CSC 417/617/717 Deep Learning in Computer Vision (Fall 2024)

Assignment #1, Deep Neural Nets on Fashion MNIST

Due: 2 pm, Sep. 12th

Preparation: Download the Jupyter Notebook file available on Canvas (Files >> 2_Code >> HW1_NeuralNets_FashionMNIST.ipynb). If you don't have experience with Google Colab, go through a manual (Files >> 0_LectureNotes >> Suppl_ComputationalTools.pdf).

This assignment is designed for you to get familiar with training techniques for deep neural nets using TensorFlow. We use Fashion MNIST as the training and testing datasets. Since the datasets are already included in TensorFlow, you do not have to download them.

Following problems are given to ALL students. Start with the given .ipynb file and apply the steps 1-3 below. Although you may run the whole code at every step, you only need to submit a source code file after completing all the three steps.

Step 1. Activation Function

Change the original code so that it can use Relu as an activation function.

Reference: https://keras.io/api/layers/activations/

Step 2. Weight Initialization

Change the code from Step 1 so that it can use He Normal initialization.

Reference: https://keras.io/api/layers/initializers/

Step 3. Deeper Architecture

Change the code from Step 2 so that it can have 2 hidden layers each with 512 neurons (units).

Submission: Submit a **single** Jupyter Notebook file via CANVAS. Use *Yourname_HW1.ipynb* as your submission filename.

NOTE: Make sure that you submit your code with all results **displayed** (otherwise 25% of your points will be deducted).