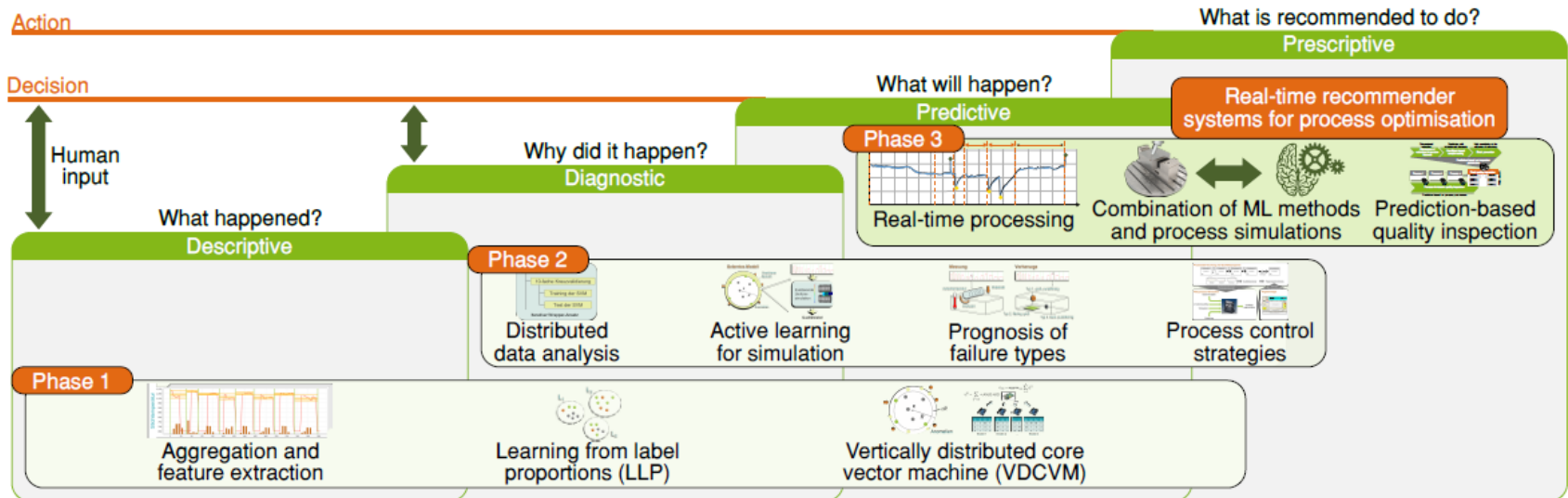Current research of project B3 from CRC 876

Data Mining on Sensor Data of Automated Processes

Jacqueline Schmitt, Institute of Production Systems, Mechanical Engineering
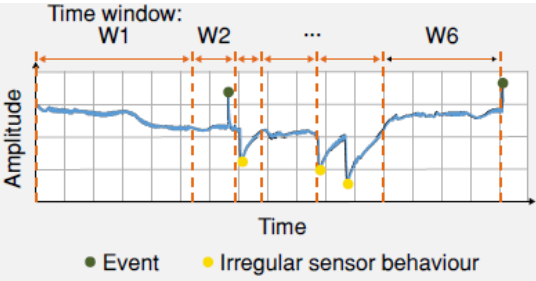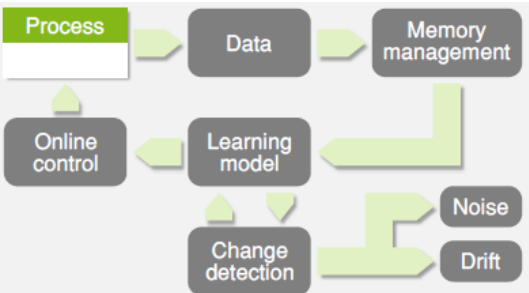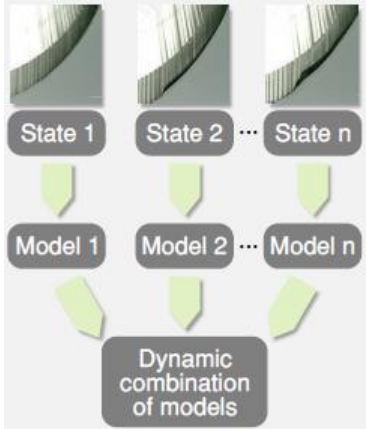
# Research focus



