

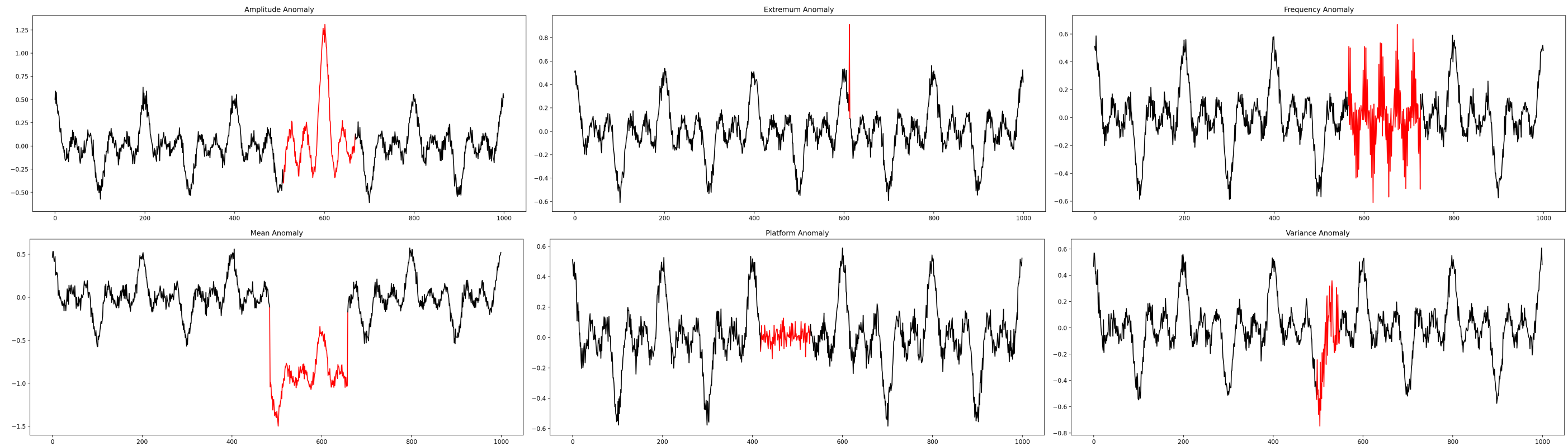
AnoScout

Visual Exploration of Anomalies and Anomaly Detection Algorithm Ensembles in Time Series Data

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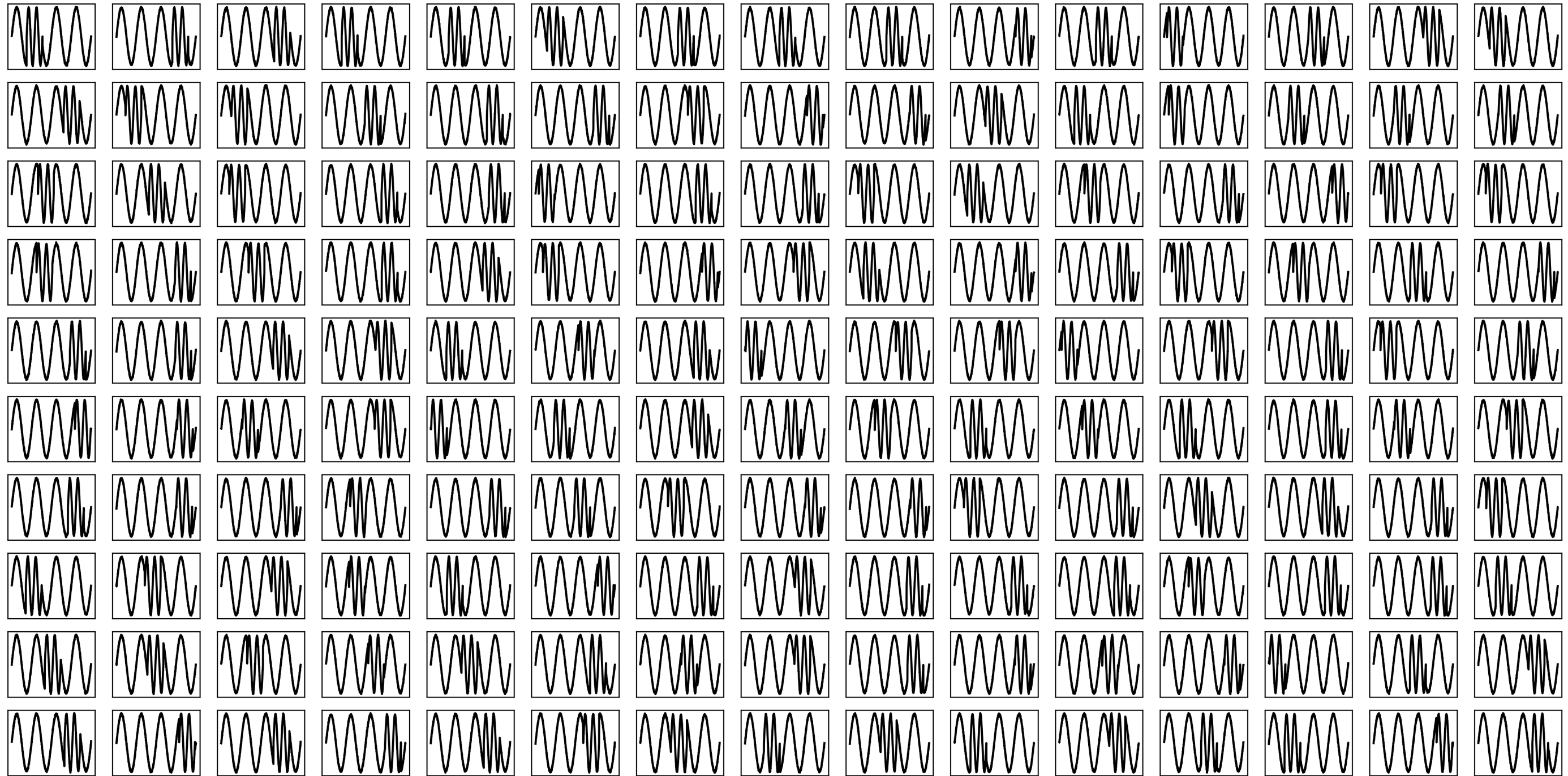
VINCI 2025 - 01.12.2025

