

SIG720 Task 3C

Solve the following set of problems using Python and submit the code file with extension .ipynb.

1. Load the [MINIST Digit dataset](#), show the size of the training and test set.
2. Develop a one hidden layer multi-layer perceptron model on the above training data, report the accuracy of the model.
3. From question 2, set the number of hidden layers of the MLP model as [2,4,6,8,10], set the hidden layer size as 100, show the accuracies on the test set.
4. From question 2, for the hidden layer set the hidden layer size as [50, 100, 150, 200], show the accuracies on the test set.
5. Based on question 3 and 4, explain the key findings.
6. As the deep neural network size is increased, [double descent](#) refers to the phenomenon in which the model performance initially improves, then gets worse, and ultimately improves again. Create two-layer fully connected neural networks, increase the network size by setting bigger hidden layer sizes, reproduce the double descent risk curve with the above MINIST dataset.