SS21 MTH994 HW1

February 4, 2021

Submission

- Due date: 6:00 PM, Feb 18, 2021.
- Please upload your homework to D2L

Problem 1 – ANN (50pts)

The MNIST datasets are given: MNIST_X_train.csv (features), MNIST_y_train.csv (labels), MNIST_X_test.csv (features) and MNIST_y_test.csv (labels).

1. Please program an Artificial Neural Network (ANN) with two hidden layers.

2. Please tune the hyper-parameters and print the test accuracy of your model.

Problem 2 – CNN (50pts)

The MNIST datasets are given: MNIST_X_train.csv (features), MNIST_y_train.csv (labels), MNIST_X_test.csv (features) and MNIST_y_test.csv (labels).

1. Please use Pytorch to program a CNN with 2 convolution layers and 2 pooling layers. Note:

   - The 1st convolution layer with kernel size: (1, filters1, 5, 5), strides = 1, padding = 0.

   - The 2nd convolution layer with kernel size: (filter1, filter2, 3, 3), strides = 1, padding = 0.

   - Pooling size is (2,2), and the stride size of pooling layer is always 2.

2. Please tune the hyper-parameters and print the test accuracy of your model.