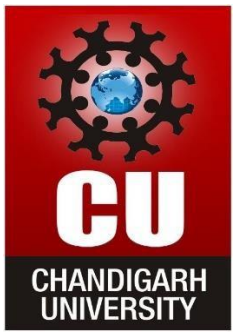
Under the Supervision of :

Mr. Somsirsa Chatarjee



APEX INSTITUTE OF TECHNOLOGY

CHANDIGARH UNIVERSITY,GHARUAN,MOHALI - 140413

PUNJAB

DECLARATION

I, **MAHTAB ALAM**, student of 'Bachelor of Engineering in INTERNET OF **THINGS'**, **session: 2017 - 2021** , Apex Institute of Technology, Chandigarh University, Punjab, hereby declare that the work presented in this Project Work entitled 'Criminal Detection system**'** is the outcome of our own bonafide work and is correct to the best of our knowledge and this work has been undertaken taking care of Engineering Ethics. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

MAHTAB ALAM

UID: 17BCS4555

Date: 29 feb 2021

Place: CHANDIGARH UNIVERSITY

CERTIFICATE

This is to certify that the work embodies in this dissertation entitled *'Criminal Detection System '* being submitted by **MAHTAB ALAM, Roll Nos. – 17BCS4555** for partial fulfillment of the requirement for the award of **Bachelor of Engineering in Internet of Things** discipline to Apex Institute of Technology, Chandigarh University, Punjab during the academic year 2017 - 2021 is a record of bonafide piece of work, undertaken by him/her the supervision of the undersigned.

Approved and Supervised by

Signature of Supervisor

Mr. Somsirsa Chatarjee
Assistant professor, AIT

Forwarded by

Dr. Gurjot singh
Professor & project co-ordinator

EXTERNAL EXAMINER

Signature of External Examiner

ABSTRACT

This project aims to build a Criminal Face Detection system by leveraging the human ability to recall minute facial details. Identification of criminals at the scene of a crime can be achieved in many ways like fingerprinting, DNA matching or eye witness accounts. Out of these methods eye witness accounts are preferred because it stands scrutiny in court and it is a cost – effective method. It is possible that witnesses to a crime have seen the criminal though in most cases it may not be possible to completely see the face of the perpetrator.

In most crimes, criminals may wear a mask which covers a majority of their face, they may first bind and blind – fold their victims or they may confine victims in a room before crimes are committed. In other cases a witness may simply notice the perpetrator in a passing glance and thus may not be able to recall many facial details. In such cases it is useful to show witnesses slices of the face like the nose, ears, lips, eyes, etc to see which triggers memory.

The system will be built of an existing criminal database. High resolution images from the criminal database will be sliced down into the different components and flashed in front of the witness. Witnesses may recall specific features and seeing high resolution images of the same will help identify the perpetrator of a crime. Each sliced image will be connected to a criminal profile and thus can give a vital clue in difficult criminal investigations.

In the event that a witness is unable to definitively point to one criminal face, the system will also allow for the generation of a possible face for the criminal using the sliced images available in the system.

Acknowledgement

The success and final outcome of this project required a lot of Guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to such supervision and assistance and I would not forget to thank them.

I respect and thank **Mr. Somsirsa chatarjee**(Assistant Professor,AIT), for providing me an opportunity to do the project work in CHANDIGARH UNIVERSITY and giving us all support and guidance which made me complete the project duly. I am extremely thankful to him for providing such a nice support and guidance, although he had busy schedule.

I am thankful to and fortunate enough to get constant encouragement, support and guidance from all the Teaching staffs of **APEX INSTITUTE OF TECHNOLOGY** which helped us in successfully completing our project work. Also, I would like to extend our sincere esteems to all staff in laboratory for their timely support

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INTRODUCTION

Problem Statement:

The problem statement should state what is to be done and not how it is to be done. It should be a statement of needs, not a proposal for a solution. A user manual for the desired system is a good problem statement. The requestor should indicate which features are mandatory and which are optional, to avoid overly constraining design decisions. The requestor should avoid describing system internals, as this restricts implementation flexibility. Performance specifications and protocols for interaction with external systems are legitimate requirements. Software engineering standards, such as modular construction, design for testability, and provision for future extensions, are also proper.

PURPOSE OF THE PROJECT:

This project is aimed to identify the criminals in any investigation department. Here the technique is we already store some images of the criminals in our database along with his details and that images are segmented into many slices say eyes, hairs, lips, nose, etc. These images are again stored in another database record so to identify any criminals; eyewitnesses will see the images or slices that appear on the screen by using it we develop the face, which may or may not be matched with our images.

If any image is matched up to 99% then we predict that he is only the criminal. Thus using this project it provides a very friendly environment for both operator and eyewitness to easily design any face can identify criminals very easy.

