Assignment 6

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Develop a python code to detect any object using Haar cascade classifier.

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# import the necessary packages
from imutils.video import VideoStream
from imutils.video import FPS
import numpy as np
import argparse
import imutils
import time
import cv2

# construct the argument parse and parse the arguments
ap = argparse.ArgumentParser()
ap.add_argument("-p", "--prototxt", required=True,help="path to Caffe 'deploy' prototxt file")
ap.add_argument("-m", "--model", required=True,help="path to Caffe pre-trained model")
ap.add_argument("-c", "--confidence", type=float, default=0.2,help="minimum probability to filter
weak detections")
args = vars(ap.parse_args())

# initialize the list of class labels MobileNet SSD was trained to
# detect, then generate a set of bounding box colors for each class
CLASSES = ["background", "aeroplane", "bicycle", "bird", "boat","bottle", "bus", "car", "cat", "chair",
"cow", "diningtable","dog", "horse", "motorbike", "person", "pottedplant", "sheep","sofa", "train",
"tvmonitor"]
COLORS = np.random.uniform(0, 255, size=(len(CLASSES), 3))

# load our serialized model from disk
print("[INFO] loading model...")
net = cv2.dnn.readNetFromCaffe(args["prototxt"], args["model"])

# initialize the video stream, allow the cammera sensor to warmup,
# and initialize the FPS counter
print("[INFO] starting video stream...")
vs = VideoStream(src=0).start()
time.sleep(2.0)
fps = FPS().start()

# loop over the frames from the video stream
while True:
    # grab the frame from the threaded video stream and resize it
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        # to have a maximum width of 400 pixels
        frame = vs.read()
        frame = imutils.resize(frame, width=400)
        # grab the frame dimensions and convert it to a blob
        (h, w) = frame.shape[:2]
        blob = cv2.dnn.blobFromImage(cv2.resize(frame, (300, 300)),0.007843, (300, 300), 127.5)
        # pass the blob through the network and obtain the detections and
        # predictions
        net.setInput(blob)
        detections = net.forward()
        # loop over the detections
        for i in np.arange(0, detections.shape[2]):
                # extract the confidence (i.e., probability) associated with
                # the prediction
                confidence = detections[0, 0, i, 2]
                # filter out weak detections by ensuring the `confidence` is
                # greater than the minimum confidence
                if confidence > args["confidence"]:
                        # extract the index of the class label from the
                        # `detections`, then compute the (x, y)-coordinates of
                        # the bounding box for the object
                        idx = int(detections[0, 0, i, 1])
                        box = detections[0, 0, i, 3:7] * np.array([w, h, w, h])
                        (startX, startY, endX, endY) = box.astype("int")
                        # draw the prediction on the frame
                        label = "{}: {:.2f}%".format(CLASSES[idx],confidence * 100)
                        cv2.rectangle(frame, (startX, startY), (endX, endY),COLORS[idx], 2)
                        y = startY - 15 if startY - 15 > 15 else startY + 15
                        cv2.putText(frame, label, (startX, y),cv2.FONT_HERSHEY_SIMPLEX, 0.5,
COLORS[idx], 2)

        # show the output frame
        cv2.imshow("Frame", frame)
        key = cv2.waitKey(1) & 0xFF
        # if the `q` key was pressed, break from the loop
        if key == ord("q"):
                break
        # update the FPS counter
        # stop the timer and display FPS information
fps.stop()
print("[INFO] elapsed time: {:.2f}".format(fps.elapsed()))
print("[INFO] approx. FPS: {:.2f}".format(fps.fps()))
# do a bit of cleanup
cv2.destroyAllWindows()
vs.stop()
fps.update()
```