CENG 506 – Deep Learning
Homework 2

17 May 2021

Due Date (for 100% mark): 31 May 2021
Late Due Date (for 75% mark): 03 June 2021

Exercise 1 Autoencoding GIMS08

Download the EPFL GIMS08 dataset and extract it to a folder of your choice. Download the file `epfl_gims08_dataset.py` from Teams that implements a pytorch `Dataset` to load the dataset. Implement the AutoEncoder class whose architecture is given by the lecture slides of Section 7.2. Perform the following experiments and report results as indicated

- Train an autoencoder on the training set from a single car sequence and test it on the test set of the same sequence. Report the best MSE loss you can obtain for each sequence individually. Comment on the difficulty of the sequences and explain why some might be easier than others. Show decoder outputs from eight test samples.
- Train an autoencoder on the training sets for sequences 1–10 and test it on the test set of the sequences from 15–19 using the test subset for the sequences 11–14 as the validation set. Report the best MSE loss you can obtain. Show decoder outputs from eight test samples from each sequence in 15–19.
- For a sequence of your choice demonstrate interpolation between two car images in the pixel domain and the AutoEncoder latent domain using the AutoEncoder trained on the same sequence picking the interpolated samples from the test set of the same sequence.