



AERZEN

Compressed air, gas
and vacuum solutions

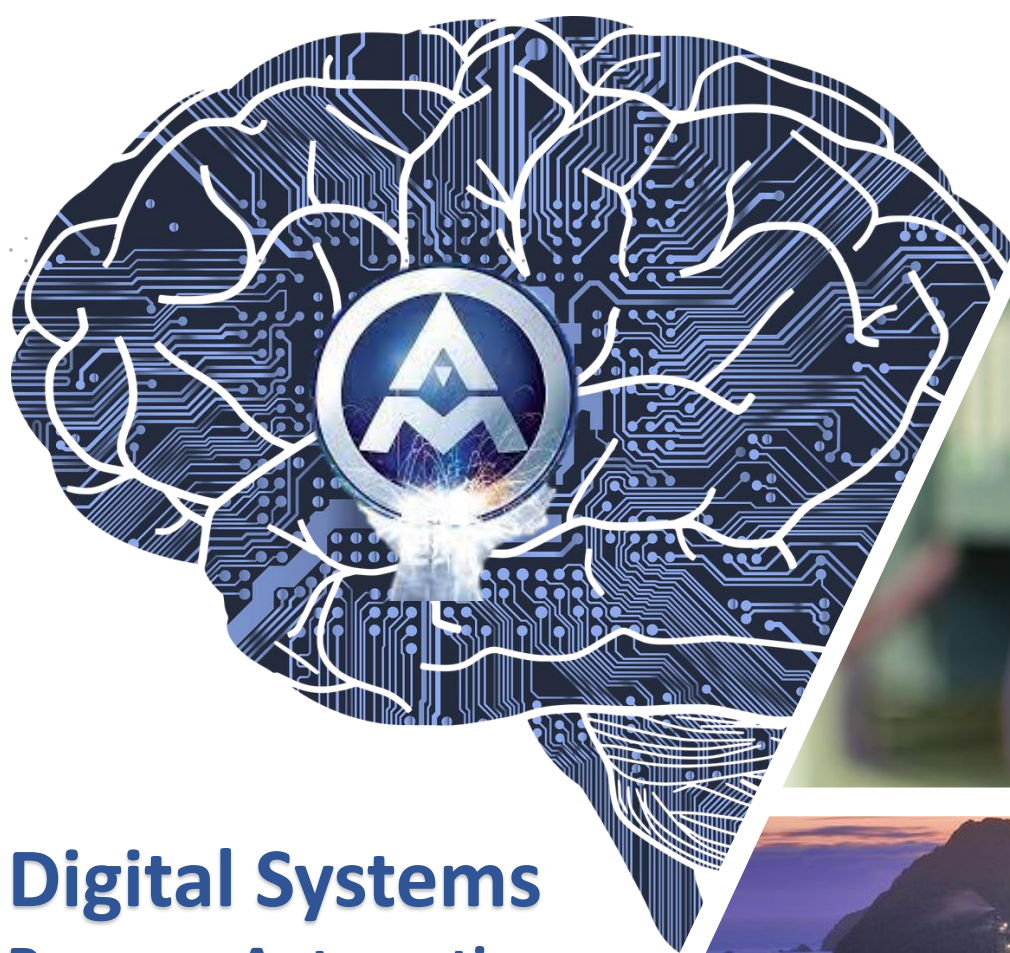
Build scalable AI solutions with MATLAB Production Server in Kubernetes on Azure

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AERZEN Digital Systems GmbH

at

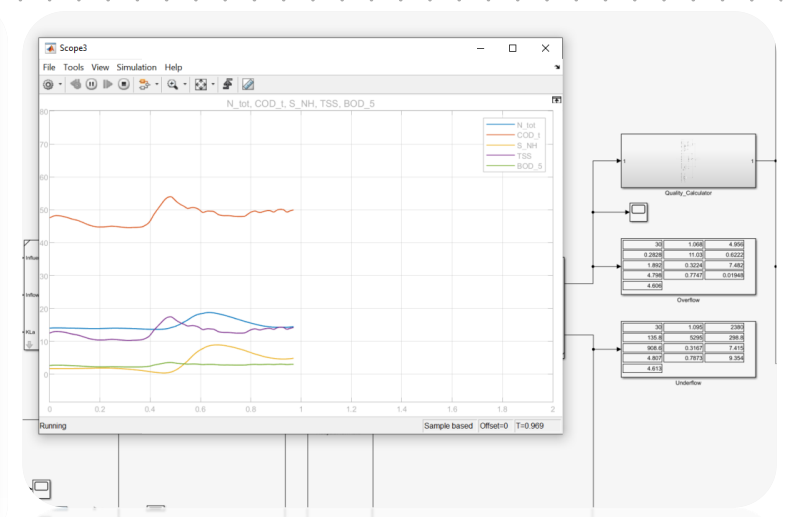
MATLAB Expo



Aerzen Digital Systems
combines **Process, Automation**
and **AI Knowledge** to improve
reliability and **energy efficiency**
of **process plants** Worldwide



