Name: Verdad, Jane Benneth Dione
Year & Section: BSCS IS 4B
Date: October 2024
Instructor: Sir Mark Bernardino

Object Detection and Recognition using YOLO

This project begins with the installation of the Ultralytics package, which includes the YOLOv8 model, that will be used in this real-time object detection project. By running (!pip install ultralytics), it ensures that all dependencies required for YOLO are available, allowing it to use its object detection capabilities. The installation confirms the presence of essential libraries such as NumPy, OpenCV, Torch, and others needed for processing and displaying detected objects.

Once the environment is set up, we load the pre-trained YOLOv8 model and specify two test images. A function, (analyze_performance), is created to perform object detection, measure inference time, and display the results. This function reads an image using OpenCV, performs object detection using the YOLO model, and calculates the inference time by measuring the time before and after model prediction. For each detected object, the function draws bounding boxes and displays the class name with confidence scores, providing a clear visualization of detected entities in the image.

In the output, the detected animals are labeled and highlighted in two separate images. “Image 1 Detection” shows the model identifying three elephants and three giraffes, with confidence scores provided for each detection. The inference time, detailed in milliseconds, reflects the model’s efficiency in identifying objects. “Image 2 Detection” identifies one elephant, two zebras, and four giraffes, again with detailed labels and confidence scores. The overall inference times and number of objects detected for each image are also displayed, showing YOLO’s ability to handle multiple objects with reasonable accuracy and speed.