Programming Assignment-IV

Computer Vision

Coding Standard and General Requirements

Code for all programming assignments should be **well documented**. A working program with no comments will receive **only partial credit**. Documentation entails writing a description of each function/method, class/structure, as well as comments throughout the code to explain the program flow. Preferred programming language for the assignment is **Python** with PyTorch framework for deep learning. You are free to use any other programming language and framework as well.

Submit by **Nov 17, 2023**, 11.59pm. There will be strictly no extension to this deadline.

Question 1: Image Classification [5 pts]

This is an extension of problem 2 from programming assignment 1. In this question your goal is to develop a CNN classification network to recognize RGB color images. You will design your own variants of CNN architecture which should have more than 2 convolutional layers and more than 1 fully connected layers. You will use CIFAR-10 dataset which is available from PyTorch (torchvision.datasets.CIFAR10).

Your tasks:

- Design a CNN architecture which has more than 2 conv layers and more than 1 fully connected layers. It should make 10 predictions for the 10 classes of CIFAR-10. Train this network on CIFAR-10 for 30 epochs using cross-entropy loss and SGD optimizer. Report training/testing loss for each epoch in form of plots and accuracy scores after 30 epochs. Remember you will need a softmax activation after the final fully connected layer.
- Increase the number of conv layers in the above network and train again. Report the same numbers and plots again comparing with the first network.

NOTE: You can use the code provided as a solution for programming assignment 1 and extend it.

What to submit:

- Code
- A short write-up about your implementation with results: 1) Accuracy scores for all the variations, 2) Compare all the variations using accuracy scores. Comment of how the accuracy changes when you increase the number of conv layers.