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Overview

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AustroVis AnoScout

A Time Series Anomaly Detection Sandbox

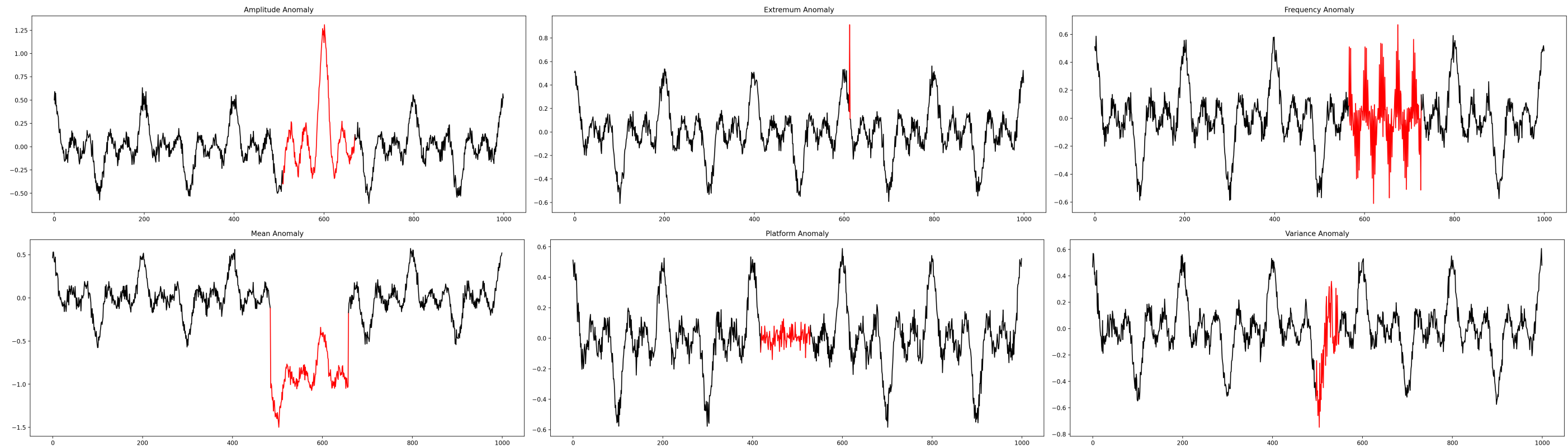
Julian Rakuschek

25.02.2025



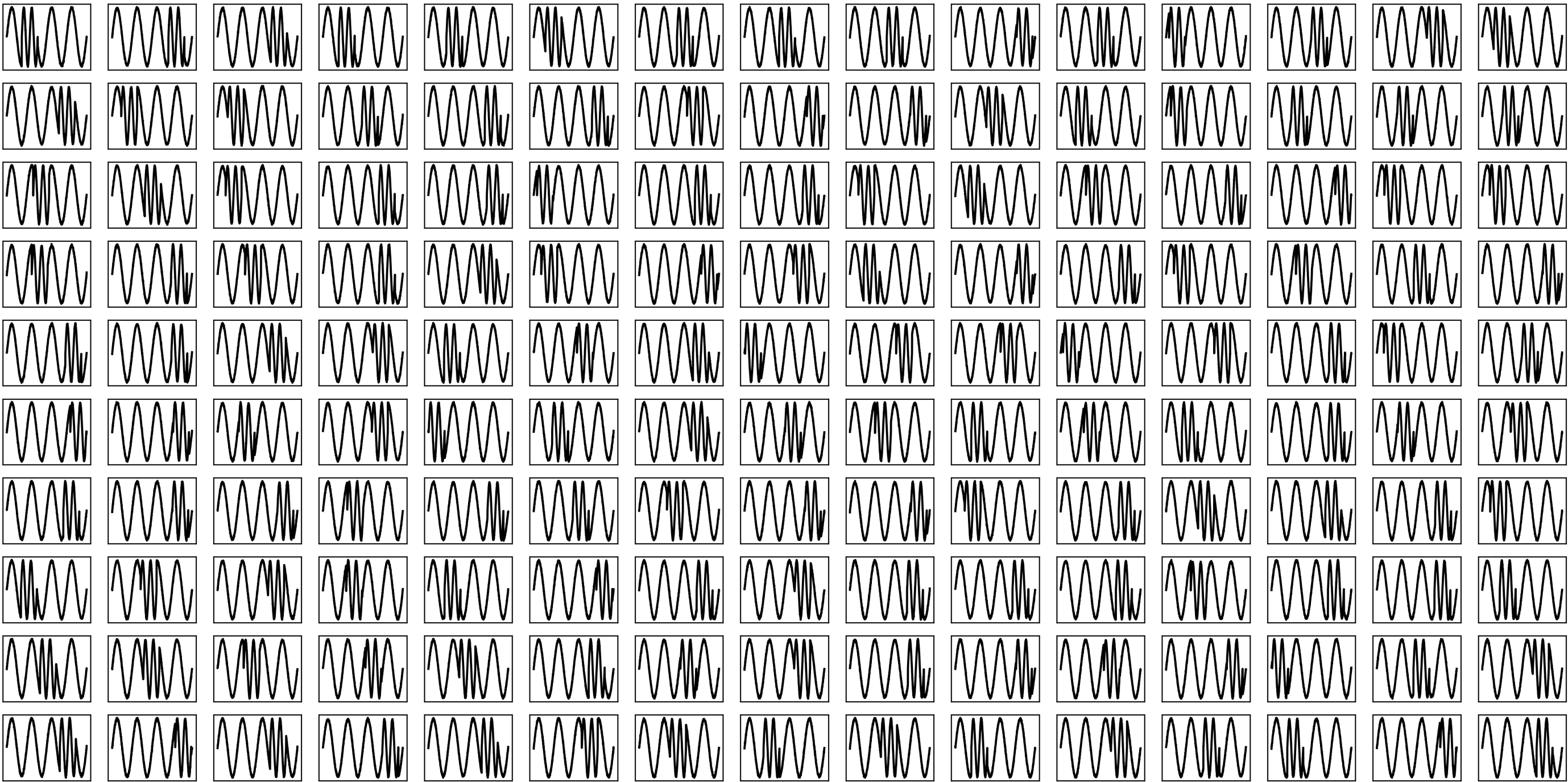
Introduction

Anomalies in time series (Selection)



