

Occupancy detection with smart meter data

Motivation

The roll-out of smart meters in Europe is well advanced. Smart meters allow to measure the electricity consumption of households, typically every 15 minutes and allow utilities to improve billing processes or use the data for load forecasting. Still, both, industry and households can benefit from further applications like the detection of the occupancy state of residents of a home, e.g. by using this information for burglary alarms or estimate the base load consumption of a household.

Task

The student is provided a dataset with anonymized smart meter data and holiday times of households and should use several data analytical methods such as machine learning techniques to identify whether a household is occupied. In addition some of the following constructs should be tested: transferability of learned models to other households, the influence of data granularity (e.g. 15-min vs. 1-hour), or other constructs to be defined together with the student.

Expected results

Students are expected to (i) preprocess the data, (ii) apply data analytical techniques, (iii) compare several approaches (iv) discuss the findings.

Title English

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Level: Bachelor thesis

Methodology

Data analytics

Special prerequisites

statistical software R

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