

Short Report on the Results

This is a short discussion on the results. For the sake of simplicity, the comparison will be done using the first image of the dataset. Further results could be accessed using the codes provided.

1. C++ and Python comparison:

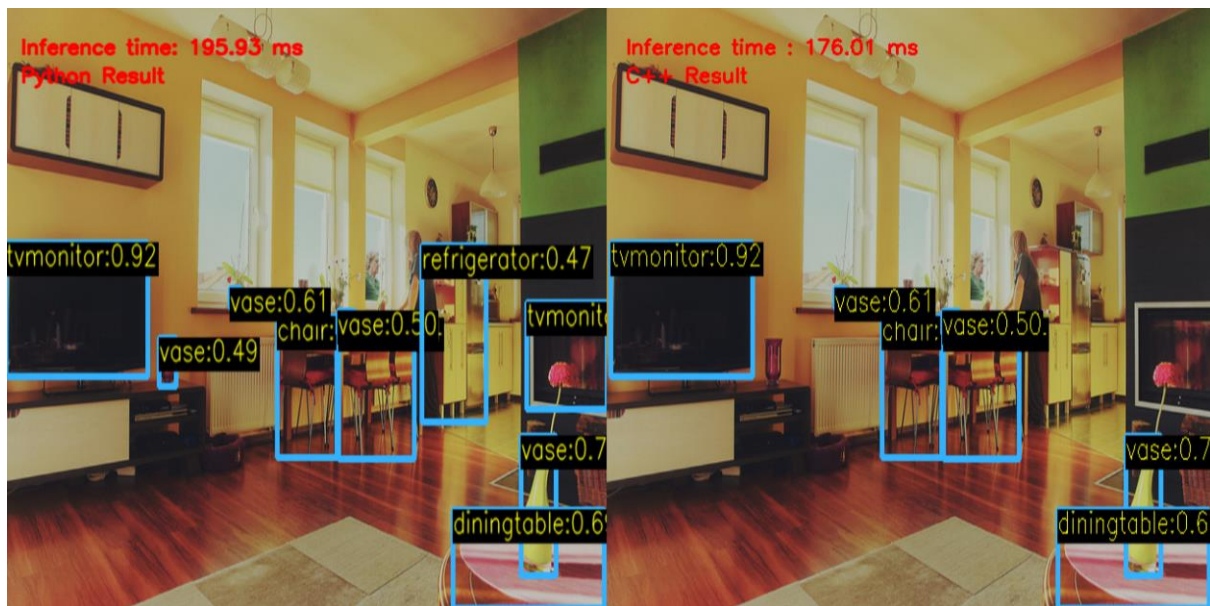


Figure 1: image1 for YOLOv5s model

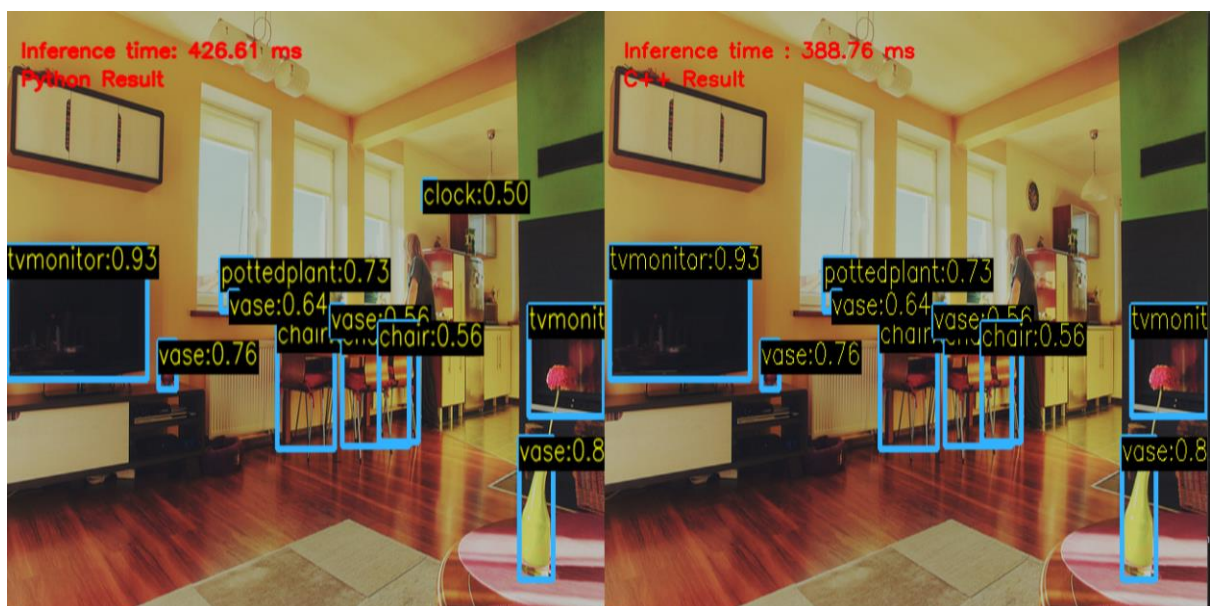


Figure 2: image1 for YOLOv5m model

Above, we could see the results for image one using YOLOv5s and YOLOv5m models. In the first image, the result of YOLOv5s model for image1 can be seen in python and C++ language. The comparison between python and C++ can also be seen in Figure 2 where YOLOv5m model is used. In both images, C++ appears to be approximately 10% faster than python. While for the first image the time difference is only 20ms, as the model gets more complex C++ can be seen to be 38ms faster than python. This leads to the conclusion that while there might not be a dramatic difference between C++ and python for the smaller models, the time difference becomes more crucial when the complexity of the model increases.

