ZeMA – Research group measurement technology
ZeMA – Arbeitsgruppe Messtechnik

ZeMA
Zentrum für Mechatronik
und Automatisierungstechnik

Lab for Measurement Technology

UNIVERSITÄT
DES
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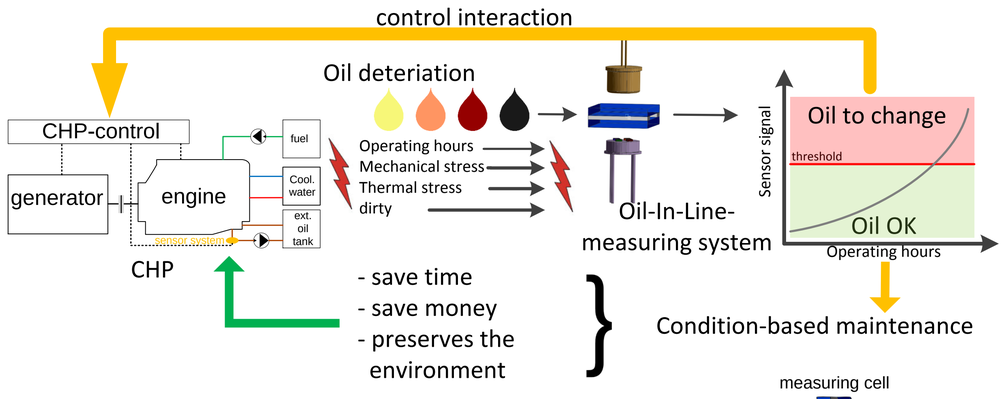
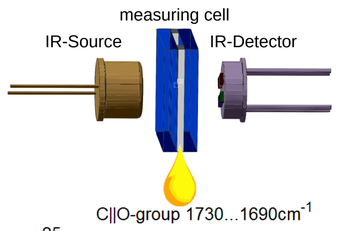
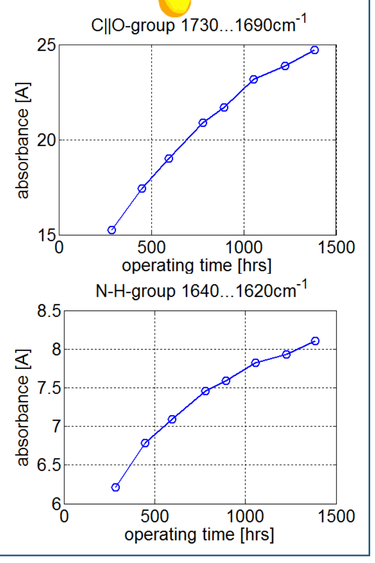
Fluid quality monitoring, e.g. hydraulic fluids, lubricants



- Online quality monitoring of
  - hydraulic fluids
  - CHP engine oils
  - cooling lubricants
  - gas or air content in oil

  with multi-channel IR measurement
- Spectral characterization of samples as reference for sensor system
- Measurement system design
- Development of evaluation strategies and algorithms
- Field testing of in- and online capable fluid monitoring system

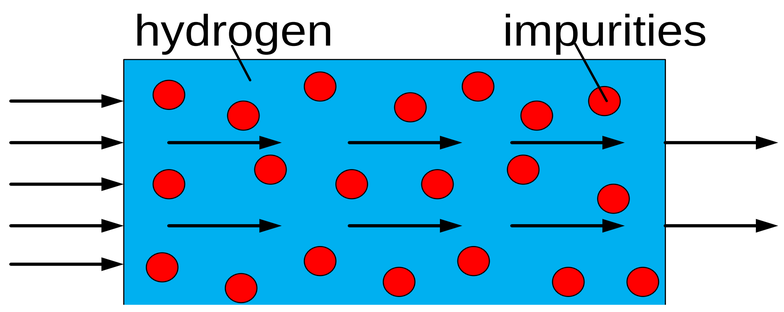




Modular sensor systems for real time process control and smart condition monitoring