PROJECT OBJECTIVE:

This project is intended to identify a person using the images previously taken.

The identification will be done according the previous images of different persons.

PROJECT SCOPE:

The scope of the project is confined to store the image and store in the database. When a person has to be identified the images stored in the database are compared with the existing details.

HARWARE SPECIFICATION

- Hard Disk – 2 GB
- RAM – 1 GB
- Processor – Dual Core or Above
- Camera
- Mouse
- Keyboard
- Monitor
- Printer

SOFTWARE SPECIFICATION

- Windows XP
- Anaconda
- Oracle

Technology Used

- Python
- mysql

LITERATURE SURVEY

Existing system

There is no dedicated system to assist in facial detection of criminals rather police technicians have to go through to different pictures of criminals and manually slice each picture to generate images, this will usually lead to the generation of low resolution and blurred images. Linking of each sliced image to the original image is also a herculean task. The system is ineffective because a witness will not be able to continually peruse the different images rather they will receive a broken stream of images and randomness of the sliced image is not achievable.

Proposed system

This system is most effective when a witness can go through sliced images in a constant flow at one sitting. In the proposed system all the criminal images are sliced beforehand and kept ready for instant viewing. Since the images are preloaded into the system the images can be randomly viewed thus making the system more effective. Every sliced image will be linked to the original image and details of the criminal. In addition a new face can be generated by using the different sliced images to create a possible face for the criminal.

Modules

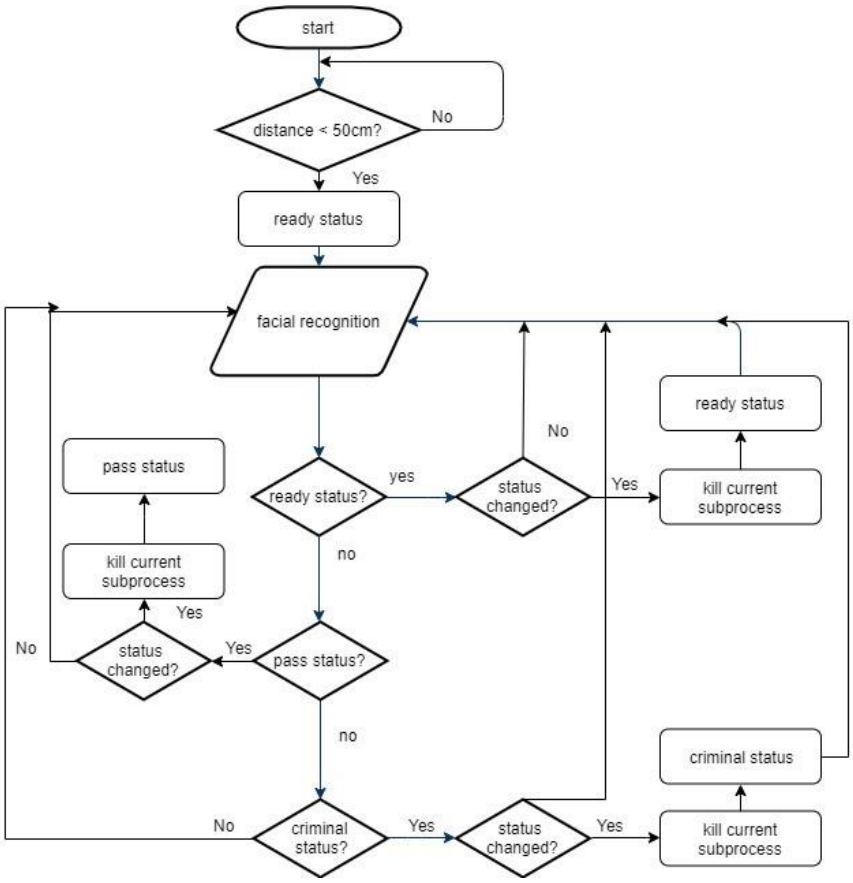
Witness: The witness module is where an eyewitness interacts with the system and identifies sliced images.

Investigator: The investigating officer or a subordinate will use this module to maintain the criminal database by adding, deleting or updating criminal records with pictures. This module can also be used to generate a possible face if a witness is unable to identify it based on the sliced images.

Admin: The admin will control the access to the system. The admin can create user ids and passwords for investigating officer and ensures authenticated access.

