



Master Thesis

Literature research, Programming and Simulation

Machine learning based modeling of general energy consumers behaviors in industrial sector

Keywords: Energy consumption, renewable energies, community

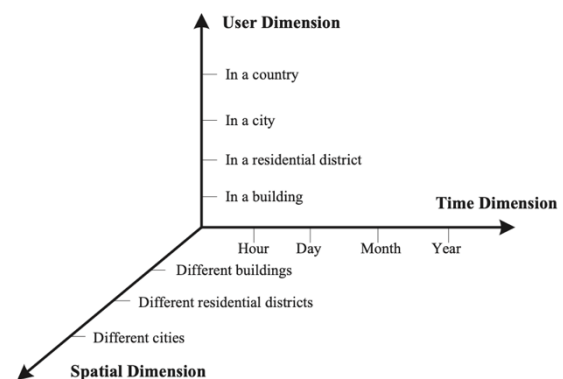
Conditions:

Duration: 6 months
Requirements: Strong MATLAB knowledge
Language: English
Target group: Master students

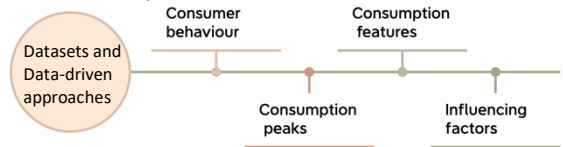
Contents:

In recent years, there has been a growing global interest in renewable energy resources such as solar and wind. This interest is driven by concerns about climate change, air pollution, energy security, and the desire for sustainable and clean energy alternatives. Because of this, an increasing focus appeared for understanding how consumers make decisions related to renewable energy consumption, and the factors influencing consumers choices.

In this work, the primary objective is to employ simulations-based methods to develop models that represent industrial consumers available in cities. These models simulate how these consumers make decisions regarding their energy consumption through the time. The goal is to develop generalizable models by addressing the key factors that influence industrial consumers within the city, which may include economic considerations, industrial processes, weather conditions, and others. The focus to solve the mentioned problem in this work will be by using machine learning approaches. The student must pass the Machine Learning exam (by Prof. Söffker).



Different dimensions of household energy consumption behavior. [Zhou et al., 2016]



The goals/steps of this work are:

- Based on literature review: Defining the different existing research, theories, and models related to general industrial energy consumption behavior in a city
 - Based on literature review: Refining the different types and features for industrial energy consumers in a city
 - Determining data requirements for the simulation (may include data on renewable energies, energy loads, industrial processes, energy prices, and market dynamics.)
 - Generating methods and models using machine learning to address the problem
 - Simulation and comparison of the methods using MATLAB/Simulink
 - Evaluation and validation of the developed methods using real datasets
- Complete and detailed documentation/presentation of the research results

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