# PRESED -
# Predictive Sensor Data Mining for Product Quality Improvement

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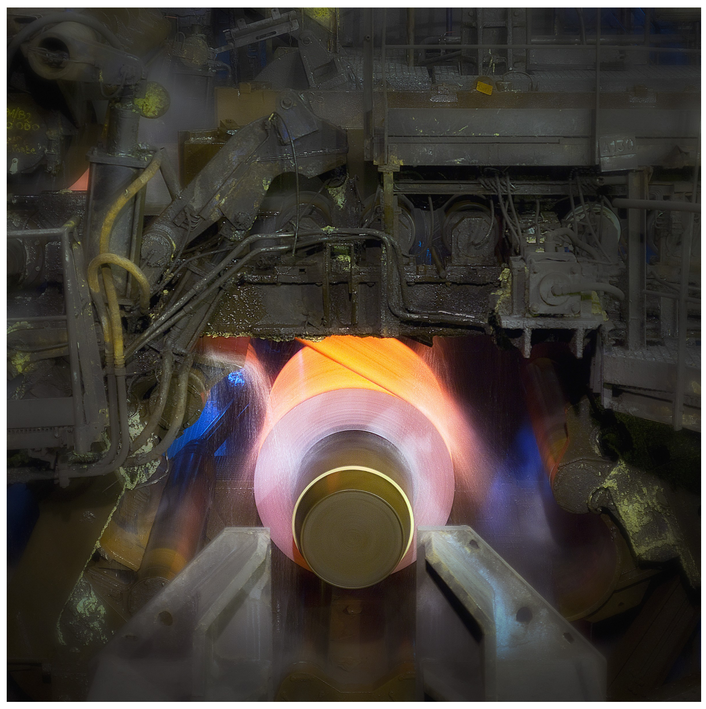
## Project Overview

Manufacturing high quality steel products is a very complex process with a lot of intermediate steps.
Modern steel plants also produce huge amounts of complex data from sensors and production parameters.
The goal of our project is to develop new methodologies to help steel plants to improve their products and reduce manufacturing costs.

## Use Cases

- Identifying causes for low product quality
- Predict the quality of a product during production as early as possible
- Integrate expert knowledge for different production sites



