Computer Vision: Lab 4 – ANPR and Introduction to PyTorch

Prerequisites: Python basics, numpy, pandas, matplotlib, OpenCV, etc.

Task 1:

For this task, you need to segment out the number plates from car images, using the traditional vision techniques like filtering, edge detection, contours etc. You do not have to use any ANPR libraries (like easyocr) or deep neural networks for segmentation. This is solely an image processing task. You may use some spatial context to segment out the license plates. The annotation files may be used to determine the accuracy of your segments by using Intersection over Union (IoU) evaluation.

Dataset Link: https://www.kaggle.com/datasets/dataclusterlabs/indian-number-plates-dataset

Task 2:

Go through the tutorial at the PyTorch site, the link for which is given below, and then carry out the given tasks:

Link: https://pytorch.org/tutorials/beginner/basics/intro.html

Basics of Tensors: https://pytorch.org/tutorials/beginner/basics/tensorqs_tutorial.html

1. Replicate the code from the above link and understand how the following are implemented in PyTorch. The implementation is to be done for the MNIST dataset (not the given FashionMNIST) dataaset:

    a. Dataset inputs

    b. DataLoaders

    c. Model creation

    d. Training loop with loss function / Training on a GPU

    e. Optimizer and tracking the loss value.

    f. Saving the model to disk and loading a pretrained weights.

    g. Validation on the unseen data.