2021 CSE 60625 Final Project Status Report I

Prepared by

Subhadyuti Sahoo

University of Notre Dame,

Notre Dame, IN, 46556

1   PROJECT GOAL AND MILESTONE

1.1   BRIEF EXPLANATION OF MY PROJECT

I wish to evaluate as to how far a GPU like NVIDIA GeForce RTX 3070 can be trusted to run deep learning algorithms on it and whether NVIDIA has been successful in fulfilling its promise of bringing cuDNN powered and GPU accelerated deep learning to the machine learning scientists, especially to those who cannot afford to spend a fortune behind setting up multiple GPUs with the limited budget they generally have. In brief, I want to carry out a study related to benchmark of NVIDIA GeForce RTX 3070 laptop GPU with state-of-the-art object detection systems such as DenseNet121, InceptionV3, MobileNetV2 and ResNet50.

1.2   MY MILESTONES

The following are my milestones for the final project:

- I plan to train 70% of all categories of images on DenseNet121, InceptionV3, MobileNetV2 and ResNet50 by using the newly-released Python library ImageAI

- I plan to evaluate the accuracy of these models on the validation dataset (30% of all the categories of images)

- I plan to plot the losses and accuracy scores of the training and validation datasets against the number of iterations (epochs)

- I plan to compare the accuracy scores of the manually-trained models against those of the pre-trained models (in other words, transfer learning)

- I plan to report the best model for each of the object detection systems

- I plan to evaluate and report the IoU for each of the models for each of the categories of images

2   TASKS COMPLETED SO FAR

2.1   COMPLETED TASKS

The following tasks have been completed so far:

- 70% of all categories of images have been trained on DenseNet121, InceptionV3, MobileNetV2 and ResNet50 by using ImageAI Python library

- The accuracy of these models on the validation dataset (30% of all the categories of images) have been evaluated

- Plots of the losses and accuracy scores of the training and validation datasets against the number of iterations (epochs) have been completed

2.2   ALIGNMENT OF MY PROGRESS

My progress so far is well aligned with the milestone I have set for my project. I am attaching herewith the notebooks, the MATLAB scripts and the plots.