ODS AI

Advanced Predictive maintenance using AI

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Statement of purpose
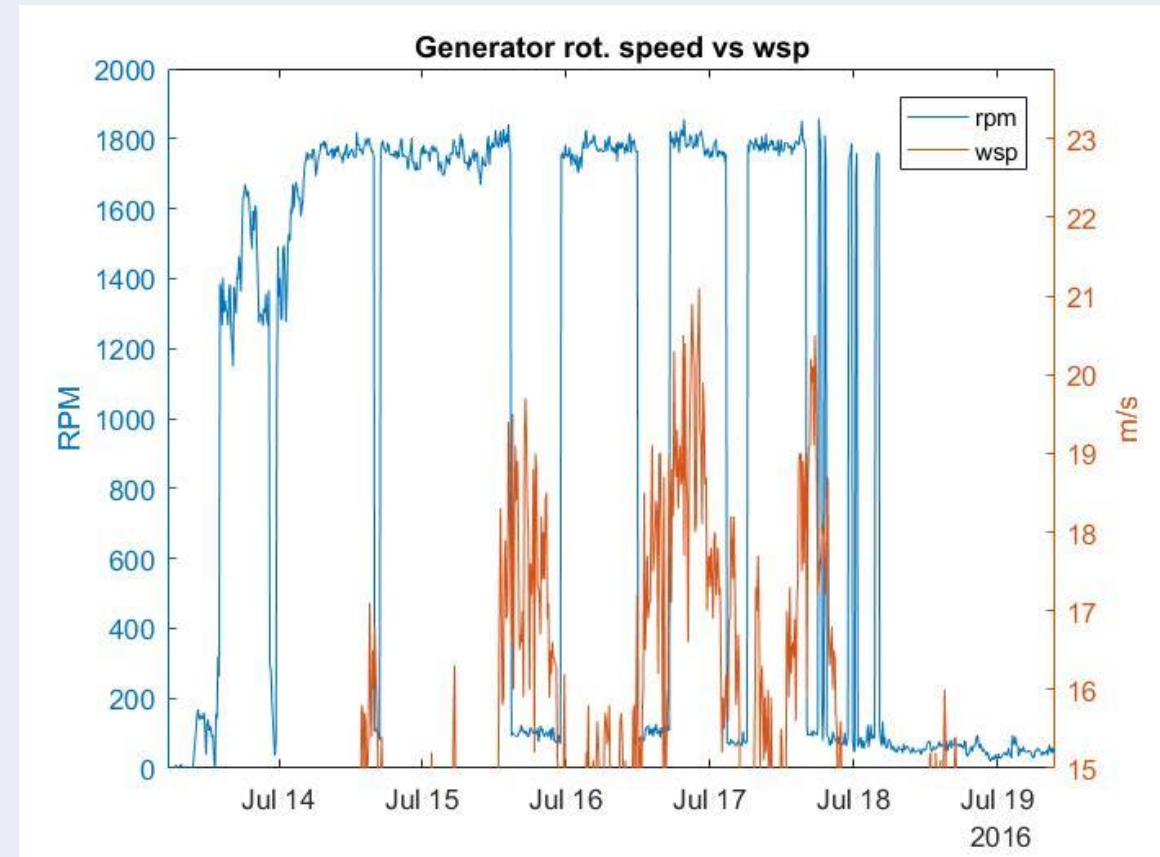
Task: maintenance cost reduction

Solution: Predictive maintenance

Technology: neural network

**Output:** plotted fault predictions

Data analysis

- Important: choose correct input variables for each component. Also from other turbines

- Visual inspection

- Some failures are unpredictable. E.g. short-circuits
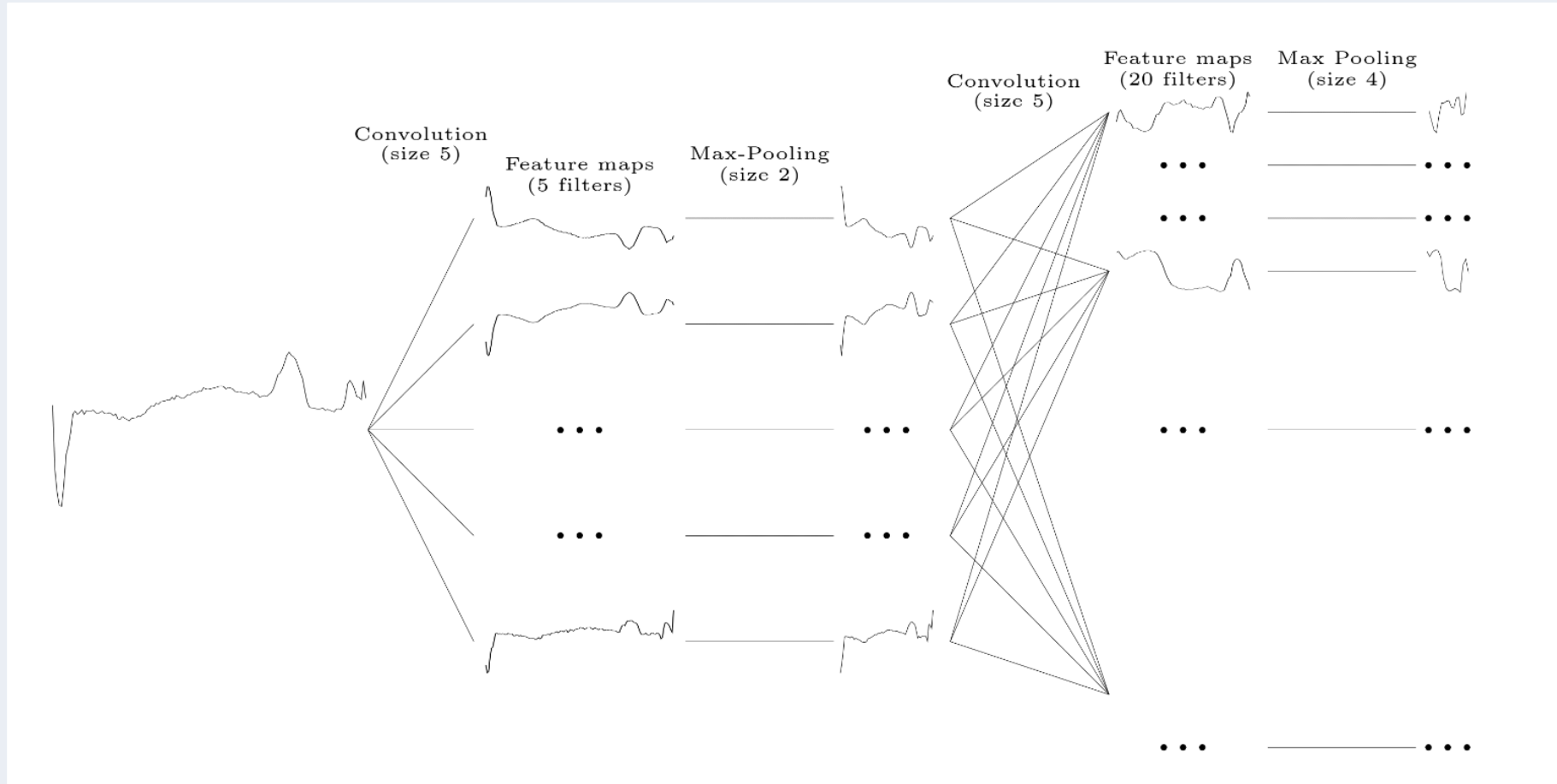