- Flexible kit of hard- and software modules
- Simple development of custom sensor systems, e.g. for control and monitoring of electrical drives and positioning systems
- Pertinent for the complete value chain: from production quality control to installation and inline condition monitoring
- Evaluation of exemplary sensor systems in process environments with industrial partners (HYDAC, Bosch Rexroth, Festo)
- High-speed signal processing and evaluation at sensor level for real time process control and condition monitoring
- Data analysis scheme suitable for Big Data applications

Fluid quality monitoring, e.g. high-purity hydrogen



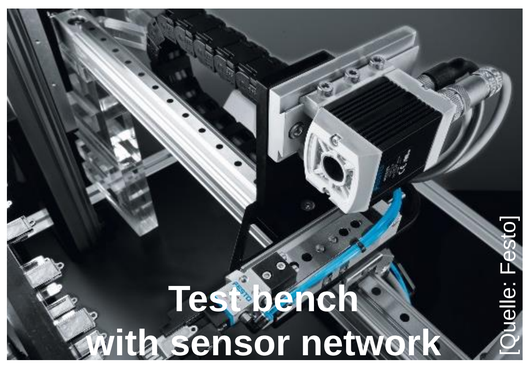
- In- and online capable purity monitoring of high purity gases, e.g. hydrogen for fuel cell applications
- High pressure (~800 bar) infrared measuring system

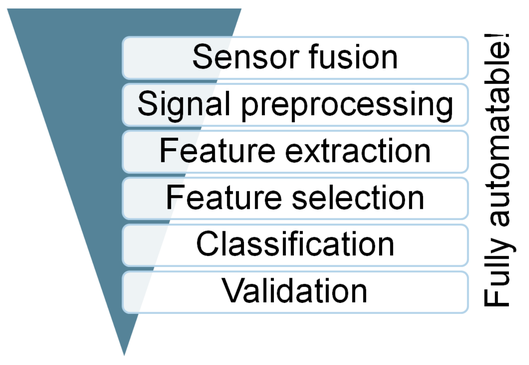
Development of innovative measurement systems

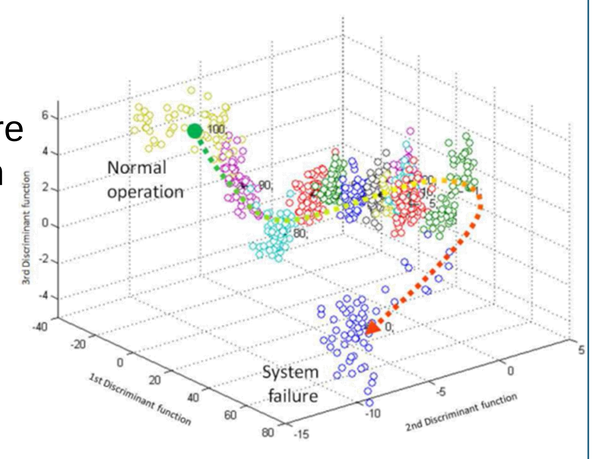
- From measurement principle via electronics and signal processing to complete measurement systems
- Sensor system development for integration in complex processes to create added value
- Examples:
  - Mixing ratio of binary mixtures (e.g. methanol or urea in water)
  - Inline film thickness monitoring of PLD coatings (e.g. alumina on polymer foils)
  - IR sensor system for general condition monitoring of fluids and coatings

Multi-sensor data fusion and automated evaluation methods for sensor networks

- Condition monitoring of complex mechatronic systems for quantification of deterioration and fault processes
- Self-monitoring of sensor networks
- Identification of relevant influence factors for production processes, e.g. production quality
- Evaluation with lab test benches and real process data
- Structuring of data according to machine states (e.g. load or speed range, valve switching)
- Efficient algorithms for feature generation for local details in time and frequency domain
- Automatic algorithms for feature selection and machine learning, e.g. for classification of deterioration states







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