

# Propositions

accompanying the dissertation

## SINGULAR VALUE DECOMPOSITION FOR TIME SERIES ANALYSIS WITH APPLICATIONS TO SMART ENERGY SYSTEMS

by

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1. The SVD does not solely depend on the shape of the point cloud, but also on the position of the cloud with respect to the origin. In SVD analysis we must take that into account. **(this thesis)**
2. Matrix factorisation techniques offer alternative analysis tools that are better suited than more conventional methods, to visualize and incorporate the intra-day and inter-day variability of the energy data. **(this thesis)**
3. The decision to stimulate RES-generation has had a noticeable impact on the day-ahead electricity market in Germany in the years 2006-2016. **(this thesis)**
4. SVD is a pivotal and non-trivial technique in linear algebra. However, in two dimensions, there is an easy continuity-based argument that shows why the SVD theorem holds. **(this thesis)**
5. The goal of data mining and machine learning is to construct and exploit the intrinsic low-rank feature space of a given data set.
6. There is a narrow line between enhancing user experience and exploiting user's data in the market.
7. In-depth understanding of mathematical tools is paramount for the ability to obtain a correct perspective on complex problems at hand. Without this underlying understanding, despite the existence of many alternative tools, we can never realize the true potential and meaning of the results.
8. In different aspects of data analytics, finding the right metrics to evaluate the model is as important as finding the right decision variables.
9. While a thesis condenses the key, most relevant findings, along the way to those findings there is always a very substantial effort, approaches and dead-ends that never see the light of the day.
10. Regular and on-site collaboration with companies (as project partners) can be beneficial for PhD students to expand their networks and gain more experience with the most recent tools used in the industry.

These propositions are regarded as opposable and defensible, and have been approved as such by the promotor Prof. dr. Han La Poutré and copromotor Dr. Eric J. Pauwels.