Anomaly = Unexpected Pattern

Check every time series by hand?



Let algorithms do the work!

Can we build a "sandbox" to find good ones?

Algorithm Types

Two types of anomaly extraction

Scoring

Classification

Two types of anomaly extraction

Scoring

Anomaly score per timestamp

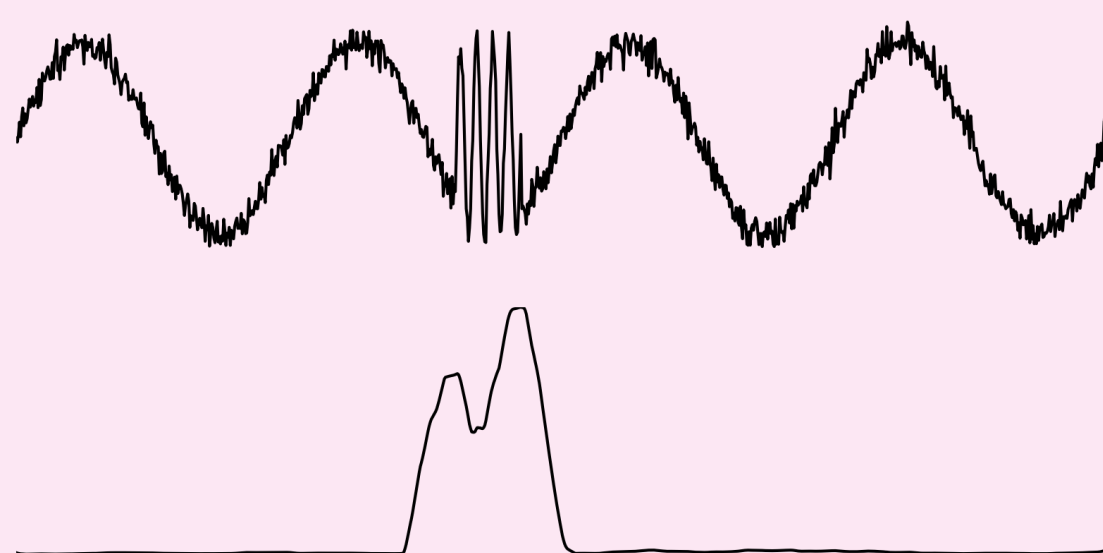
Output: Time Series
Unsupervised algorithms