Anomalies in time series (Selection)



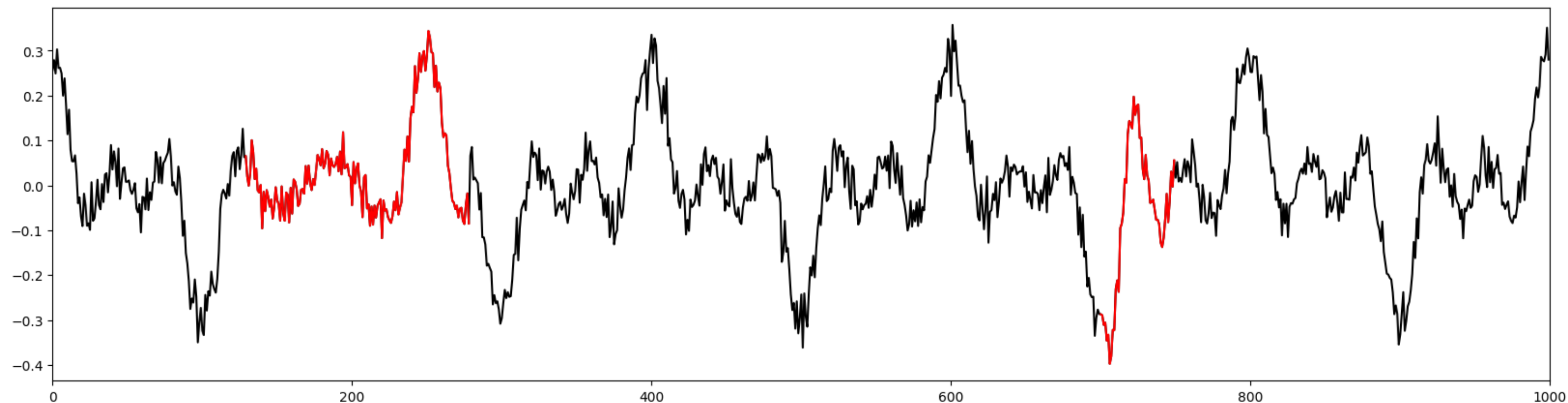
Anomaly = Unexpected Pattern

Check every time series by hand?



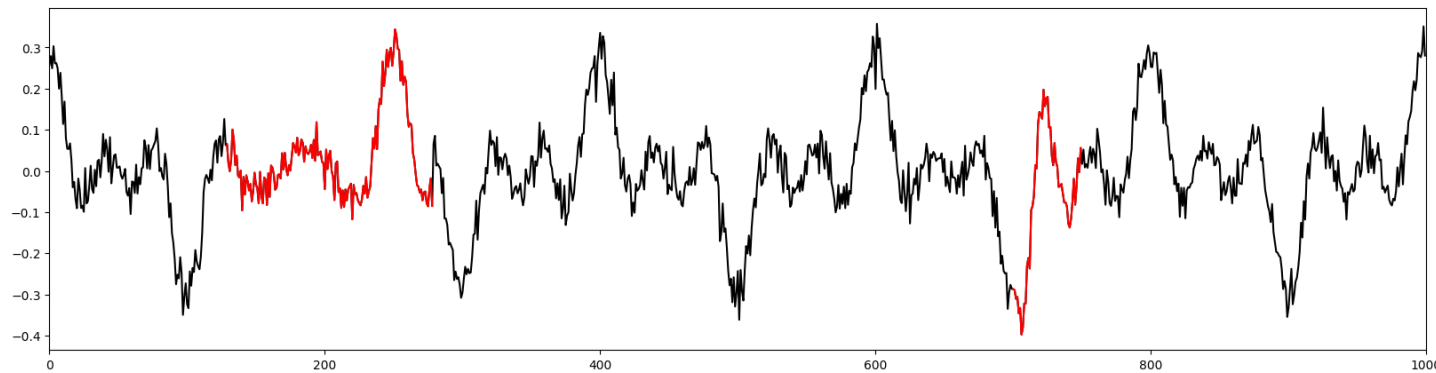
Let algorithms do the work!

We would like to find these anomalies:

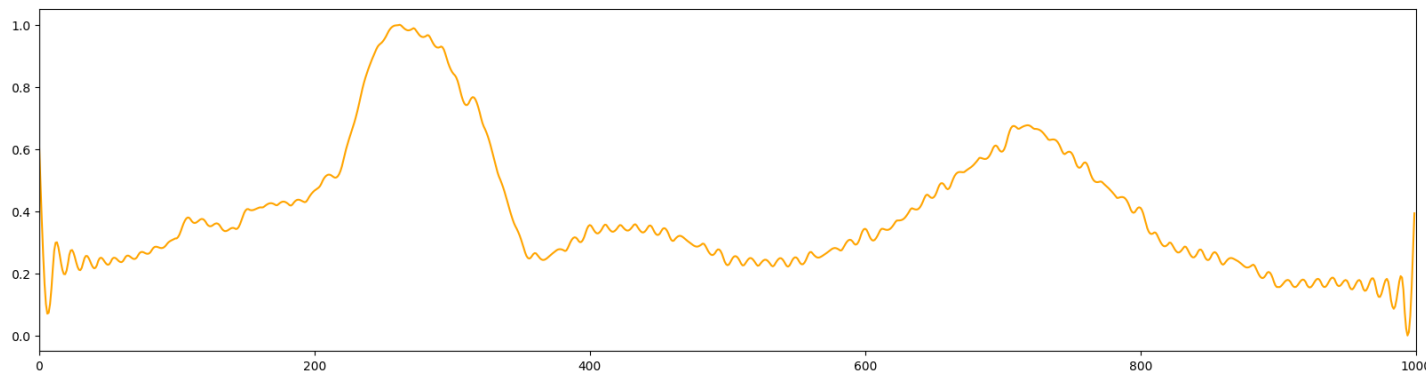


Apply unsupervised algorithms = no training required

Unsupervised algorithms produce a scoring

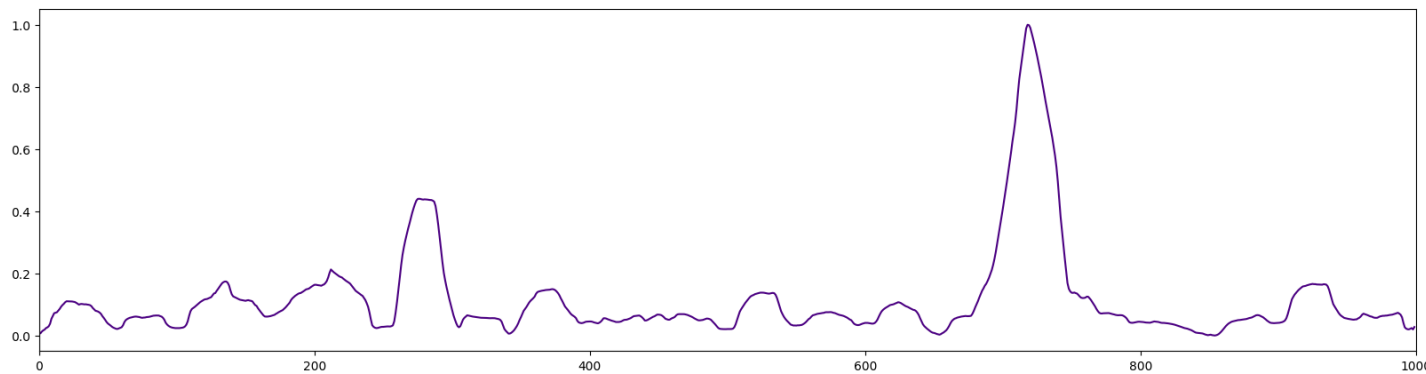


Input Time Series



K-Means

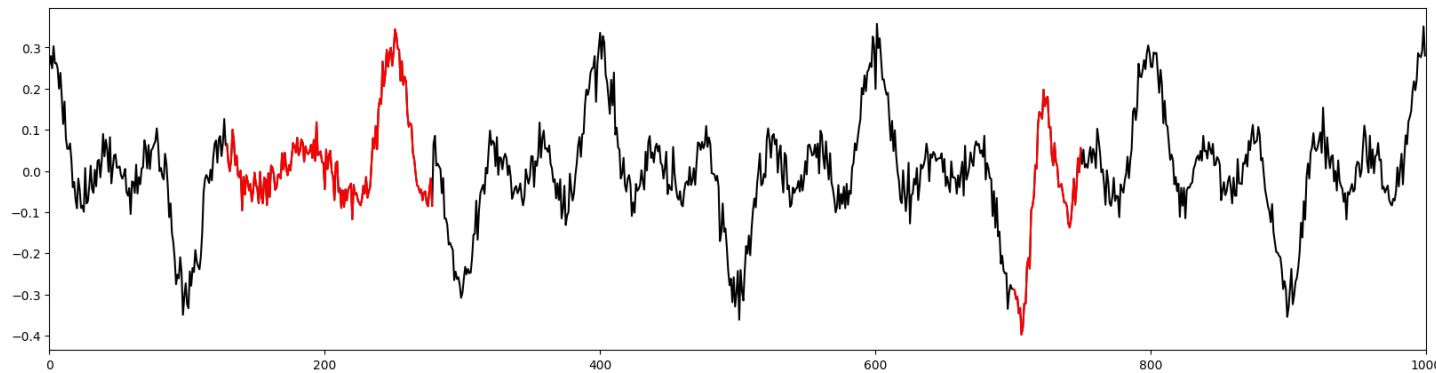
