

CSCI 7000: Applied Deep Learning

Homework 2

Goals: Apply deep-learning techniques to time-series data

Deliverable: Jupyter Notebook performing and explaining a deep neural network for a simple classification or generation task.

Due date: Sunday, March 8, 6pm.

Description

So far, you have learned about a variety of network architectures for encoding and classifying static data, which reach their limitations as soon as the network would need to maintain state. So-called recurrent neural networks can solve this problem, in particular simple RNNs, LSTMs and GRUs. The goal of this homework is to apply these tools to a standard online dataset. (The dataset has to be available online.) Develop an iPython/Jupyter notebook that walks the user to the entire process from loading the data, visualizing it, defining a suitable neural network, optimize hyperparameters, and showing the results. One possible source of data is the UCI Machine Learning repository <https://archive.ics.uci.edu/ml/index.php>

The data has to have a temporal component, that is it has been generated from some kind of process and ordering of the data matters. Please make sure that you not only present one possible network architecture, but that you illustrate how you have found the optimal hyper parameters, for example by comparing different architectures / parameters and/or systematic search.

Submission

In order to submit the homework, pull the deep learning repository on github (<https://github.com/correll/deep-learning.git>), place your file with a meaningful name, such as the name of the dataset you chose into the directory “examples/dynamic_problems” and create a pull request. The date of your pull request will be counting as submission.