

Computer Vision (CSE/ECE 578)
Spring-2020
Assignment-4 (Image Segmentation using CNN)
Posted on: 6 April 2020
Due on: 11 April 2020

Instructions:

- The assignment aims to familiarize you with the basic training of CNNs and different loss function.
- **Make sure that the assignment that you submit is your own work. Any breach of this rule could result in serious actions including a W grade in the course.**
- We recommend you to start your work early and do not wait till the deadline.
- Make sure your files can be opened. Corrupted files will not be entertained.
- **You can use Tensorflow or PyTorch for this. However, you are expected to implement it yourselves and not use an existing implementation.**
- The dataset is kept small to facilitate training on CPU. Students would not require GPU for this assignment.
- Download the train/validation dataset from this link.

Tasks:

Object Detection

1. Train a convolutional neural network with 3-4 layer depth for identifying different objects in the image.
2. Predict the object category and the bounding box of the object.
3. Show results on 3 different loss functions or ideas discussed in the class. You can use a combination of classification and localization loss with different weights.
4. Experiment with different combinations of convolution, batch norm, pooling and activation layers. Try varying learning rates and weight decay hyperparameters as well.
5. Report your results on the test data of the PASCAL VOC 2007 challenge. The test dataset can be downloaded from this link.
6. Use the evaluation metrics and scripts given here.

Instructions

- Write modular code, with comments clearly outlining the function of each module.
- The code must be robust and scalable i.e, it should work for a larger dataset with similar input structure.
- Add the code to the report as well and explain it wherever necessary.
- Make sure you provide the code separately also and not just in the report.
- Try to explain the different loss functions in the report.
- Please ensure that the report contains your roll number. Zip the code and report for submission. The zip file should be named RollNumber_Assignment4.zip .