Better for first anomaly



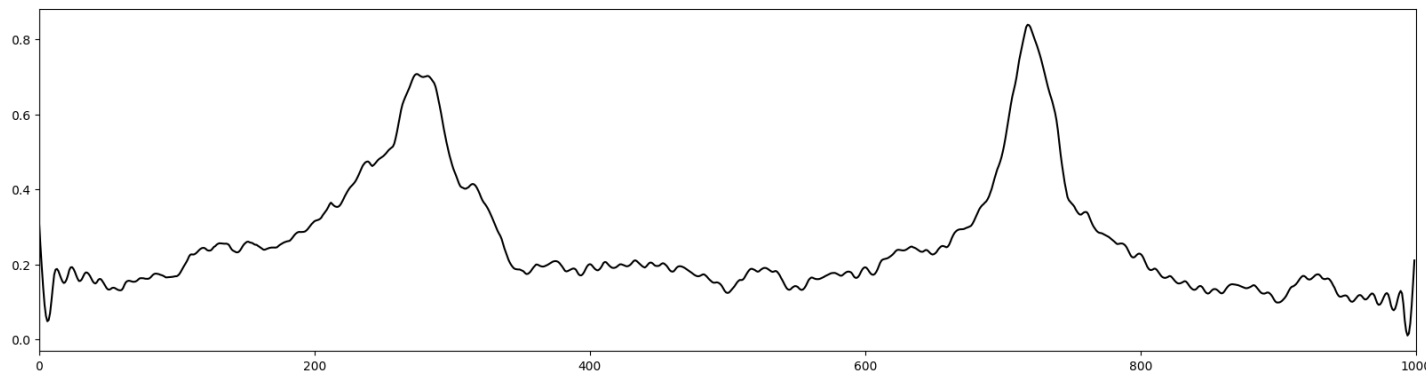
Local Outlier Factor

Better for second anomaly

Ensemble to combine strengths

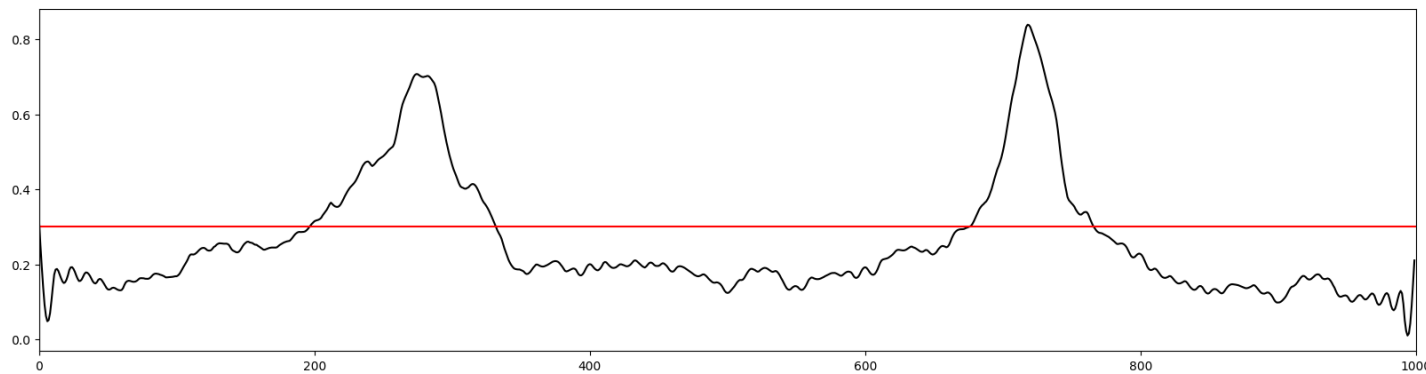


Input Time Series



Ensemble

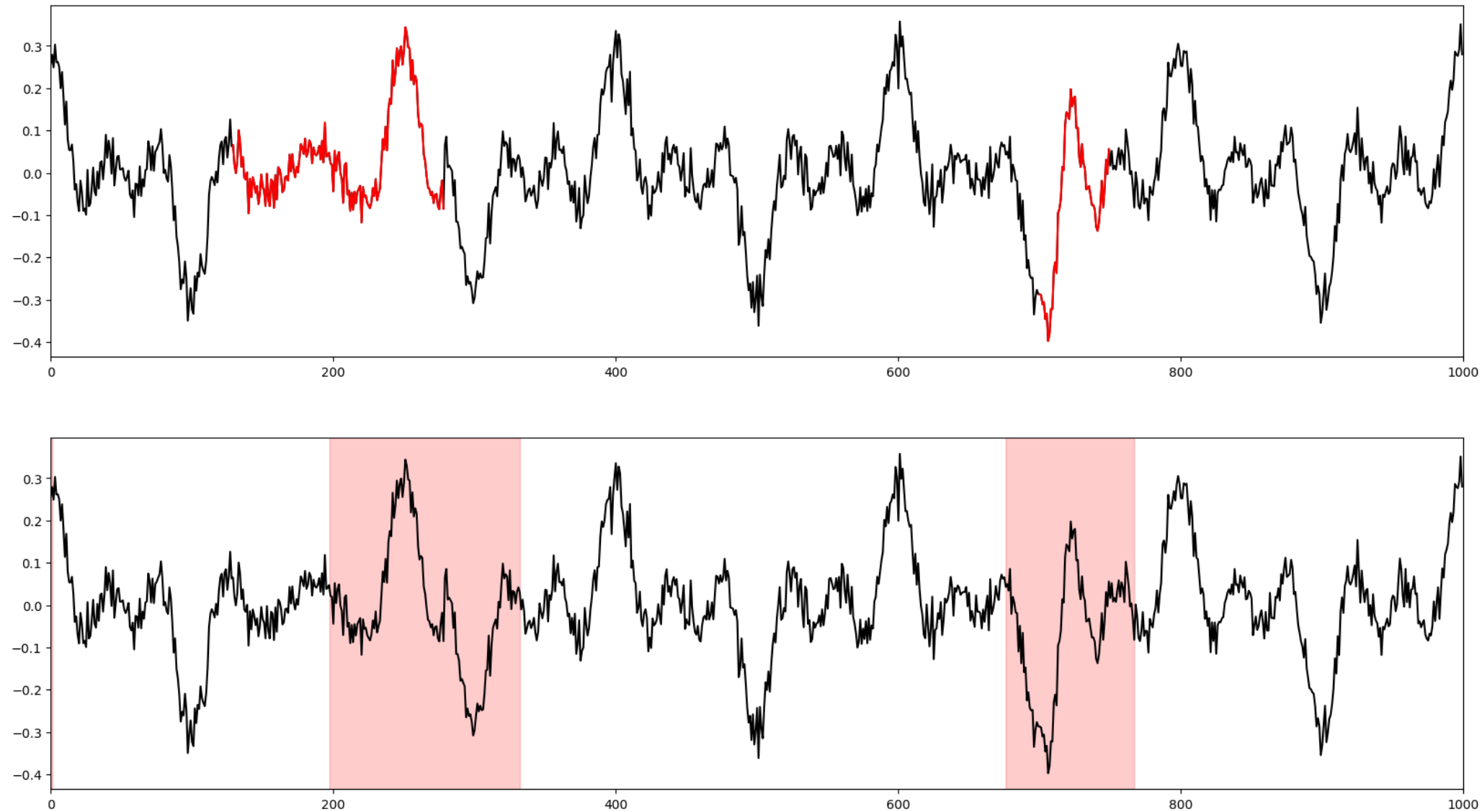