Classification

Two types of anomaly extraction

Scoring

Anomaly score per timestamp



Output: Time Series
Unsupervised algorithms

Classification

Binary decision per segment

Users define normal behavior
One Class Classification

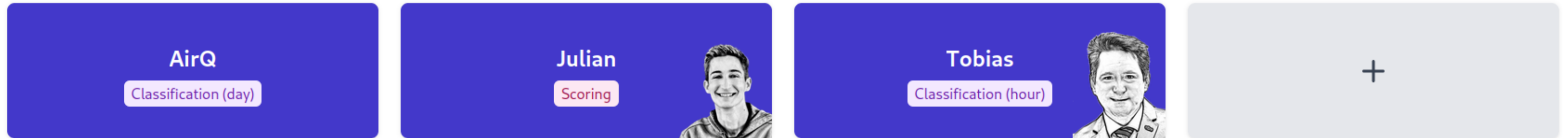
Two types of anomaly extraction

Scoring: Users have no knowledge about the data

Classification: Users can define normal behavior and segments

Type is bound to bucket

Buckets



Custom algorithm repertoire per bucket

Bucket List > Bucket Julian > Settings

Anomaly Extraction

Algorithms

Manual Markings

MERLIN
MERLIN

Max Length ?
50

Min Length ?
10

STOMP
STOMP

Window Size ?
10

DWT-MLEAD
DWT_MLEAD

Quantile Epsilon ?
0.01

Start Level ?
3

KMeansAD
KMeansAD

N Clusters ?
20

Window Size ?
100

LOF
LOF

N Neighbors ?
20

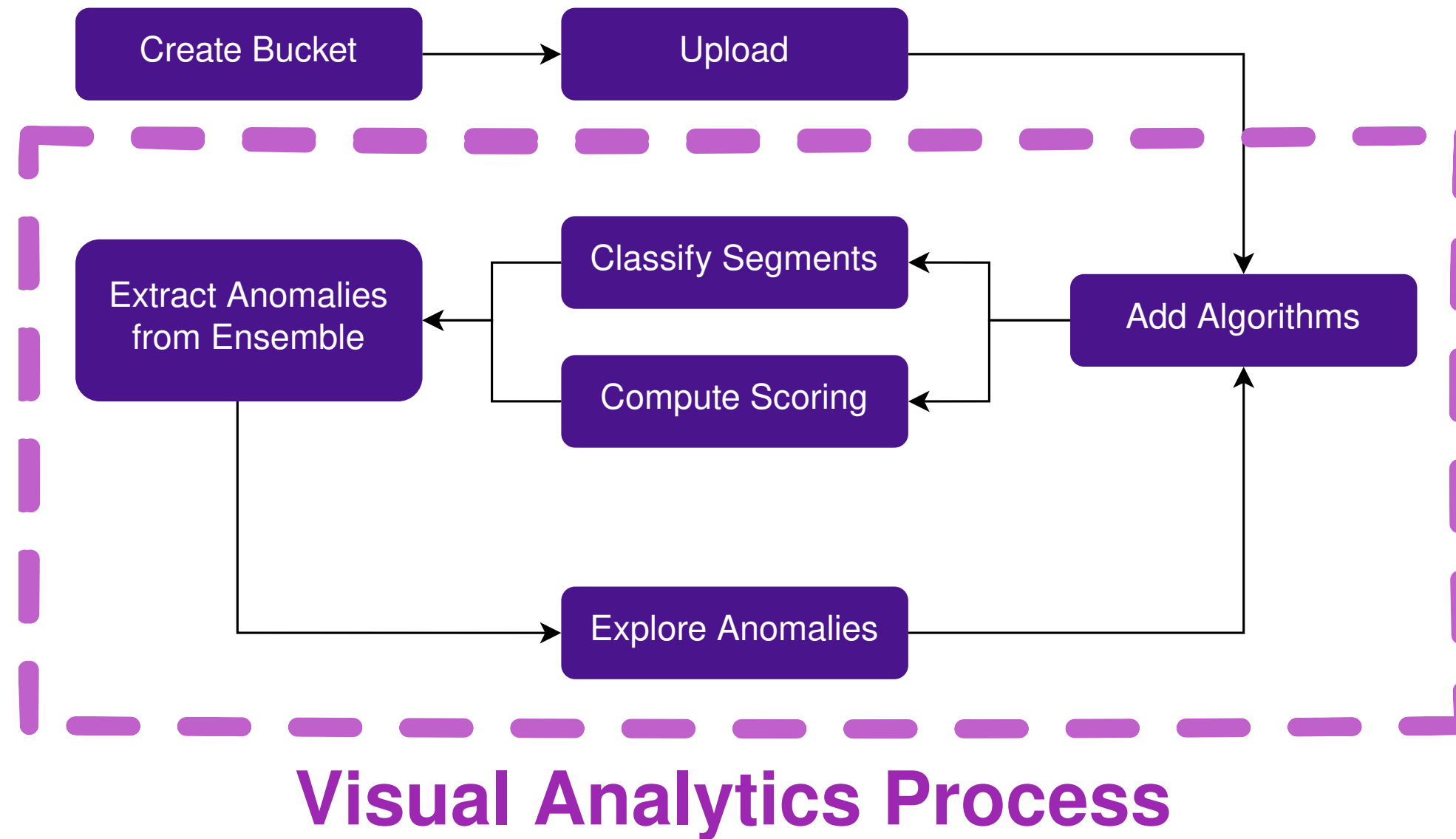
LOF with more neighbors
LOF

N Neighbors ?
30

+

AnoScout