Aerzen Digital Systems - Products and Services



AERprogress

- Cloud platform
- Condition monitoring
- Energy monitoring
- Anomaly detection

Individual Consulting

- IIoT integration
- Process monitoring & optimization
- Simulation studies



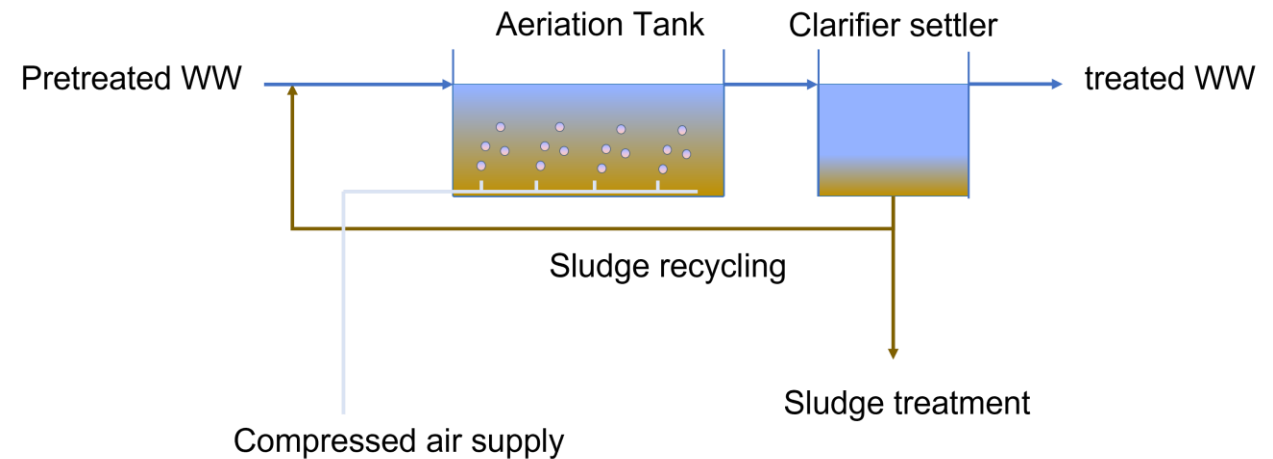
Wastewater Treatment Plant



- Every plant is unique!
- Highly configurable machines
- Different control strategies & hardware

Flexibility & efficiency is crucial!

