Alexandria Univeristy
Faculty of Engineering
Computer and Systems
Engineering Department

CSE: Computer Vision
Assigned: Sat, Dec 16, 2023
Due: Sat, Dec 30, 2023

Assignment 4

1 Object Detection

In this assignment, you will work on Cocco dataset which is a large-scale object detection, segmentation, and captioning dataset. You are required to run 3 different object detectors on this dataset. We will learn to use and differentiate between the architectures.
Either PyTorch or TensorFlow are allowed to run your models.

Figure 1: Dataset
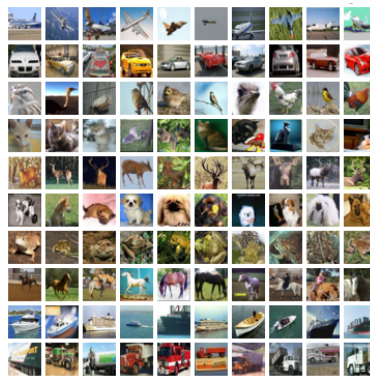
(a) Coco Dataset

1.1 Download Dataset

The dataset can be accessed and downloaded through this link: Coco. You can download any version of the data. Your choice of the version will depend mainly on your choice of the model. The model might be pretrained on a specific version.

1.2 Object Detection Models

In this stage you will run 3 different pretrained models on Coco testing set. Also choose another dataset and run your model on its testing or validation set. Consider diversity when choosing the three different models (Like one-stage and multi-stage models) to learn the difference among them.
There are multiple resources that can help you out to load pretrained models, like these links : TensorFlow 2 Detection Model Zoo ,TensorFlow Model Garden,Pytorch Pretrained Models ,TensorHub

Good Luck!

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1.3 Evaluate Models

In order to test your models. Evaluate it using: IOU "Intersection over union" and mAP "Mean Average Percision".
You are also required to identify some failure and success cases. Choose some cases from the test set which your model succeeded or failed to detect the objects. Think and analyze from these cases what is your model weaknesses or strengths.

1.4 Analysis

Provide a full comparison of the three different models. Studying the architecture of the model and the inference results will help you out. Please pay attention to this part, as it will have the most weight of this assignment.

2 Bonus

Choose any one of the following points

- Choose three different layers and show their feature maps.

- Written Report in latex.

3 Notes

You are required to deliver the following:

- Your code.

- Table for the inference results for both training and testing set.

- Comparison of the 3 different models.

- Output for test images.

- Report.

Good Luck!

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