The AnoScout Pipeline



Exploring Anomalies



Exploring anomalies is achieved through a linked view, users may further provide feedback on the importance of an anomaly to satisfy a specific information need.

Clustering Anomalies



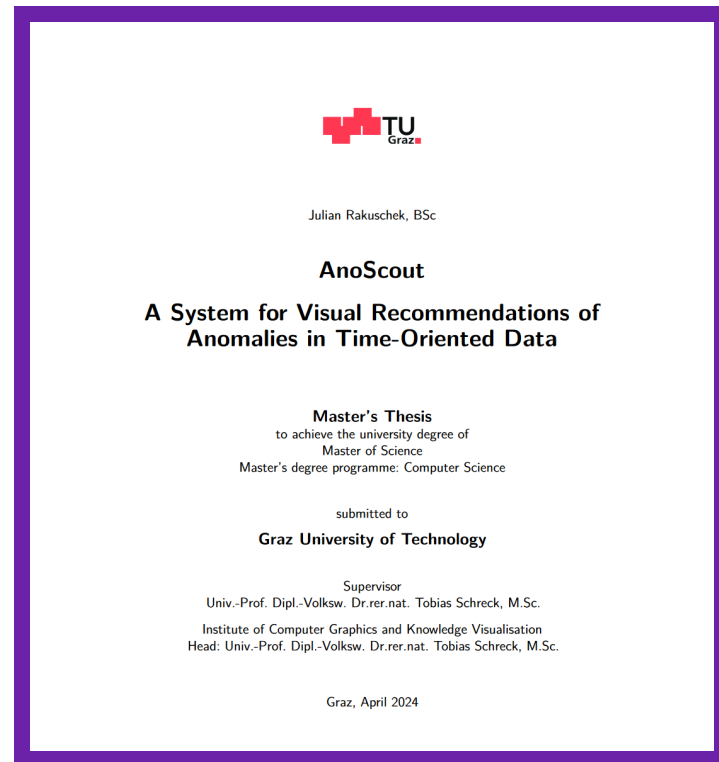
The anomalies can be arranged by similarity in the scatterplot, such that similar anomalies are grouped together. This enables the user to discover patterns in the dataset.

Conclusion

Main features of AnoScout summarized

1. "Playground" for testing various algorithms.
2. Exploration pipeline for anomalies in time-oriented data.
3. Using user labels to fine-tune the system.

From Thesis to VIS



Plan: Short Paper Track

The committee also welcomes papers describing new systems or tools that offer practical value.

Open Questions

- Multivariate Time Series
- Novelty
- Evaluation
- Real World Use Cases
- Scalability

Questions?