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## Unsupervised representation learning for time series anomaly detection and beyond

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# Stellingen

Behorende bij het proefschrift

## Unsupervised Representation Learning for Time Series Anomaly Detection and Beyond

1. While datasets generated with simulation models can never achieve the same complexity as those from the real world, they can be extended to arbitrary complexity where a possible discrepancy no longer matters. (Chapter 4)
2. An unsupervised threshold based on contaminated and unlabelled data makes the task of reliably detecting anomalies much more difficult. (Chapter 5)
3. Even a domain expert who is wrong 30 % of the time can turn an anomaly detector that detects 2 % of the anomalies into one that detects 64 %. (Chapter 6)
4. Data-driven modelling of real-world systems is a promising solution for applications that require the separation of behaviour of interest from everything else. (Chapter 7)
5. If evaluation metrics lack intuition, they become difficult to interpret and lose meaning to the user.
6. Strictly speaking, no anomaly detector can be truly unsupervised unless it features zero hyperparameters.
7. The labelling process for an anomaly can be skewed, depending on whether one considers or is aware of the underlying mechanism causing the anomaly.
8. Without widely-accepted benchmarking procedures that evolve with time and contributions, time series anomaly detection will remain a minor research area without major advances.
9. Quantifying the quality of solutions is easy with metrics, but quantifying the quality of metrics is not.
10. Progress is built by continuing to try after outcomes fall short of expectations.

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