

Bachelor's / Master's Thesis

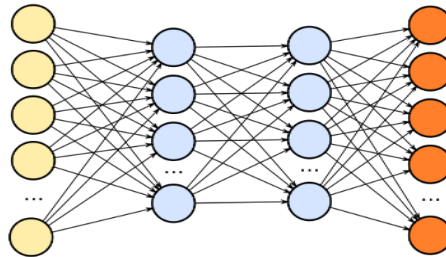
A Novel Methodology for Flexible Short- and Long-Term Energy Load Forecasting Combining Unsupervised Learning and Deep Learning in Context of Big Data

Every year, energy consumption grows widely. Such growth increases the need for better planning of energy usage. Energy load forecasting has received an increased attention based on the fact that an intelligent decision making requires an accurate prediction of future energy load/demand.

As known, energy load forecasting is a time series regression problem. It is solved by predicting the energy load for a coming specific period given a finite history of energy load.

In this thesis, the powerful of deep learning methods e.g. Convolutional Neural Network (CNN) will be combined with unsupervised machine learning algorithms to achieve more flexible accurate prediction of short- and long-term energy load in context of big data environment.

State-of-the-arts deep learning frameworks such as TensorFlow will be used to build the forecasting models. The prototypical implementation of those models can foster existing technologies, e.g. Jupyter notebook running on underlying Big Data cluster. To that end, a powerful big data environment including Hadoop, Apache Spark will be available to achieve the best performance.



Tasks:

- Factor Analysis and Data Preprocessing
- Development of short-term and long-term Energy Load forecasting models using deep learning
- Evaluate the performance of the proposed models

Requirements:

- Student of computer science, electrical engineering, mechanical engineering or related disciplines
- General interest in application of data analysis, deep learning and Big Data
- Good programming skills in Python and Java
- Thesis can be written in English or German language