Activated Sludge Process



Positive Displacement Blowers



Screw Blowers



Turbo blower



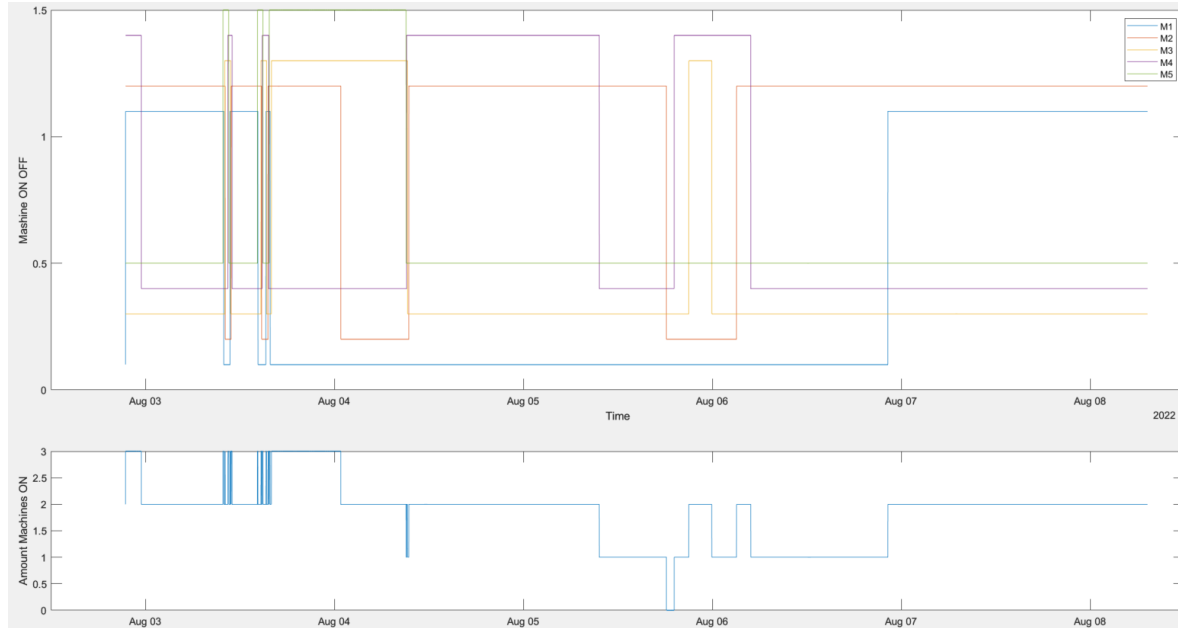
Biogas power generation

Fertilizer production

Monitoring Applications examples



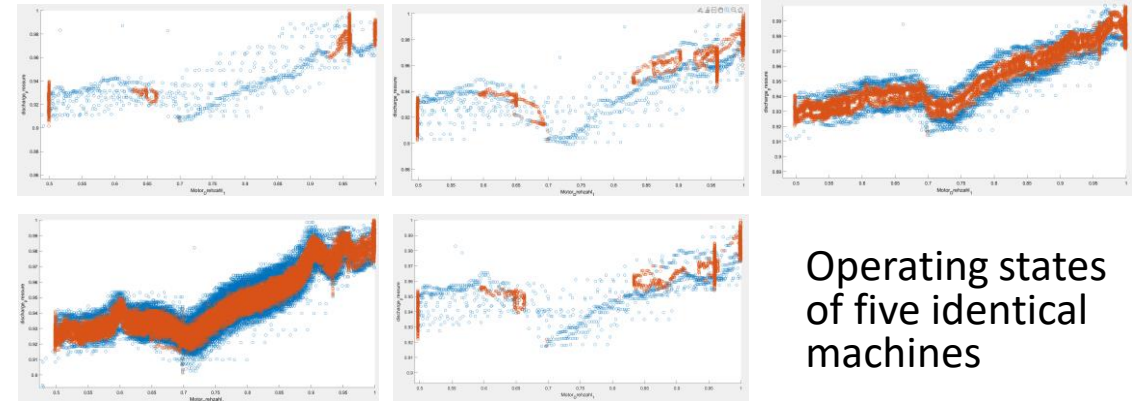
Machine State Classification



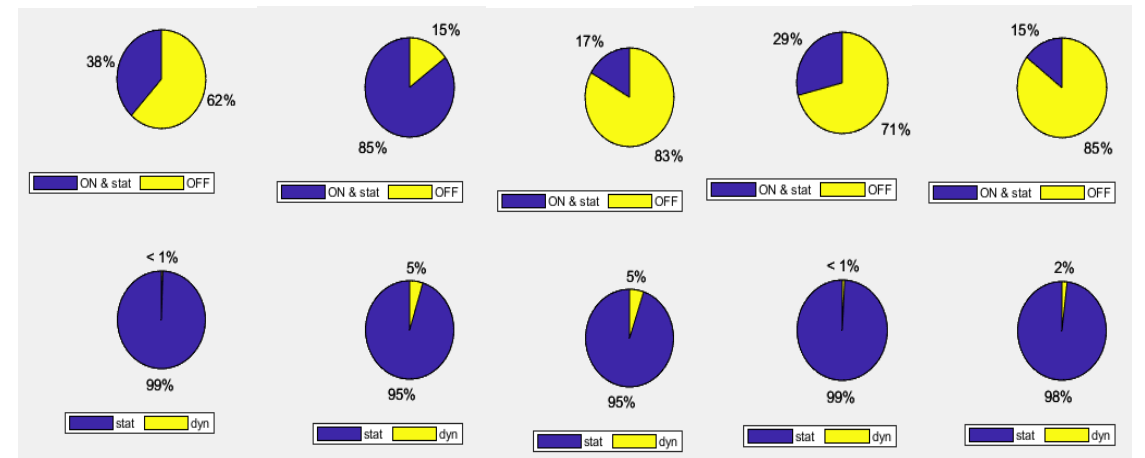
Classification

ON – OFF

quasi stationary - dynamic



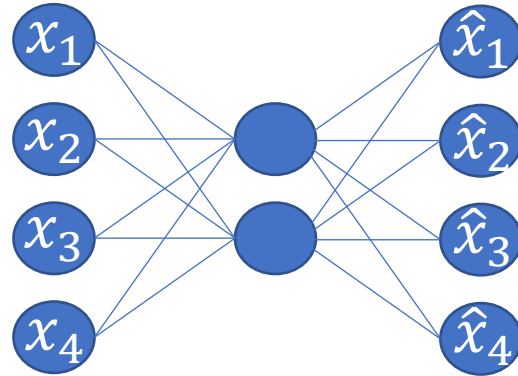
Operating states of five identical machines