Average of LOF and K-Means



Threshold

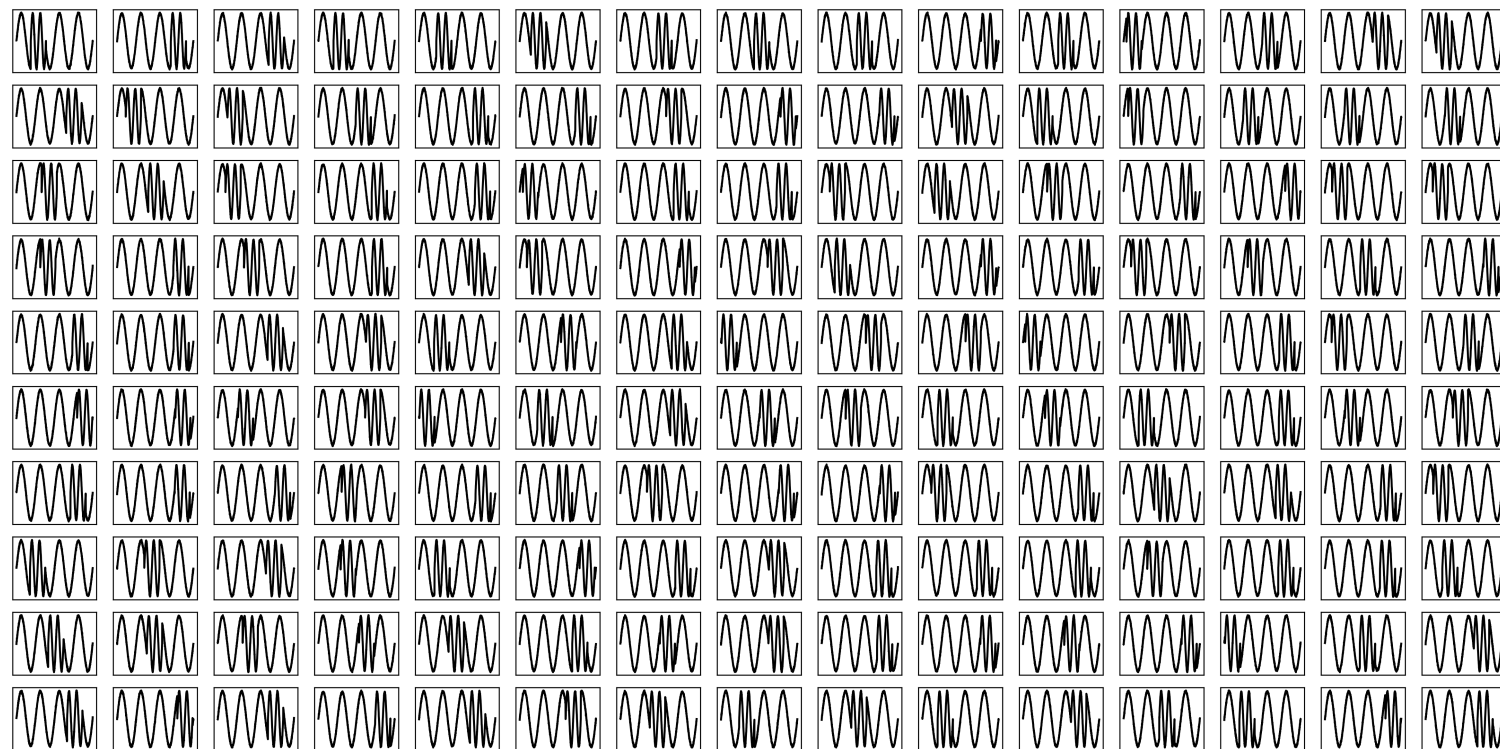
Everything above threshold = anomaly

The Result are Interval Annotations for Anomalies



Not perfect, but close enough

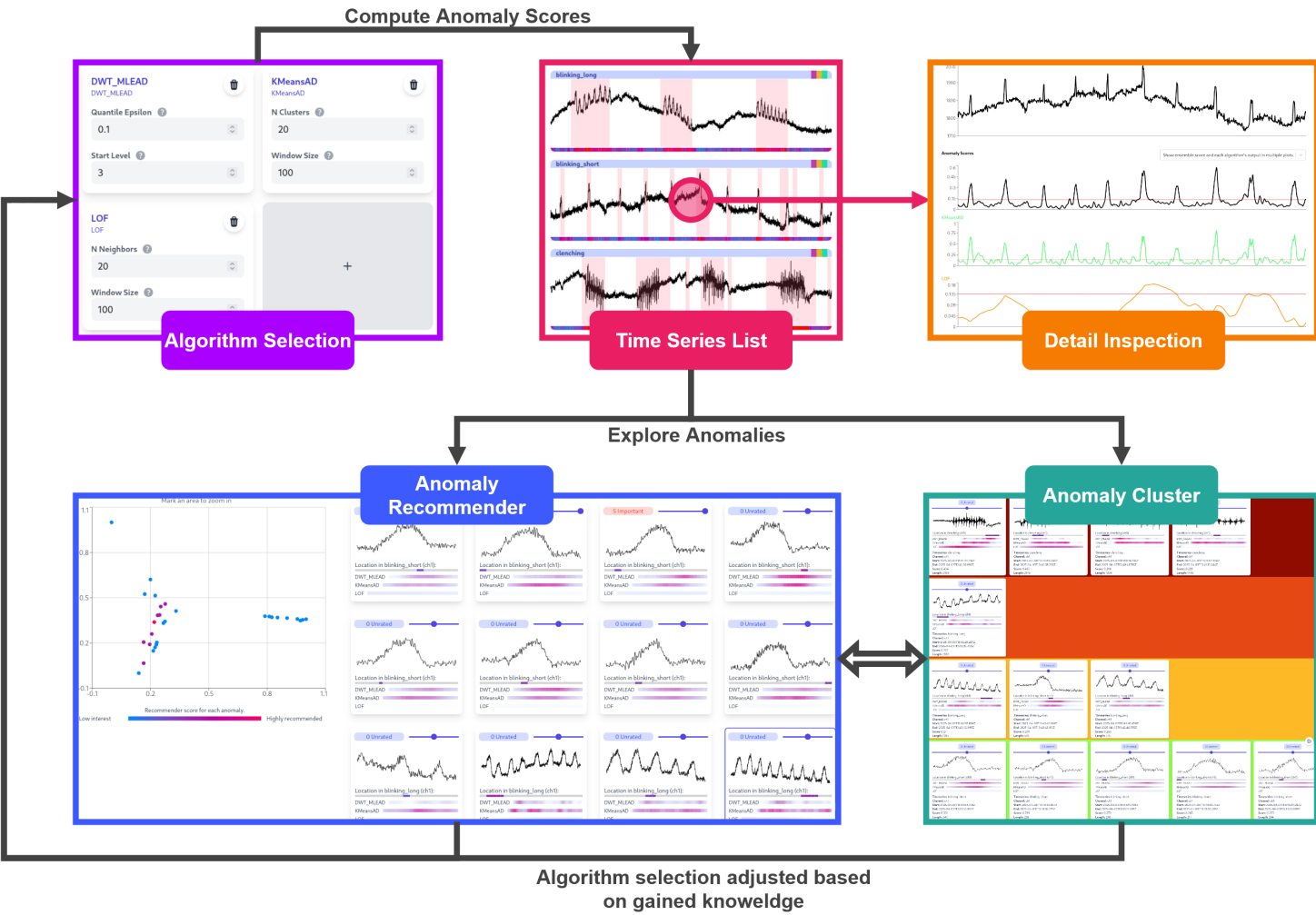
Coming back to this:



We now ask:

1. Which anomalies commonly arise?
Can they be categorized?
2. Which strengths and weaknesses do the algorithms exhibit?

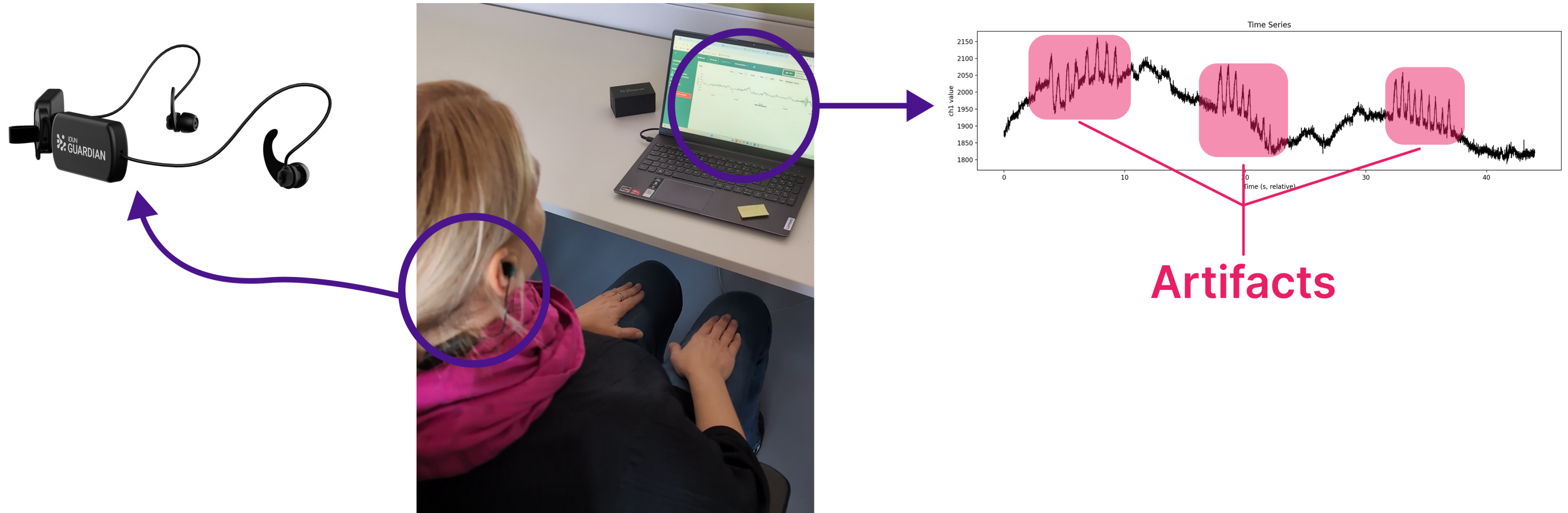
Introducing AnoScout



AnoScout = Playground for
anomaly detection algorithms

Our contribution: A workflow to
