Maintenance schedule optimisation
using time warped causal models
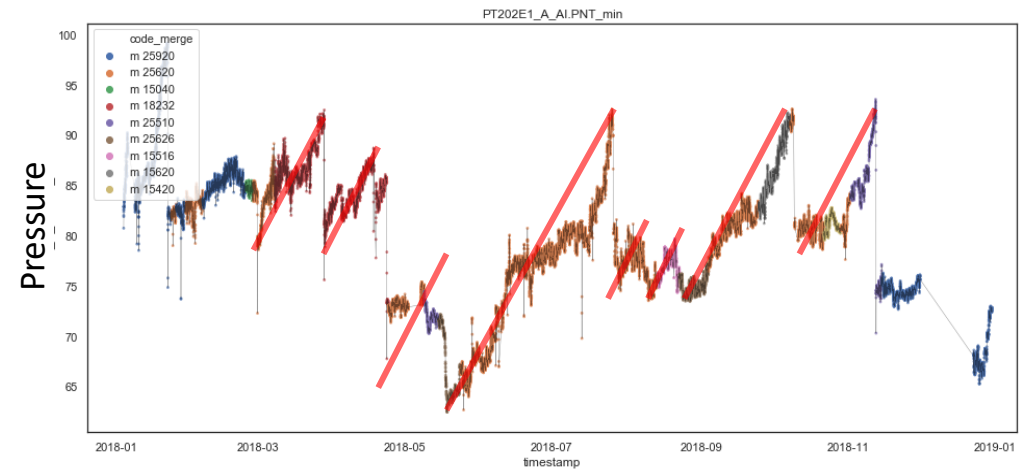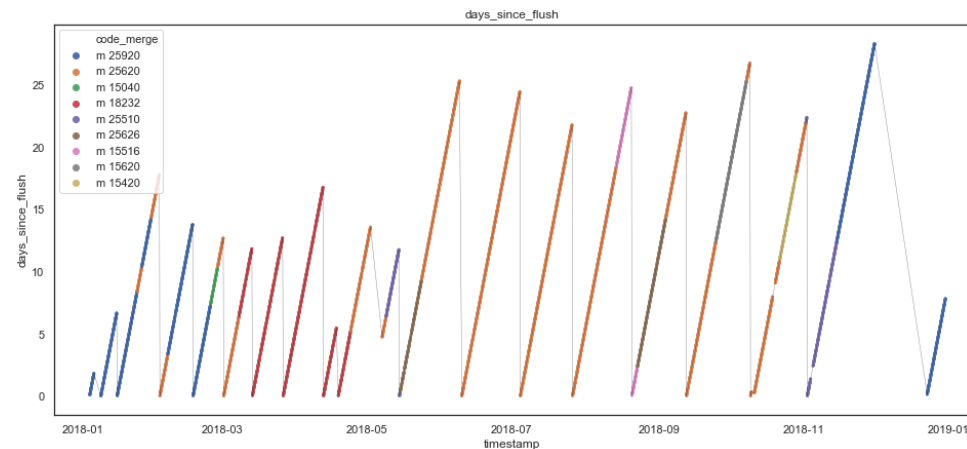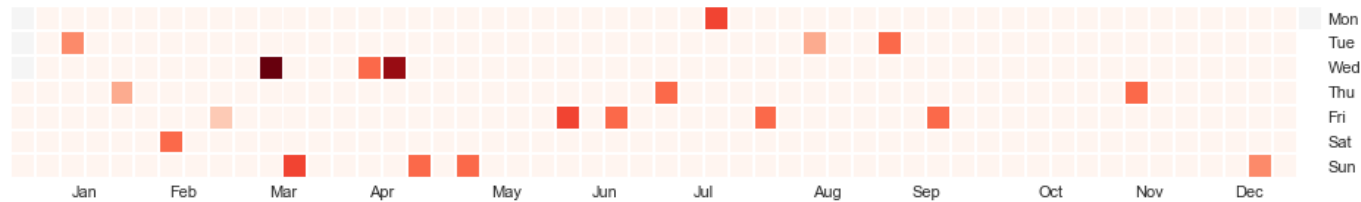
Faktion