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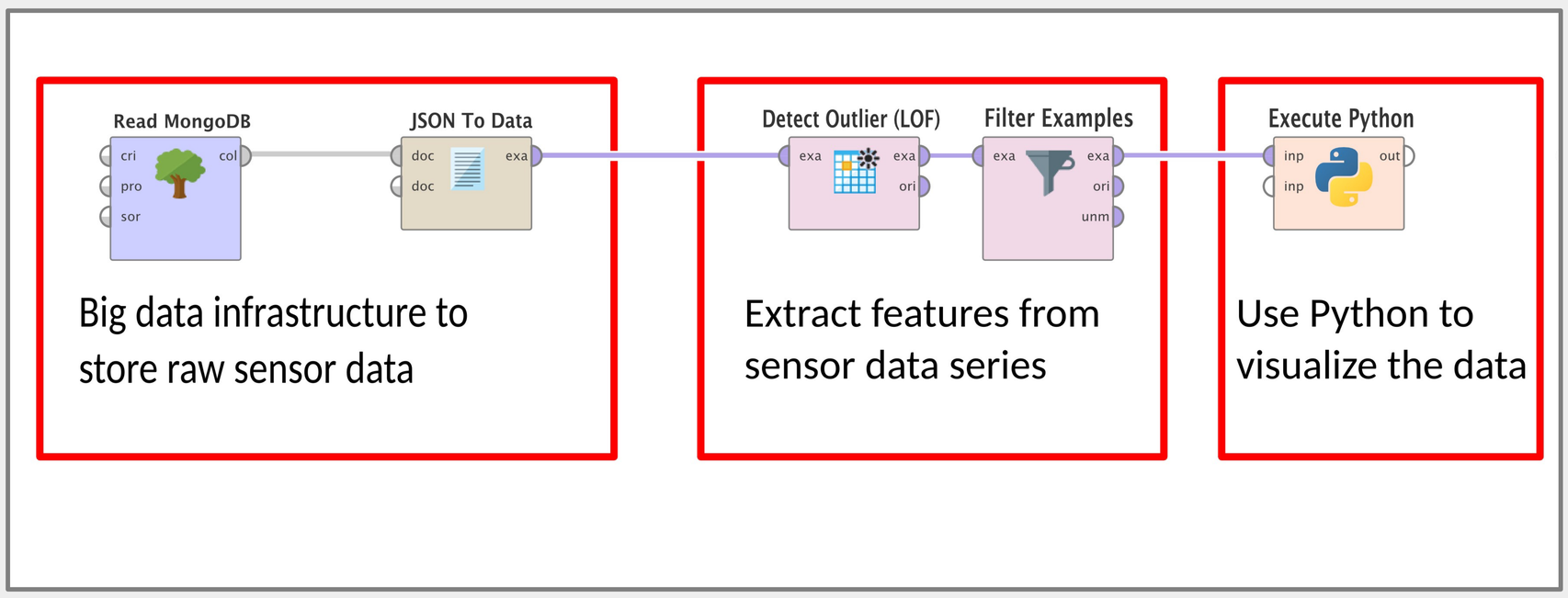
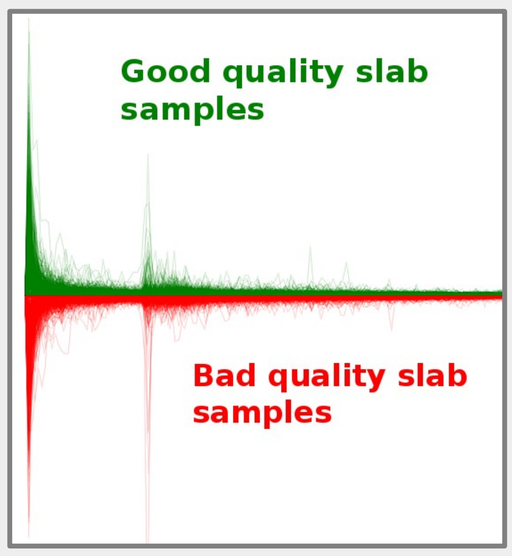


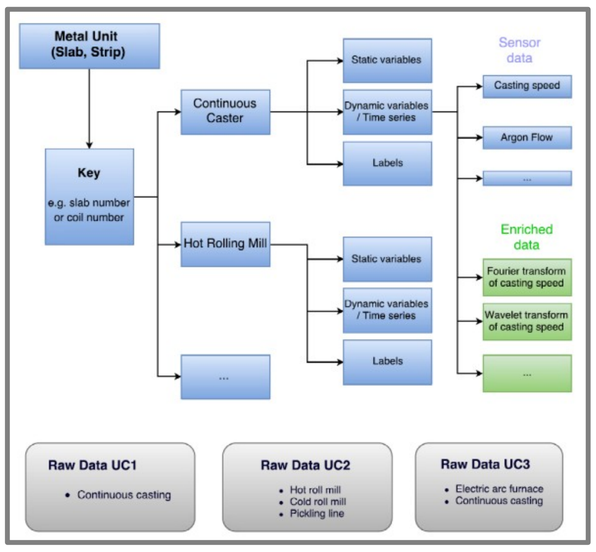

RapidMiner process showing the access and transformation of the raw data




Overlay of Fourier transformed signals

## Challenges

- Design a data structure to track the material over the complete production process
- Tracking is difficult as the product changes shape and quantity during processing (rolling, cutting)
- Huge amount of raw data (several hundred parameters, with a frequency of 1-10Hz over a 2-3 year period)




Generic data model for the PRESED use cases

## Technologies used

- *MongoDB* as NoSQL database to handle the production data
- Data visualization tool box written in *Python* and integrated into *RapidMiner* [1]
- *Representation learning* to process time series information [2]
- Time series shapelets for pattern discovery [3]
- Outlier detection methods for time series [4]
- Data and model management with *RapidMiner*
- Dashboards for interactive exchange between plants and data mining experts
- Ontology management with *KASEM* [5]

## References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## Project partners

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**www.presed.eu**

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