explore anomalies

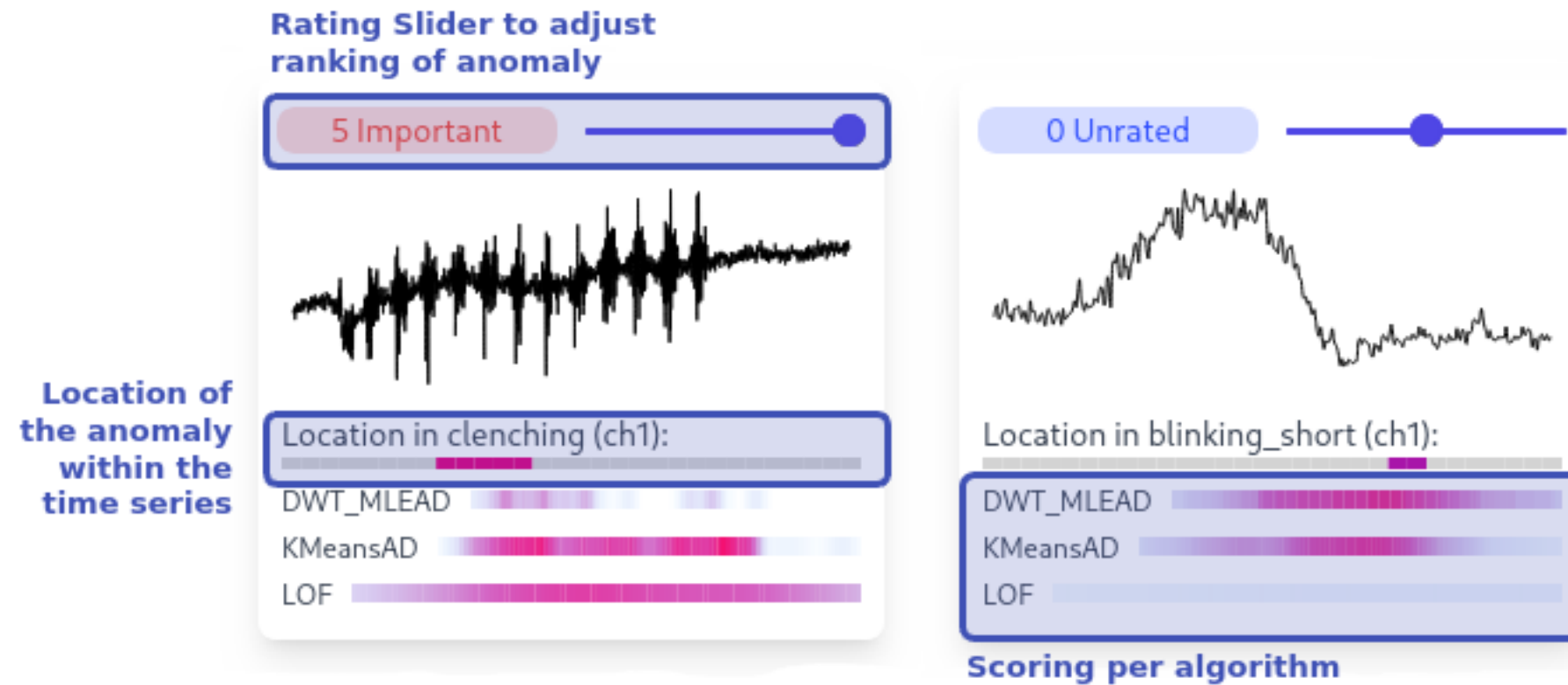
Scenario: EEG Artifact Detection



Extract Anomalies



Each anomaly is represented through a card



Explore Anomalies

Projection Based



Step 3: Rank Anomalies

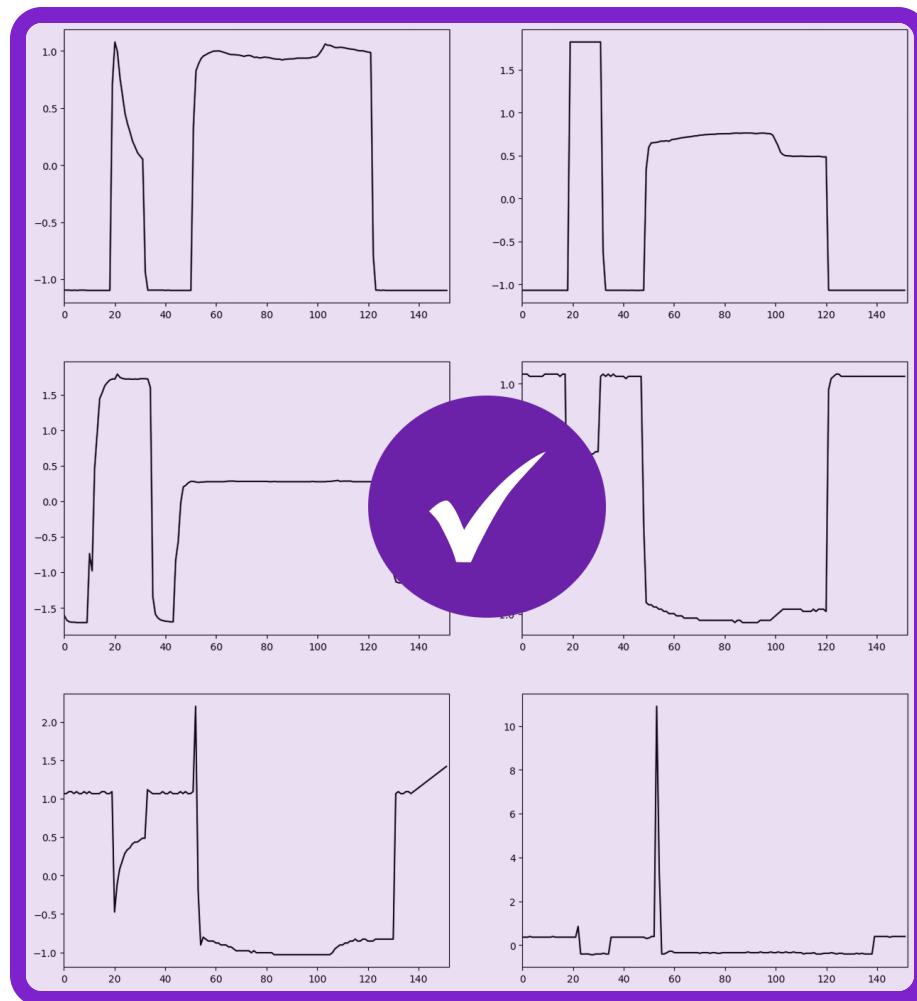


This was all unsupervised.