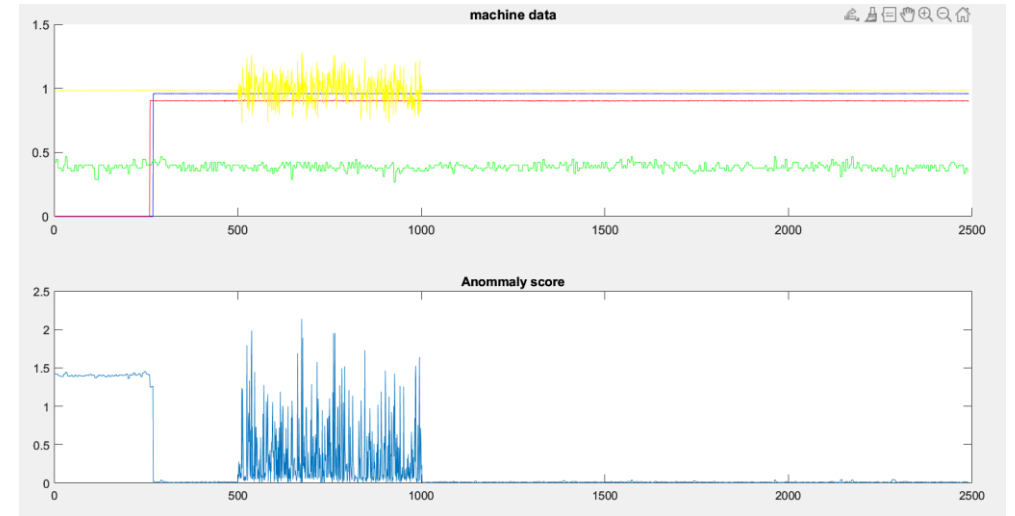
Monitoring Applications examples



Anomaly Detection



LSTM neuronal network

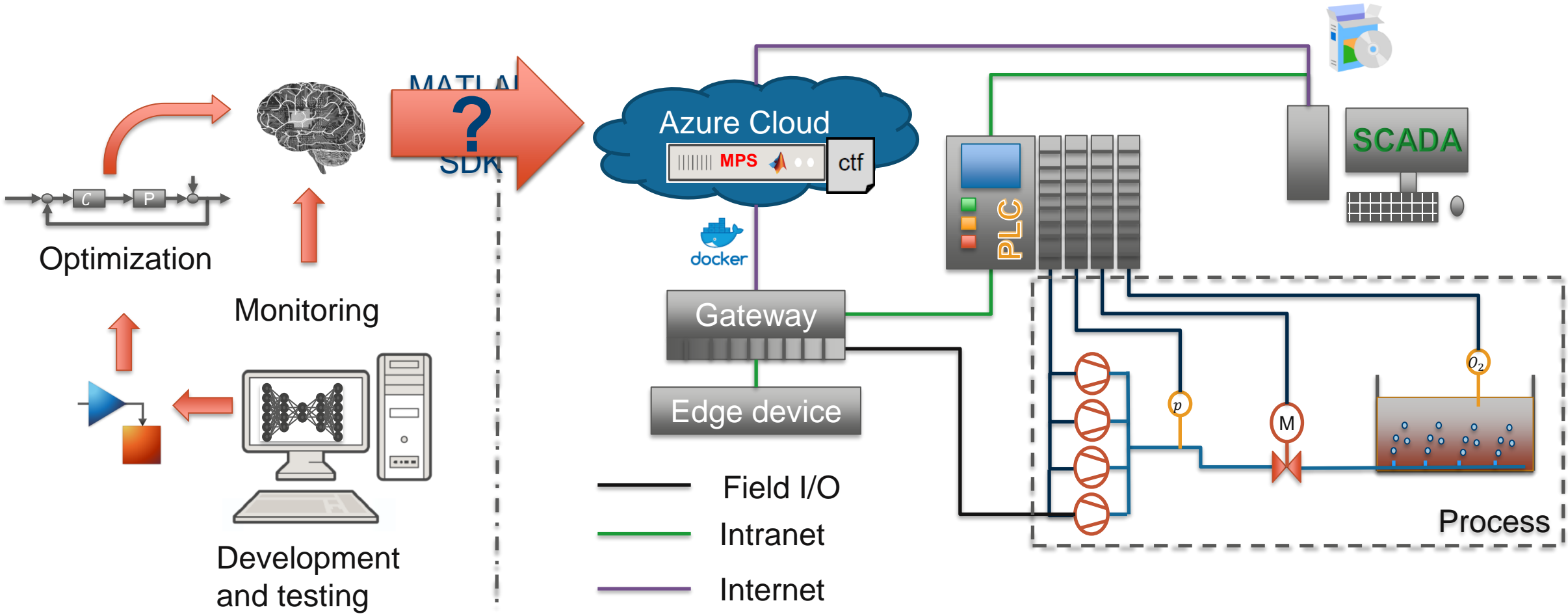


- Discharge temperature