Jeroen Boeye

FAKTION

Introducing Glanzstoff

Glanzstoff production process inefficiencies

Challenges

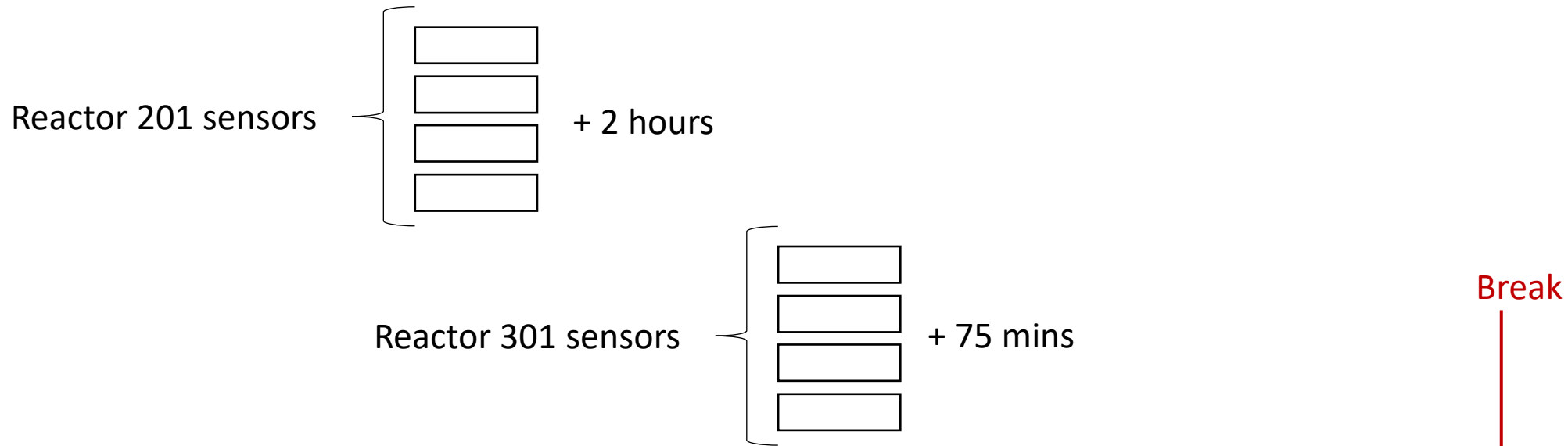- Timing of expensive maintenance operations (flushes)

- Quality of final product after long process

FAKTION

Predictive maintenance: when to flush?

What is the effect of flushing?

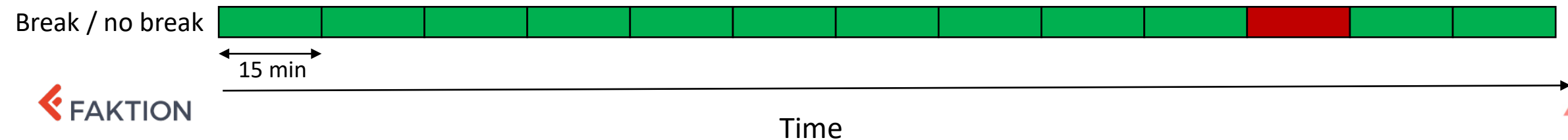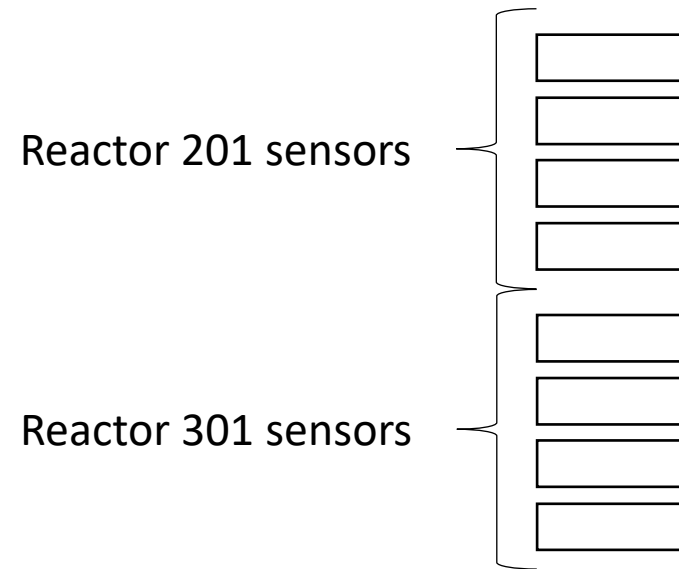# Adjust timestamps to bring to same time block

