Project Description

You have to develop a Jupyter Notebook that performs the following tasks:

1- Download one of the Datasets (CIFAR-10, CIFAR100, MNIST, etc.) and split it to train and test datasets using dataloaders.

2- Create your neural network (3 convolutional layers and 3 fully connecting Linear Layers with maxpooling, stride=1 and padding up to your choice) for classification application.

3- Train the neural network using the training dataset

4- Test the network on the testing dataset for 5 epochs

5- Determine the accuracy

6- Modify the learning rate to 0.01, retrain and test and re-compute the accuracy. Discuss the obtained result compared to previous.

7- Modify your neural network by changing the stride=4 in the first convolution layer. Train (using learning rate of 0.001) and test the network again. Obtain the accuracy, compare and discuss the results.

8- Now, apply data augmentation (random horizontal flip, random vertical flip and random crop) to the training dataset. Train the original neural network using learning rate of 0.001 and 0.01 respectively. Test the new trained neural network and obtain the accuracy. Compare and discuss the results.

Notes:

- The project should be done in groups of 2 students.
- You have to show the Jupyter Notebook and execute it during the presentation
- You should be ready for any question concerning the developed codes and obtained results
- You have to save all trained models as you will be asked to load them on site and apply testing.