

Clustering of Electricity Customers based on Load Characteristics

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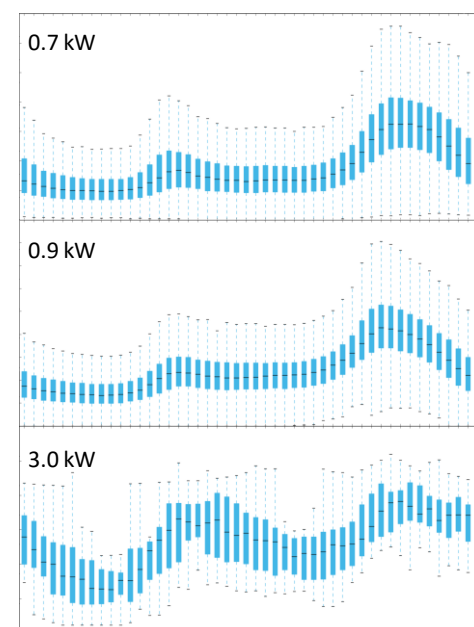
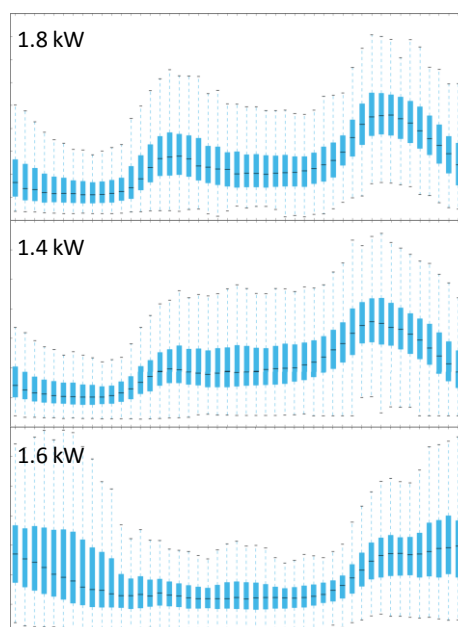
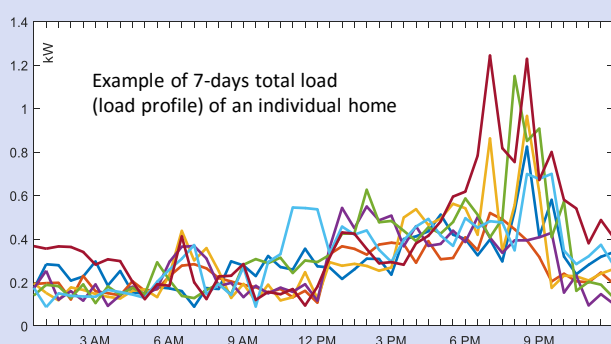


Objective: To better understand the patterns of residential electricity load behaviours, it is often useful to group similarly behaving homes together.

- Load variability increases with number of homes and number of days :



- Clustering can reduce annual profiles of thousands or millions of homes down to several diurnal profiles :

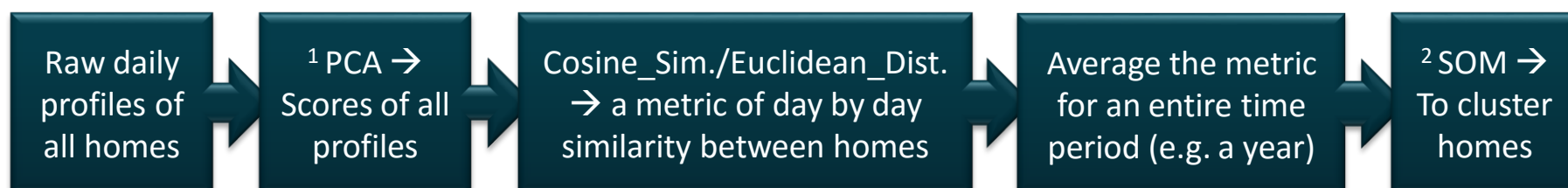


48 Half-hours

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Time domain clustering approaches

Feature-based



- Captures key time features well, including both shape and magnitude features of load profiles
- Can be made sensitive to shape features only, i.e. removed mean (or magnitude of load profiles)
- Downside is inputs are limited to equal, synchronised and clean time series

Model-based



- Captures time series dynamics, and therefore supports time series forecasting, and context scenario projection
- Handles unequal time series with different extent, and therefore applicable to wide range of datasets in the industry
- High clustering robustness against noise (e.g. Gaussian) as noise impact is cancelled out throughout the series
- Downside is the limit to mainly shape features as magnitude feature is not captured well in mapping

¹ PCA: Principal Component Analysis , ² SOM: Self-Organising Map , ³ DCE: Delay Coordinate Embedding

FOR FURTHER INFORMATION

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