Adjust timestamps to bring to same time block

Reactor 201 sensors

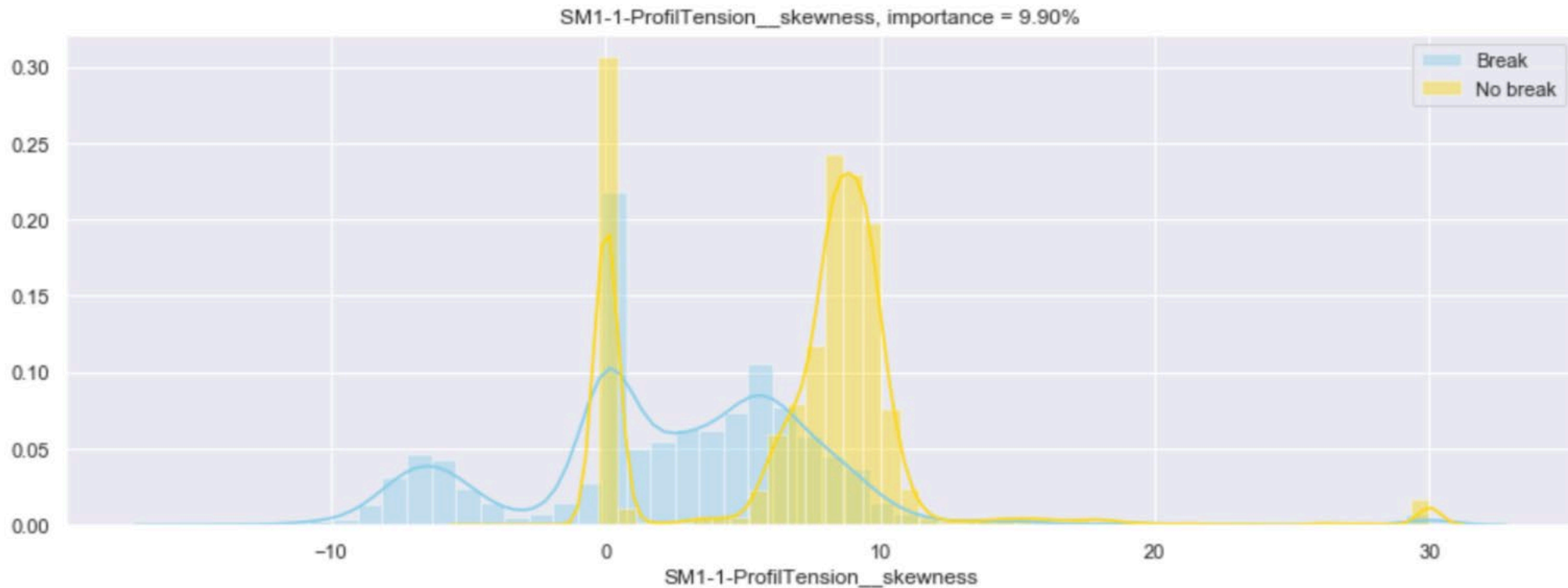Reactor 301 sensors

Break / no break

15 min

Time

FAKTION

Use aligned data to train (XGBoost) model

Break / no break

15 min

Time
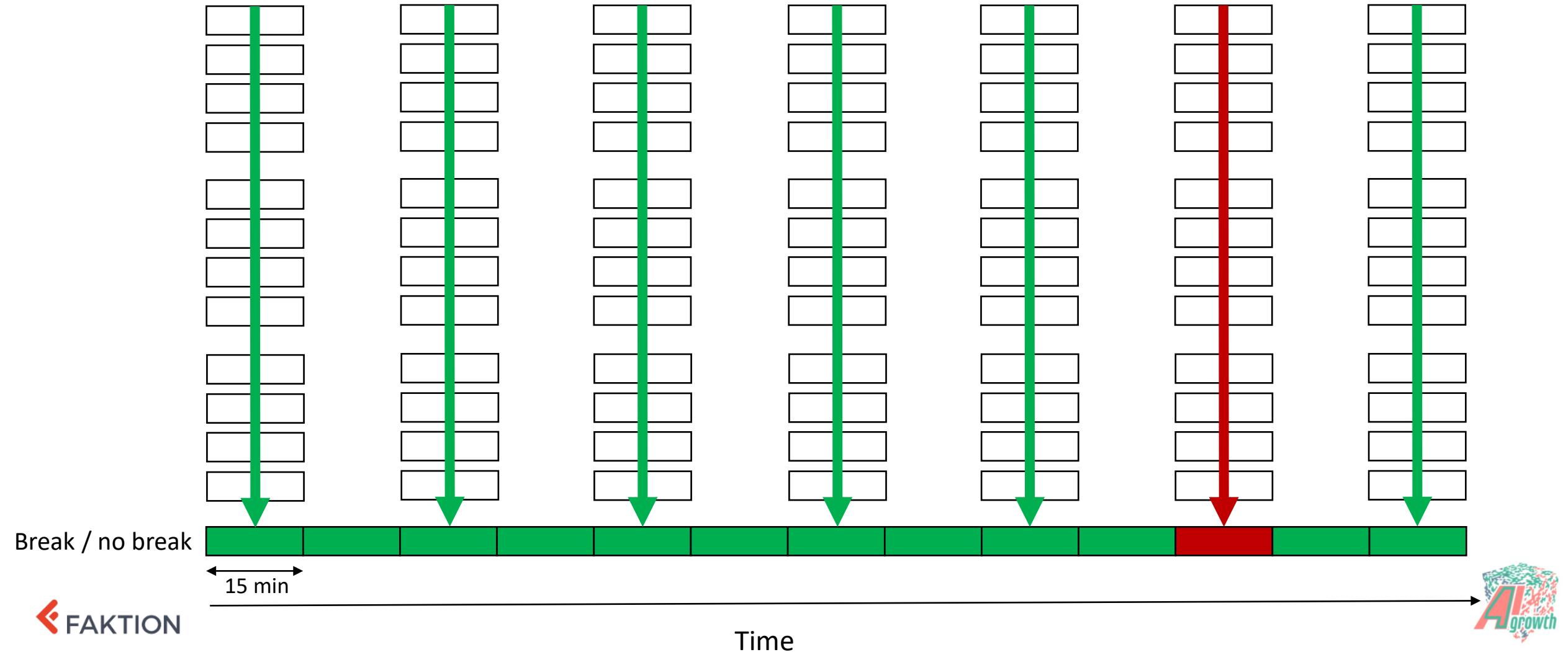
Additional insights: individual feature effects
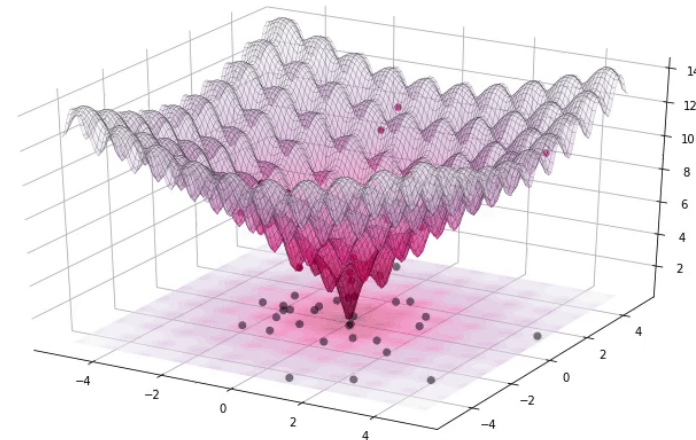

SM1-1-ProfilTension__skewness, importance = 9.90%

Optimization of 13 setpoint features
Using the differential evolution algorithm

- Goal: find the settings with the lowest total predicted number of breaks

- Constraints: values must remain within observed boundaries

- Predicted reduction in breaks of up to 35%

FAKTION

Status & Looking forward

- First iteration of optimal settings have been reviewed by experts

- Currently awaiting first trials

- Try reinforcement learning for even more optimal control

FAKTION

Lessons learned

- Do not underestimate feature engineering

- Do not reinvent the wheel

- Communication is key
  - Expectation management: what can vs what can't we do with this data
  - Visualise results as clear as possible

FAKTION