Guided Assignment On Supervised Learning

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Course: **Artificial Intelligence And Machine Learning**

Batch Four

Duration: **12 Months**

Problem statement: Implement a **face tracking** algorithm using **haar cascade algorithm** and **opencv**. Using haar cascade, first implement a face detection algorithm that counts the total number of faces present in any given frame. Write the **total number of faces detected** on the top left of the image. Further modify the code to track the face if only one face is detected. Make sure that you draw the bounding box corresponding to all video frames. Note: you may need to fine tune the parameters for Haar Cascade Classifier to get optimal results and remove false positives.

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Prerequisites:

The libraries as well as things required in order for the program to work:

I. **Python 3.6** : The following url https://www.python.org/downloads/ can be referred to download python. Once you have python downloaded and installed, you will need to setup PATH variables (if you want to run python program directly, detail instructions are below in how to run software section). To do that check this: https://www.pythoncentral.io/add-python-to-path-python-is-not-recognized-as-an-internal-or-external-command/. Setting up PATH variable is optional as you can also run program without it and more instruction are given below on this topic. Second option is to download anaconda and use its anaconda prompt to run the commands. To install anaconda check this url : https://www.anaconda.com/download/

II. **OpenCV :** OpenCV can be downloaded from the following url: https://sourceforge.net/projects/opencvlibrary/. It is strongly recommended to download OpenCV in a virtual environment.

III. **METHODS USED:**

A. HAAR CASCADE CLASSIFIER

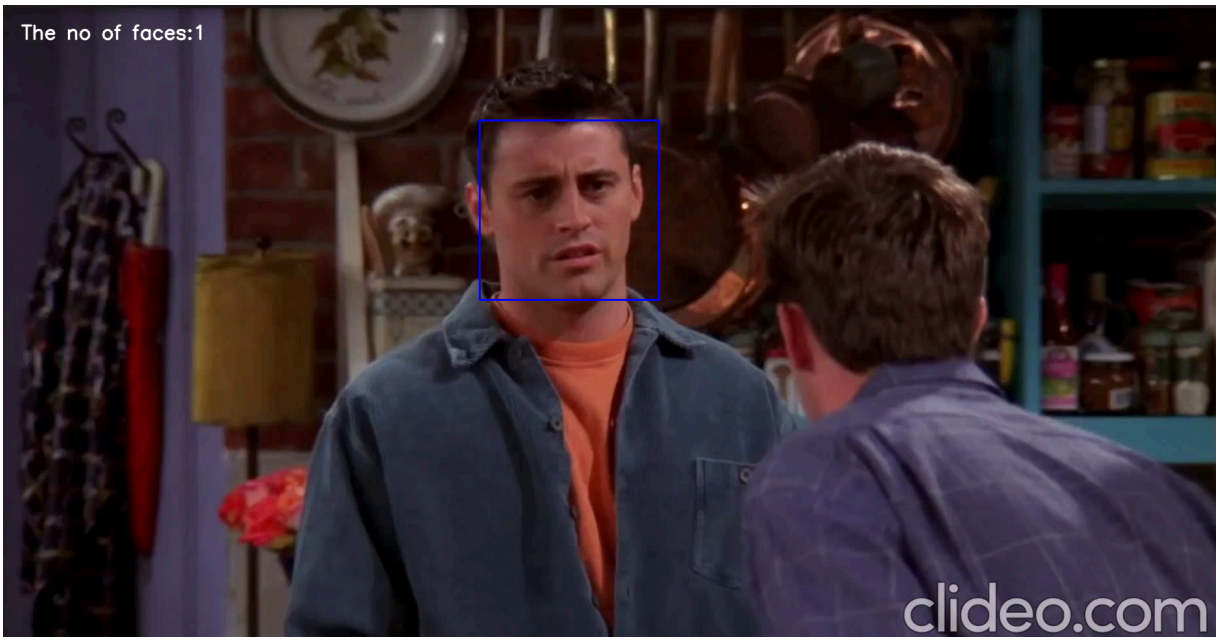
THE PROJECT :

1. Importing the cv2 library. Initialising the detector and reading the video and performing detection.

```
import cv2
detector = cv2.CascadeClassifier("/Users/shreyashrivastava/opt/anaconda3/pkgs/libopencv-4.5.2-py39h852ad08_1/share/opencv4/haarcascades/haarcascade_frontalface_default.xml")
cap = cv2.VideoCapture("/Users/shreyashrivastava/Desktop/sample.mp4")
while True:
    _, img = cap.read()
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    faces = detector.detectMultiScale(gray, 1.1, 7)
    img = cv2.putText(img, 'The no of faces:{}'.format(len(faces)), (30, 100), cv2.FONT_HERSHEY_SIMPLEX,
                      1, (255, 255, 255), 2, cv2.LINE_AA)
    for (x, y, w, h) in faces:
        if len(faces)==1:
            cv2.rectangle(img, (x, y), (x+w, y+h), (255, 0, 0), 2)
        # Display
        cv2.imshow('img', img)
        # Stop if q key is pressed
        if cv2.waitKey(1) & 0xFF == ord('q'):
            break

cap.release()
cv2.destroyAllWindows()
```

RESULTS:




The no of faces:2
clideo.com