MTRE4300 Machine Learning for Robot Perception

Project #9

Due by 11:59 pm on 05/03/21 (Monday)

In this project, you are required to develop a Python program to train a support vector machine (SVM) classifier on the MNIST dataset.

In particular, the project requirements are below:

1. In the first line of your Python code, use a comment line to show all group members' names.
2. The MNIST database contains 60,000 training images and 10,000 testing images. You first use the 60,000 training images to train your SVM classifier and then use the 10,000 images to test it.
3. Each image in the MNIST dataset is a 28x28 b/w image. You first need to expand the image into a 1-D vector with 784 elements, which is a support vector.
4. You are supposed to use a nonlinear 'rbf' kernel to classify the images
5. Display the training accuracy and test accuracy.
6. Each group saves your Python code as "SVM_MNIST.py" and uploads it to the D2L drop box.
7. Each group writes a short report with free format to summarize your results and findings and uploads it to the D2L drop box.

Grading Rubric

- 20 points: The Python code is submitted correctly.
- 30 points: The code runs without any syntax errors.
- 10 points: The MNIST dataset is loaded and used correctly in the Python code.
- 10 points: The SVM model is created, trained and tested with MNIST dataset in the Python code.
- 20 point: The training and test accuracy of your SVM classifier are both above 80%
- 10 points: A short report is submitted to summarize your results and findings.