SYSTEM ANALYSIS & DESIGN

FLOW CHART



ALGORITHMS USED

There is an algorithm, called **Viola–Jones object detection framework**, that includes all the steps required for live face detection :

- **Haar Feature Selection**, features derived from Haar wavelets
- **Create integral image**
- **Adaboost Training**
- **Cascading Classifiers**

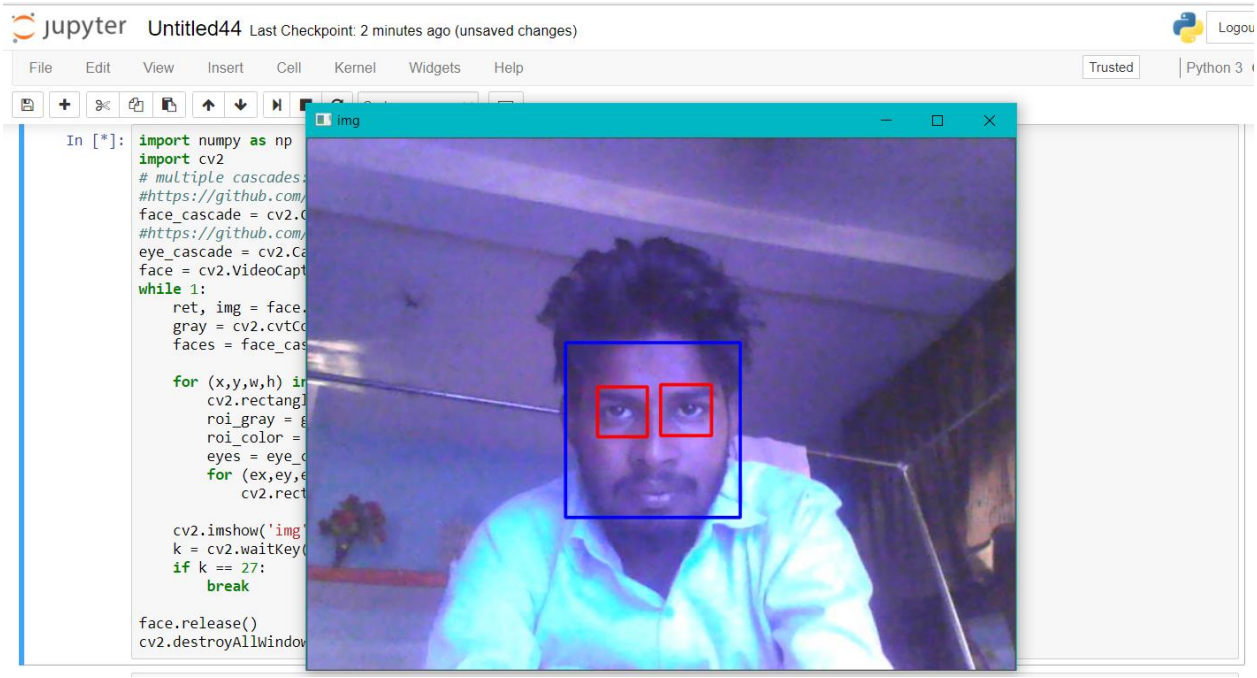
Source Code:

```
import numpy as np


import cv2


# multiple cascades:
https://github.com/Itseez/opencv/tree/master/data/haarcascades


#https://github.com/Itseez/opencv/blob/master/data/haarcascades/haarcascade_f
rontalface_default.xml


face_cascade =
cv2.CascadeClassifier('Desktop\prj\haarcascade_frontalface_default.xml')


#https://github.com/Itseez/opencv/blob/master/data/haarcascades/haarcascade_
eye.xml


eye_cascade = cv2.CascadeClassifier('Desktop\prj\haarcascade_eye.xml')


face = cv2.VideoCapture(0)
```

```
while 1:

    ret, img = face.read()

    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

    faces = face_cascade.detectMultiScale(gray, 1.1, 21)



    for (x,y,w,h) in faces:

        cv2.rectangle(img,(x,y),(x+w,y+h),(255,0,0),2)

        roi_gray = gray[y:y+h, x:x+w]

        roi_color = img[y:y+h, x:x+w]

        eyes = eye_cascade.detectMultiScale(roi_gray)

        for (ex,ey,ew,eh) in eyes:

            cv2.rectangle(roi_color,(ex,ey),(ex+ew,ey+eh),(0,0,255),2)



    cv2.imshow('img',img)
```

```
    k = cv2.waitKey(30) & 0xff
    if k == 27:
        break

face.release()
cv2.destroyAllWindows()
```

Output:



REFERENCES

https://search.yahoo.com/search;_ylt=Awr9Hr7jgFtgPggAh2qJzbkF?p=algorithm+used+in+criminal+detection+system&fr=mcafee&fr2=p%3As%2Cv%3Ai%2Cm%3Apivot&stype=web

https://search.yahoo.com/search?fr=mcafee&type=E215US997G0&p=name+of+the+algorithm+used+for+face+detection