- Intake/discharge pressure
- Rotary speed

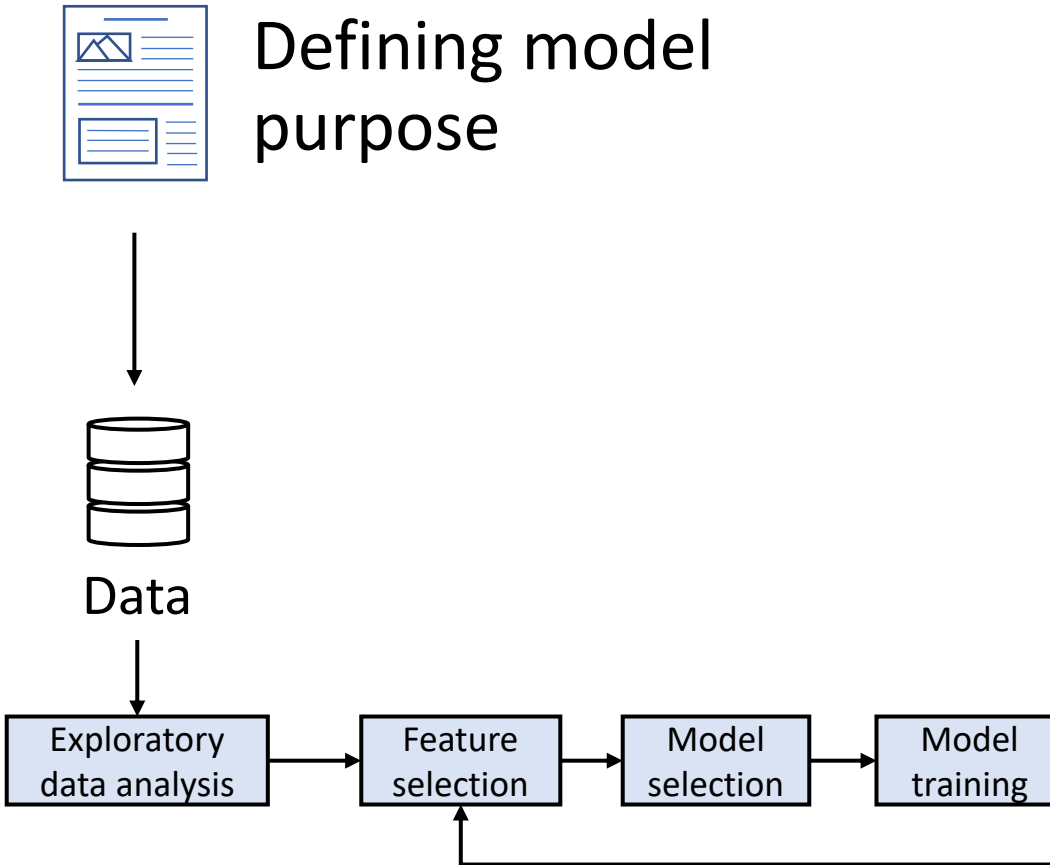


Visualization & Alarming

How to get Monitoring & Optimization to the plant?