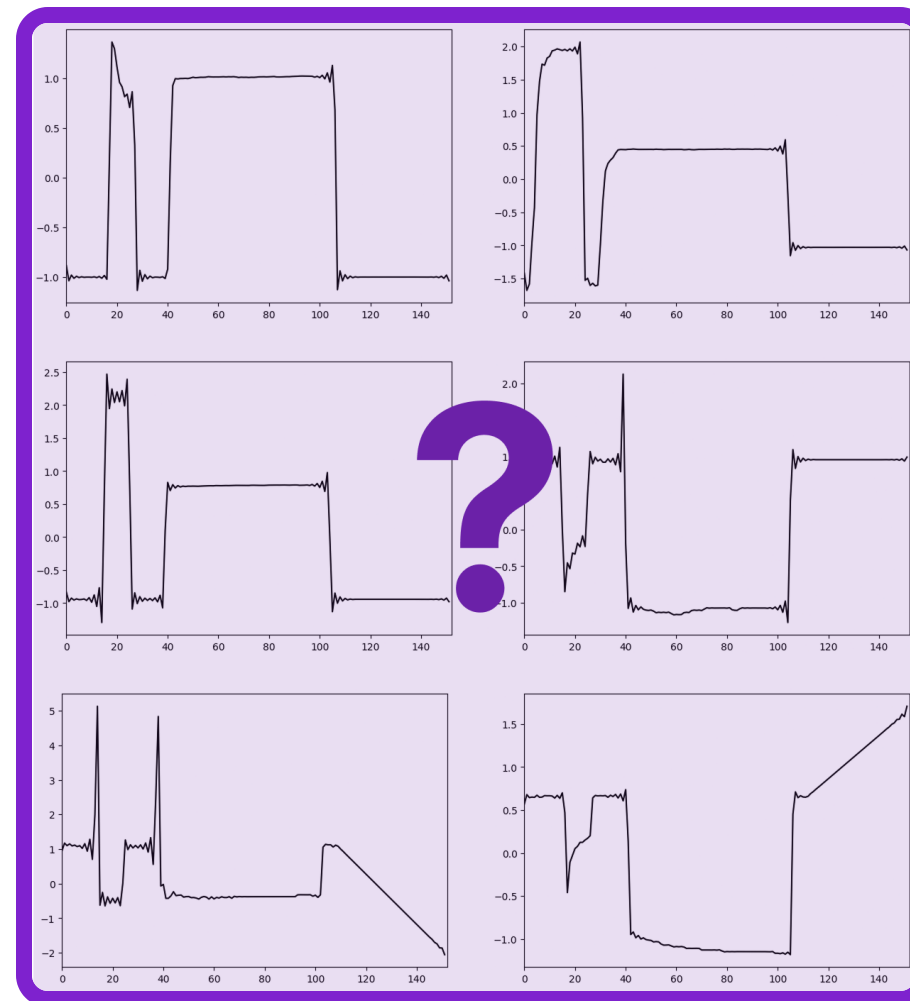
What if I already know the expected behavior?

Scenario: Manufacturing

We know about several types of normal behavior:



But which kind of anomalies can arise?



How can we configure a classifier for that?

AnoScout supports configuring a classifier

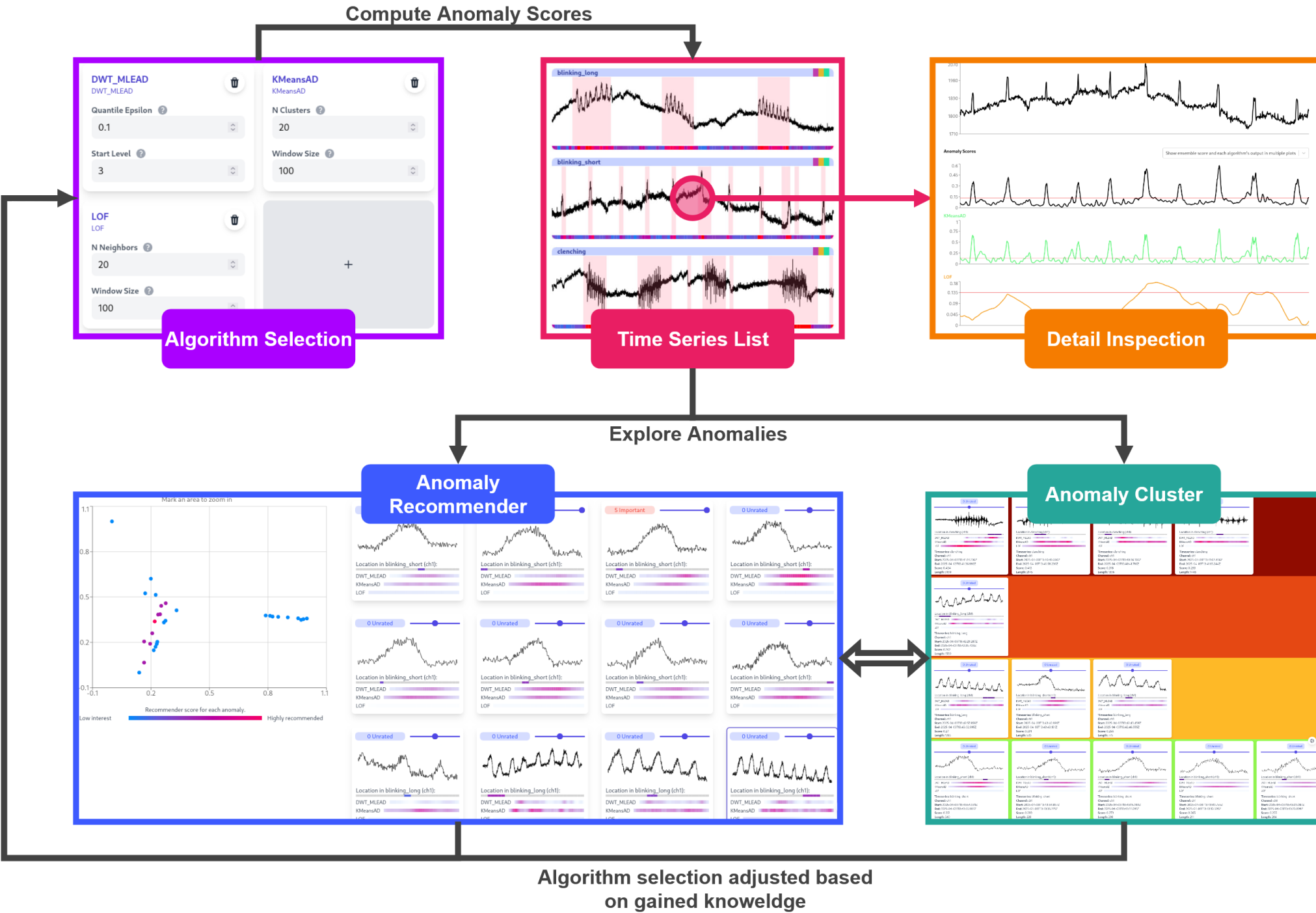


Explore Anomalies

Cluster Based



Summary



Future Work

- Algorithm Parameter Guidance
- Multivariate Time Series
- Progressive Exploring for Large Datasets

Thank you!



Julian
Rakuschek



Michael
Leitner



Jürgen
Bernard



Selina
Wriessnegger



Tobias
Schreck



Open Source



Slides