Lab 7 - Optimizers and Loss Functions

Computer Vision (10224)

Goals

- Learn about different Optimizers.
- Learn about different type of loss functions.
- Train a Model!

Preparatory report

1. Read about the following optimizers and write down what you understood:

   - Adam
   - SGD
   - AdamW

2. Implement the following optimizers using pytorch (You may use Pytorch or other Github implmentations).

3. Read about the following losses and write down what you understood:

   - Binary Cross Entropy with logits loss (BCEwithLogitsLoss)
   - Cross Entropy
   - Focal Loss
   - Dice

4. Implement the Focal Loss function, you may not used online/git implementations.

Lab Session

1. Train LeNet on the MNIST data (10 digits) show accuracy and loss graphs on both validation and train data. Your accuracy results on train and validation should be > 90%

Final Report

1. Train and run validation on LeNet model using the data you prepared in the previous lab sessions (MNIST 100 digits). Try obtaining atleast 70% Accuracy on the validation set.

2. Show accuracy and loss graphs on the train and validation sets.
3. Write a short TL;DR and explain your results.