Deep Learning **(Due: 30/04/20)**

Assignment 2

Instructor: Siamak Mehrkanoon

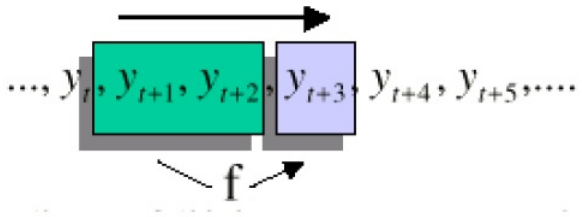
Assignment Policy: Read all the instructions below carefully before you start working on the assignment, and before you make a submission.

- Please include your names and student IDs with your submission.
- You can do this assignment in groups of 2 or 3. Please submit no more than one submission per group.
- You have one week to work on the assignment.
- Please submit a short description of what you have done. including used methods, results, discussion, conclusion and references. The report should not exceed 4 pages. Please also submit the your code along with your Short description. Put both of them in a zip file named "*yournames_assignment*1.*zip*", e.g. "*Alex_Julia_assignment*1.*zip*".
- In order to give everyone the same amount of time, late submissions are not allowed unfortunately. Unless it is discussed in advance.

1 Dataset and Task

You are given a real-life dataset of a laser measurement. You can find the training samples it in the *Xtrain.mat* file. The test samples will be provided in the EleUM on 30th.

(a) Select your choice of neural networks model that is suitable for this task. Train your model to predict one step ahead data point, during training (see following Figure). Scale your data before training and scale them back to be able to compare your predictions with real measurements.



(b) How many previous time steps you want to feed in to your network to give you the best possible answer you can obtain by your model? (Hint: Tune it)!

(c) After the training your model is done, ask your model to predict the next 200 points in a recursive fashion. (Your model should run in a recursive fashion, meaning that the prediction should be send back and used for up-comping ahead predictions.)

(d) Downloading the real test dataset on 30th April and report the obtained mean absolute error between your test predictions and real test data. In addition, plot your prediction an real prediction of the test data to visually compare the performance of your model.

(e) Just: Good Luck and Enjoy Learning!