CEE 494/501 Homework #5 –Convolutional Neural Networks

Note: 1. Submission of homework must be electronic. Problems require you to write computer programs. Please submit a Jupyter notebook that contains the output.

In this exercise we will work with image data: specifically, traffic sign dataset - German Traffic Sign Recognition Dataset (GTSRB). It contains 43 categories of traffic signs like STOP, Speed limit etc. The training set contains 39209 labeled images and the test set contains 12630 images. Images are colored and have different resolutions. Hence, we will have to resize all of them to the same size of 32 X 32. Note that data is in. mat format. You need to look for a way to load it.

Problem 1: Build a neural network with the given dataset.

Problem 2: Build a Convolutional neural network (CNN) with the given dataset.

Submission:

1. For each problem, plot a graph of cross entropy loss and accuracy with respect to the number of epochs.

2. Mention which neural network performs the best and why?