**[DS5660 Fall 2023] Model and Machine Learning II**

**HW3(Seq28): DS5660\_HW3\_Train\_from\_Scratch**

## I. Purpose:

This assignment aims to perform a pretrained model with Pytorch implementation. A new dataset will be used. **All the code will be implemented in the notebook.** **Please finish this homework using Google Colab**.

* Learn how to do data augmentation in PyTorch.
* Learn how to define the pretrained model in PyTorch.
* Learn how to partially design the model in PyTorch.

II. Link of Data and Code:

[https://github.com/hrlblab/DS5660\_HW3\_Train\_from\_Scratch/tree/master](https://drive.google.com/drive/folders/14bdSznyeVxt-aENMG1SzTiTY1MB7CU6Y?usp=sharing)

## III. Description

Task : Start from scratch on model mobilenet v3 small

In this task, you will use the mobilenet v3 small model for the mnist dataset.

* Finish the data preparation. (detailed grading terms please see Grading and Submission)
  + Design your transformation function.
  + Load the images from folders.
* Design your model. (detailed grading terms please see Grading and Submission)
  + Define the pretrained model.
  + Modify the last block of the network.
  + Set up your criterion(loss) and optimizer.
* Train your model. (detailed grading terms please see Grading and Submission)
  + Run your training process and train your network.
  + Go through the ipynb and plot the loss and the accuracy.

## IV. Grading and Submission

* The assignment will be evaluated in a total of 100 points. The basic scores are generally given based on the following table.

|  |
| --- |
| Pretrained model mobilenet v3 small (100 points)   * Design your transformation function. (10’) * Get the feature number of the pretrained model. (10’) * Define the pretrained model. (20’) * modify the last block of the network. (20’) * Use optimizer to update parameters in your model (20’) * Get the prediction with one-iteration images.(10’) * Plot the losses and accuracy of train/val dataset. (10’) |

For each scale.

100% = perfectly correct

80% = minor flaw

60% = mostly incorrect

40% = totally incorrect

20% = do something

0=not do anything

* The assignment should be submitted s:
  + 1. A single PDF report file should be submitted to Brightspace with last name and VUID (e.g., “Huo\_huoy1.pdf”). The ideal PDF report file is a printed Colab ipynb file with required results embedded.
    2. All source code should be submitted to Brightspace as a single zip file with last name and VUID (e.g., “Huo\_huoy1.zip”).
* The deadline of submission is on the course website: <https://hrlblab.github.io/DS5660.html>