**YOLOv8 Object Detection with OpenCV Summary**

This code snippet demonstrates how to perform object detection using YOLOv8 (You Only Look Once version 8) along with OpenCV and the cvzone library. YOLO is a popular real-time object detection algorithm that can identify objects in images and videos.

Setup

1. Install the required packages using the following command:

python code:

pip install cvzone

2. Import necessary libraries:

python code:

from ultralytics import YOLO

import cv2

import cvzone

import math

import time

**Image Object Detection**

1. Load the pre-trained YOLOv8 model using the YOLO class from the ultralytics library:

python code:

model = YOLO("yolov8l.pt")

2. Perform object detection on an image named "traffic.jpg" and display the results:

python code:

results = model("traffic.jpg", show=True)

cv2.waitKey(0)

**YOLOv8 Object Detection with Webcam**

1. Capture video from the webcam using cv2.VideoCapture():

python code:

cap = cv2.VideoCapture(0) # For Webcam

cap.set(3, 720)

cap.set(4, 640)

2.Load the YOLOv8 model using the same approach as in the previous section.

3.Define a list of class names for object categories.

4.Initialize variables for frame rate calculation.

5. Enter a loop to process each frame from the webcam:

* Read a frame from the webcam using cap.read().
* Perform object detection using the YOLOv8 model:

python code:

results = model(img, stream=True)

* Iterate through the detected objects and draw bounding boxes and labels on the frame.
* Calculate and display the frame rate.
* Show the processed frame using cv2.imshow().
* Exit the loop if the 'q' key is pressed.

6. Release the webcam and close all windows when the loop ends.

**Summary:**

This code snippet showcases how to use YOLOv8 for object detection with OpenCV and cvzone. It covers both image object detection and real-time object detection using a webcam. The YOLOv8 model is used to identify various objects in the frame, and their corresponding bounding boxes and labels are displayed. Additionally, the code calculates and displays the frame rate to measure the performance of the object detection process. Finally, the script can be exited by pressing the 'q' key.