## Challenges

- Constantly changing process conditions
- Increasing complexity in industrial processes
- High product variety
- Short reaction times for process adaptions
- Complex, hard-to-measure process characteristics

Current and planned research on

# Real-time processing

| Real-time aggregation and feature extraction | Real-time learning and model adaption | Online management of many models |
|---|---|---|
| <ul><li>Adaptive windowing of streaming data</li><li>Online aggregation and feature extraction</li><li>Preparation and indexation of sets of features</li><li>Automatic real-time selection of data representation</li></ul> | <ul><li>Filtering, analysis and learning from data in real-time</li><li>Online detection of concept drifts</li><li>Distinction between drift and noise</li><li>Managing interactive data sets and models</li></ul> | <ul><li>Changing combination rules</li><li>Continuous update of learners</li><li>Structural update of learners</li></ul> |
|  |  |  |

Current and planned research on

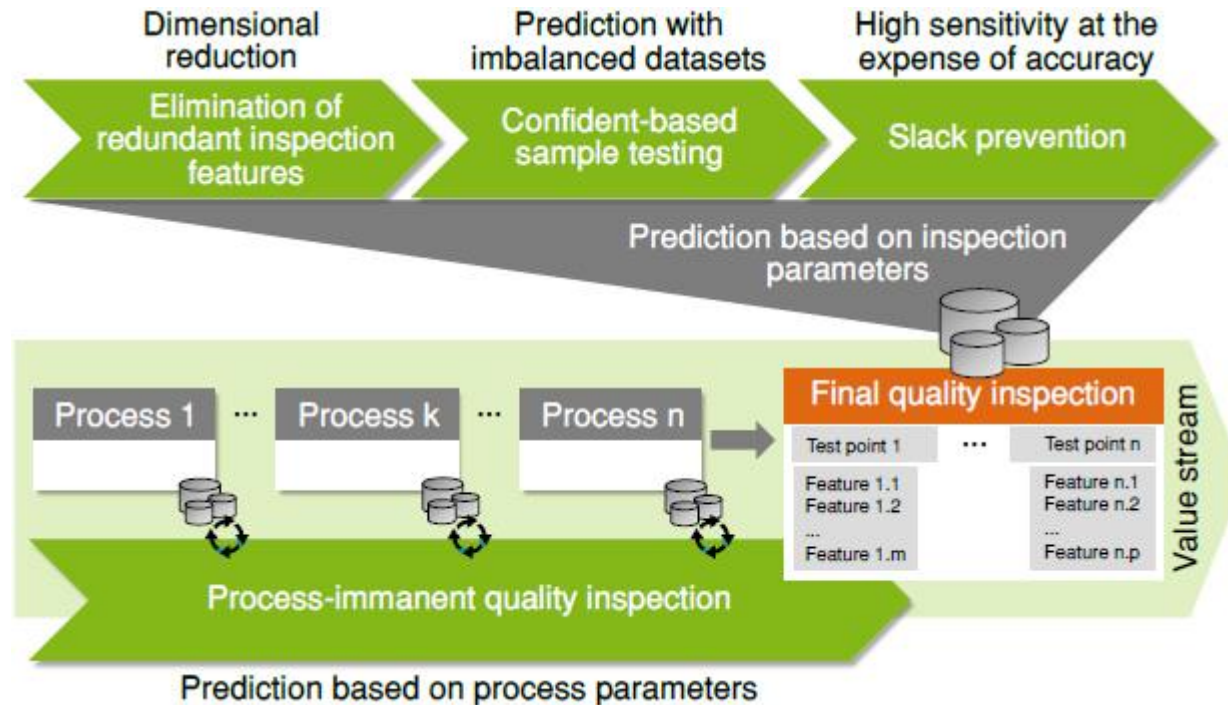# Combination of ML & process simulations for real-time optimisation



- How can process simulations and machine learning be reasonably combined?
- How can process configurations be identified to refine pre-trained models?
- How should processes be adapted online based on model predictions?

Current and planned research on

# Utilisation of quality predictions for product quality inspection



- How can the final quality inspection as a bottleneck be relieved by means of suitable strategies?
- How can the ratio of test duration to slack be optimised?
- How can relevant quality-related parameters be identified?
- How should quality control loops be positioned within process chains?

# Thank you for your kind attention!

## Contact

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