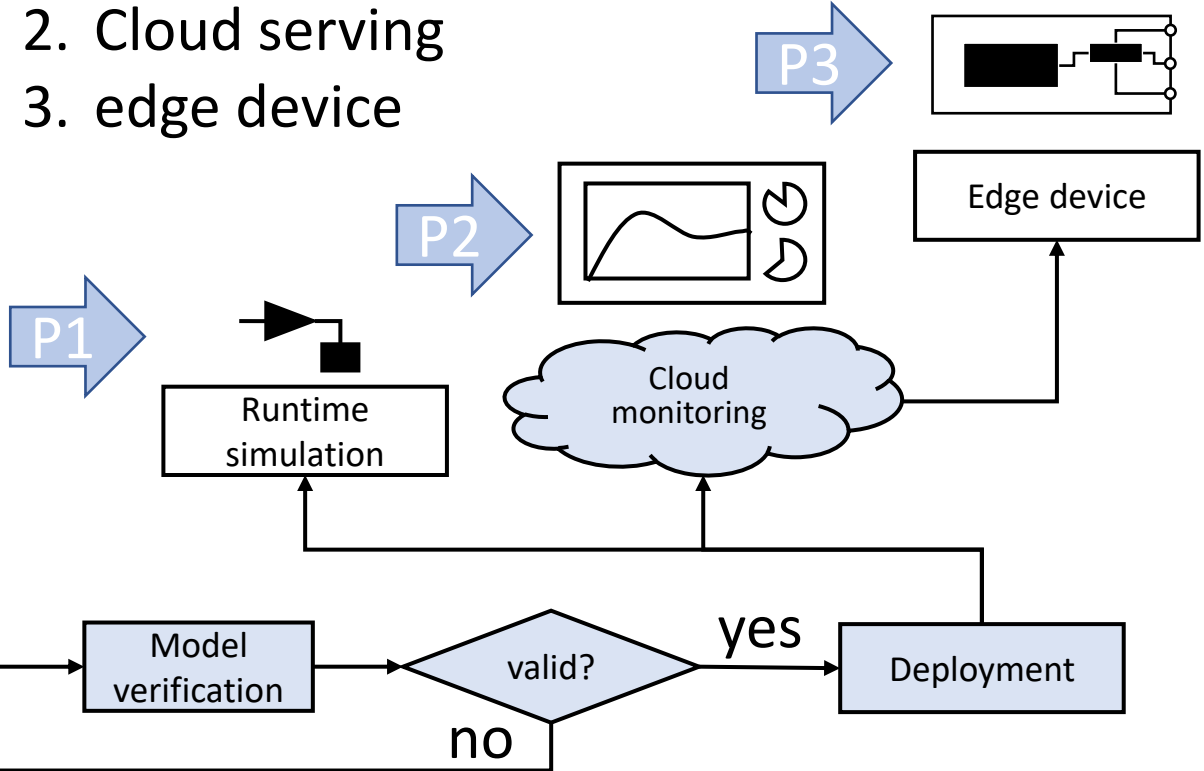


Model Development

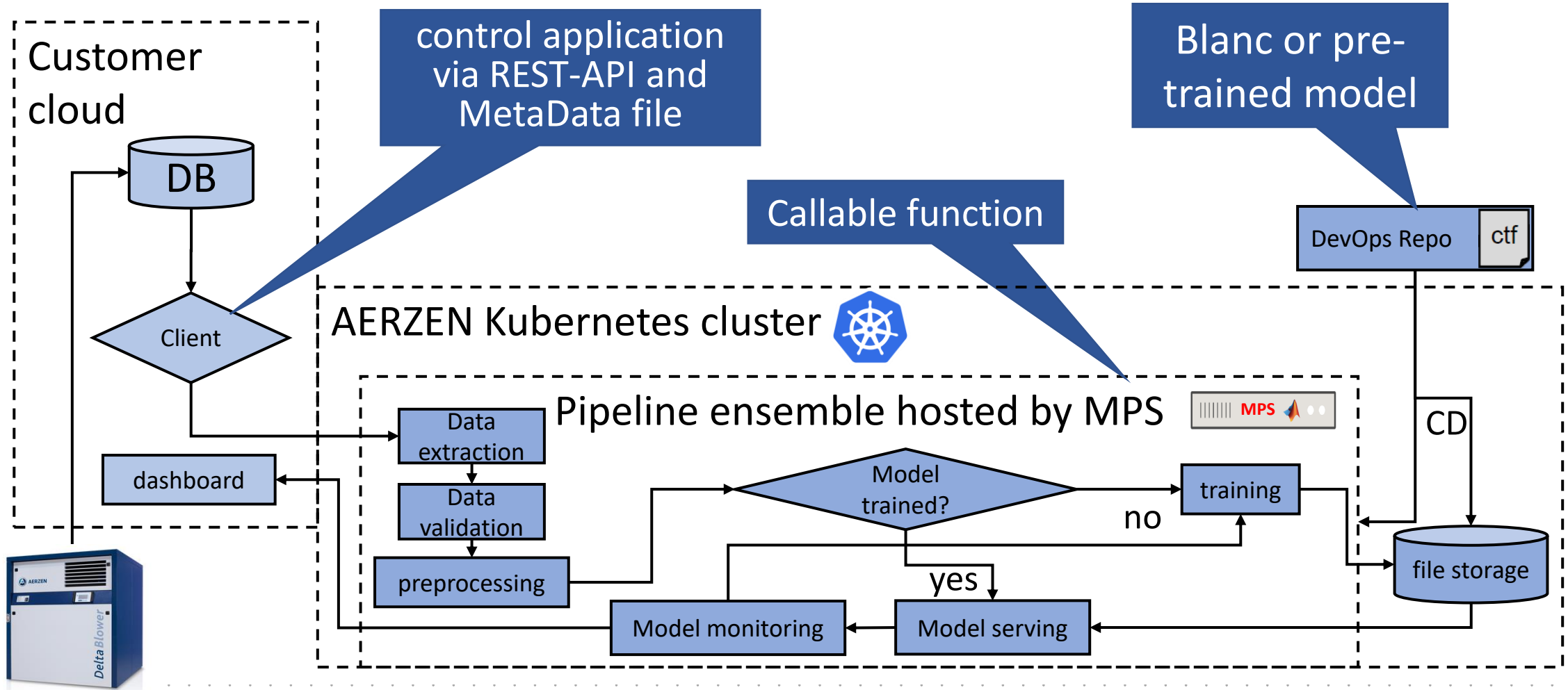


Deployment Phases

- 1. Runtime simulation system
- 2. Cloud serving
- 3. edge device



