UNIVERSITÄT DUISBURG ESSEN

Offen im Denken

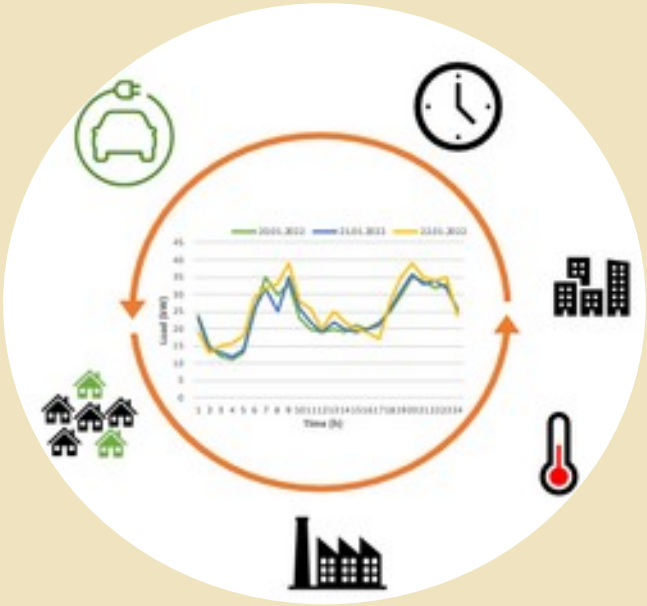
Fachgebiet für Elektrische Energiesysteme (EES)

Electric load forecasting for demand flexibility in smart grids using machine learning techniques

The goal of smart grids is to create automated and efficient energy distribution systems that improve the reliability and quality of power supply, while also addressing network security, promoting energy efficiency and incorporating demand-side management. To ensure efficiency in smart grids, demand-side management is required, and electric load forecasting plays a vital role in demand-side management. Especially, accurate short-term load forecasting is critical to the day-to-day operation of a smart grid.

There are many factors that influence the consumption profile, i.e. the amount of electricity used, such as the price of electricity, time of day, type of user, weather conditions, etc. Electric load forecasts should be made by evaluating these factors for high accuracy because the results have a huge impact on demand flexibility. The aim of this thesis is to make short term electrical load forecasting fast and accurate by using appropriate machine learning techniques to improve network management, minumum congestion and ultimately avoid costly investments in network reinforcement.

The work has to start with an analysis of used techniques for short term load forecasting. Based on this suitable machine learning methods have to be evaluated, chosen, implemented in Python and in the end trained and tested on real consumption data.



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