For some images such as image1, python has better object detection performance. This could be due to the smaller inference time allowing extra detection to be made.

2. YOLO5vn and YOLO5vm comparison



Figure 3: image1 for YOLOv5n and YOLOv5m

The result for image1 for YOLOv5m and YOLOv5n models can be seen on Figure 3. At first glance YOLOv5n model appears to be 332% faster than YOLOv5m. When the detection performances of both models are examined, we can observe YOLOv5m is able to identify more objects with higher confidence level. This comparison proves the trade-off between detection performance and inference speed. The graph of the average inference times over the first 20 images in the COCO dataset can be seen on Figure 4.

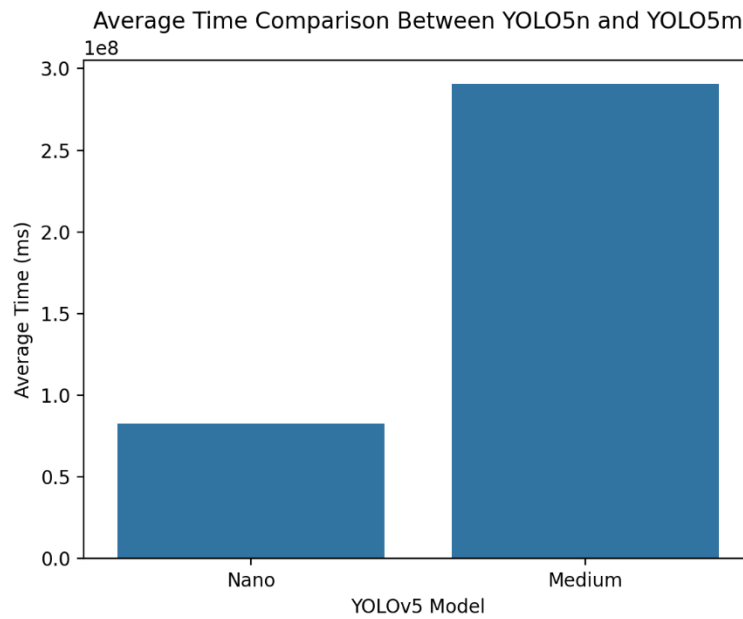


Figure 4: average time taken to process an image for YOLOv5n and YOLOv5m

3. Future Work:

The file 'conf_mat.py' includes confusion matrix, precision and recall calculations using frames and txt files in the 'data' folder. While the code is sufficient in producing the values, the results were not found to be reliable thus not mentioned in this report. Further work should be done to improve the results.