Model runtime serving



Application Organization (Autoencoder)



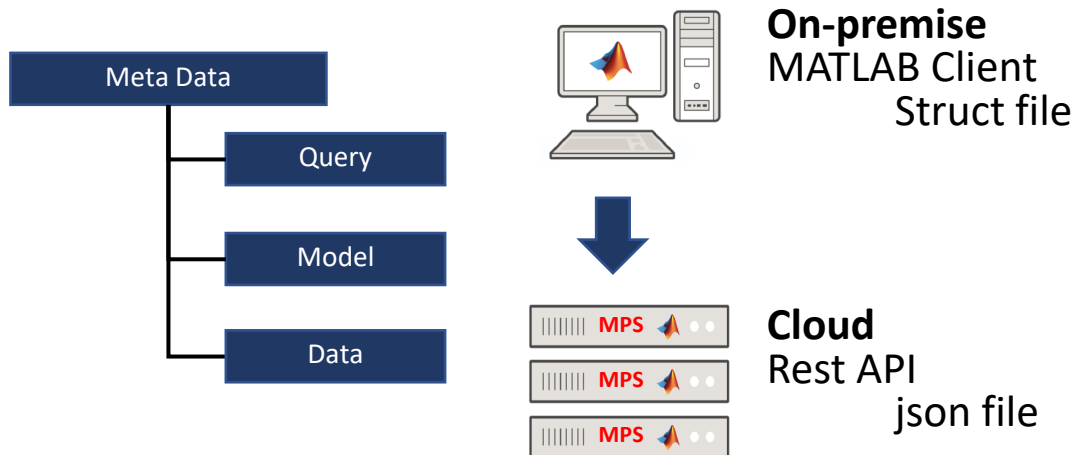
Access and configuration of an application via MetaData file

Layers:

Application

Ensemble

Data processing



MatlabClient.m

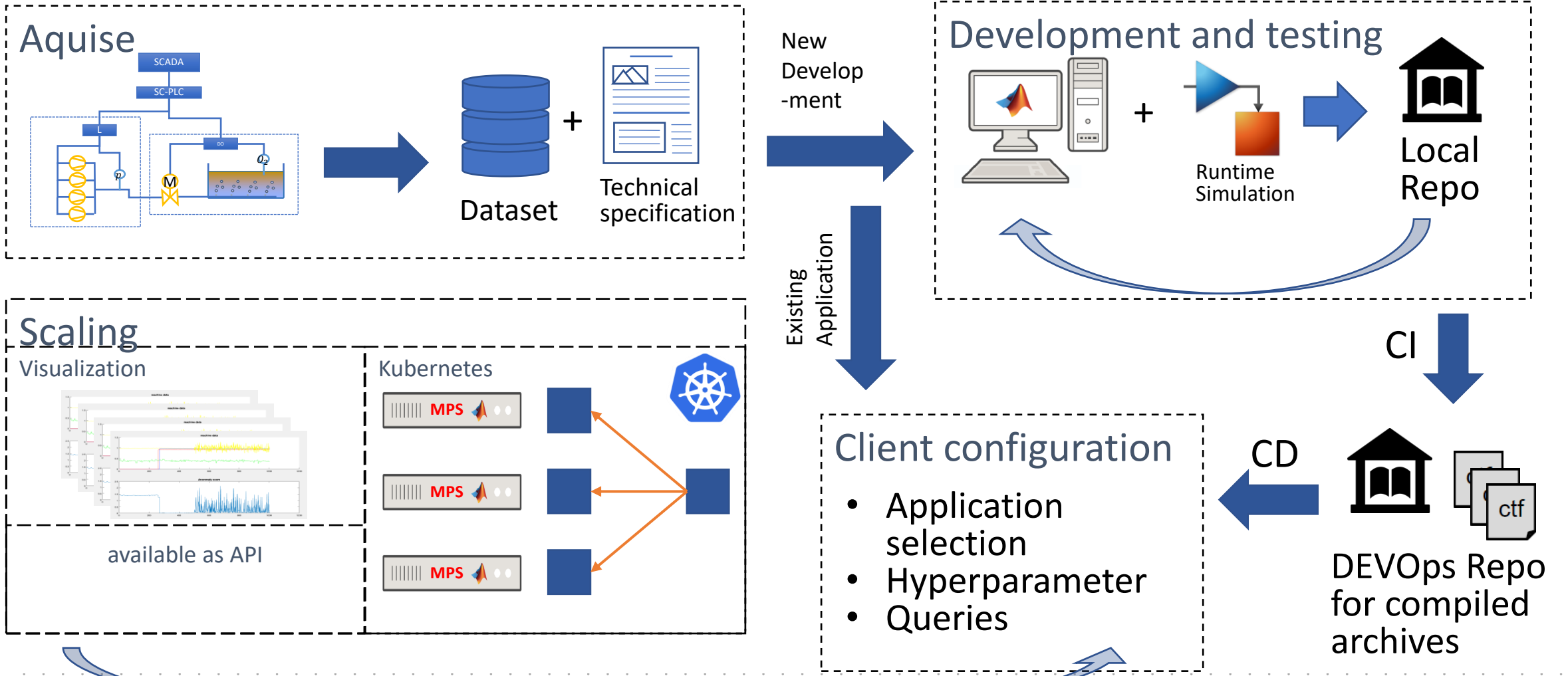
AE_AllInOne.m

On-premise
MATLAB Client
Struct file

Cloud
Rest API
json file



Business model



Conclusion



Pros

- Minimum two experts can operate the system
- Code is protected via archive
- Integrable in 3rd party systems
- Lifecycle can be tested and simulated before deployment
- One framework for different deployment destinations

Cons

- Functions take about 25 - 50 % more time to create
- Need scaling to be cost-effective
- Productivity increases by reusing components

Further development targets



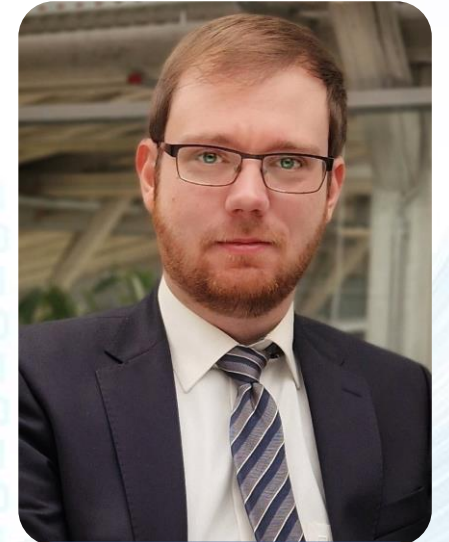
AERZEN

Compressed air, gas
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1. Expand library
2. Deployment to edge device via cloud
3. Integrate SIMULINK models on MATLAB Production Server
4. Automated model selection

Automated digital twin creation
and deployment

Accelerate monitoring & optimization



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