Generator rot. speed vs wsp

3

Data processing

- All presented data combined;

- Missing values are filled with by interpolation of neighbors

- Each feature normalized within given turbine

- Feature engineering.

One dimensional convolutional neural network (D1 CNN)
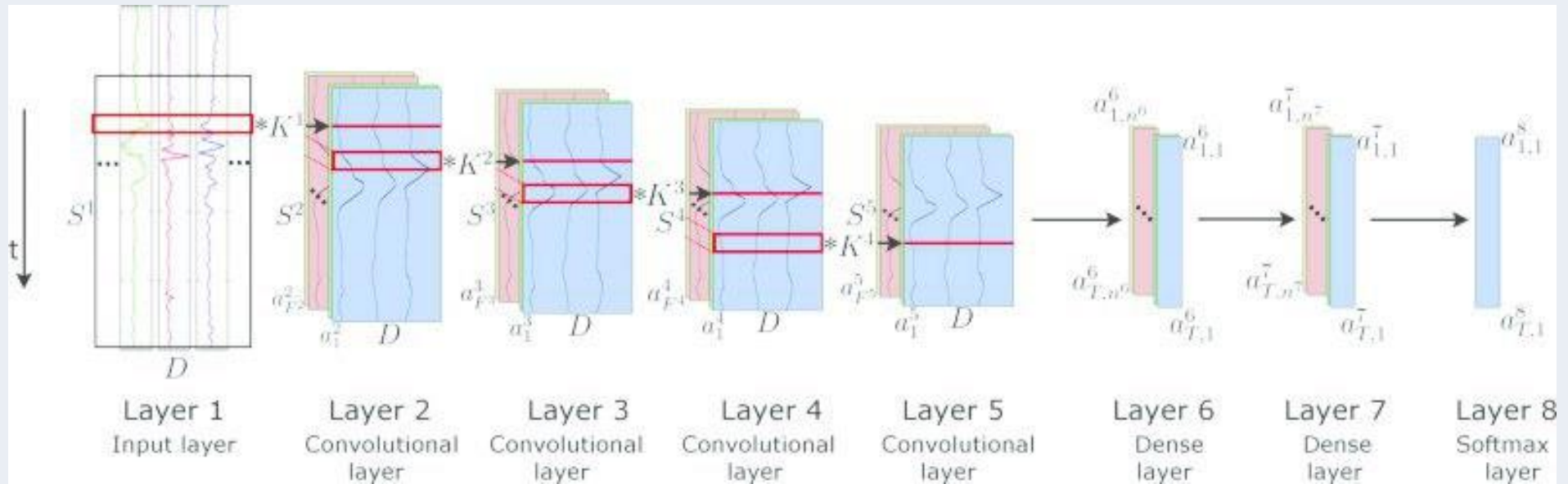
Overcoming limited data amount - data augmentation

References

- Francisco Javier Ordonez and Daniel Roggen. "Deep Convolutional and LSTM Recurrent Neural Networks for Multimodal Wearable Activity Recognition". (2016)

- Nijat Mehdiyev, Johannes Lahann, Andreas Emrich, David Enke, Peter Fettke, Peter Loos. "Time Series Classification using Deep Learning for Process Planning: A Case from the Process Industry". (2017)

- Simon Malinowski, Romain Tavenard. "Data Augmentation for Time Series Classification using Convolutional Neural Networks Arthur Le Guennec". (2016)

Results

Prediction savings: 34506.7 €

Total grade: 11.8

Gearbox: 16.9

Generator: 14.5

Generator Bearing: 0.0

Transformer: 9.4

Hydraulic Group: 13.2

Thank you for the attention!