ICNAP Hackathon Task 4

Task Description

ICNAP Hackathon, 25-27 October 2019
IconPro GmbH

Predictive Quality Management

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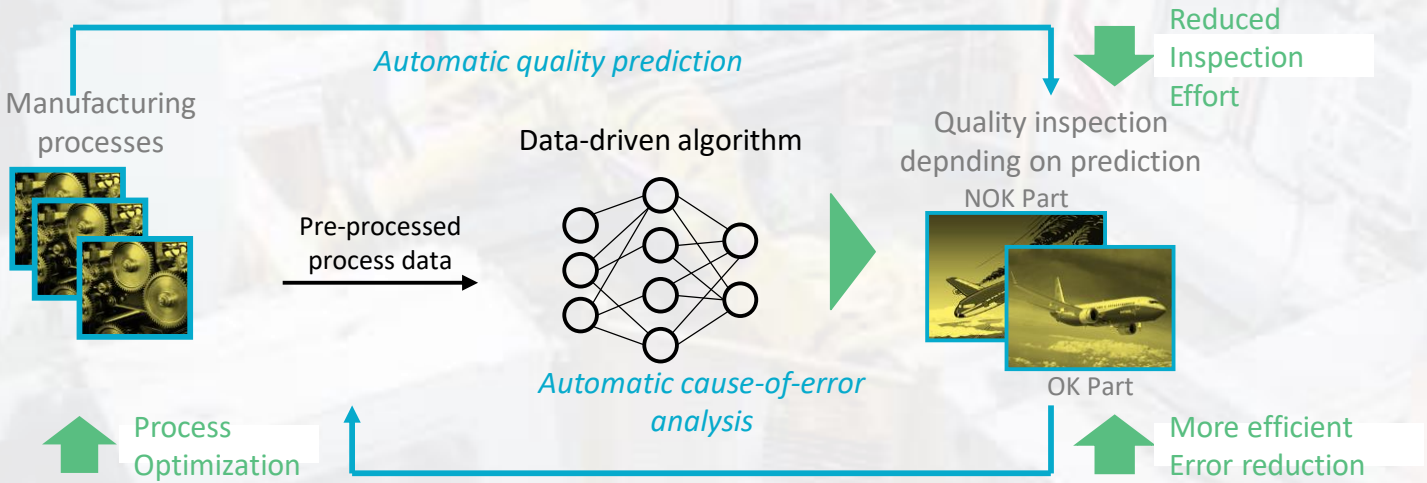
Normal inspection until the training of the neural network is completed, …

… then quality prediction using process data.



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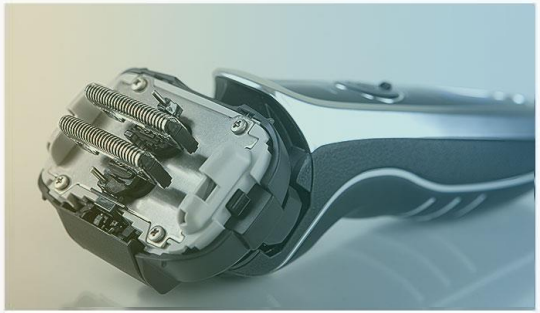
Predictive Quality Management: Exemplary Projects

SERIES PRODUCTION OF ENGINE COMPONENTS

Reduction of the effort required for testing rotationally symmetrical parts

- ✓ Quality prediction
- ✓ Sampling dynamics



MANUFACTURE OF RAZOR BLADES

Quality-oriented optimization of the etching process

- ✓ Quality prediction
- ✓ Process optimisation

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Hackathon Task 4 Description - Everything will be good in the end!?

Description of Overall Goal & Task	What if you could predict the quality of the parts in production already during production? Then, you would only have to measure the parts that are predicted to be critical or you can improve your processes, or you could just skip the quality checks at the end. This would save resources, time and money. Try to get out the most of the data we will provide to you and predict the quality of the underlying parts! The structured data consists of columns representing input parameters and columns representing output parameters. Try to predict the output parameters based on the input parameters by regression and/or classification analyses!
Sub-Tasks	• Pre-process the given data (different files representing different processes with different inputs and outputs) • Implement different approaches (e.g. decision trees, gradient boosted trees, neural networks) to predict the outputs • Study the accuracy of the best approaches for each given data set / output • Still not enough? Can you make use of automated machine learning libraries (e.g. Auto-Keras, Auto-Sklearn)? • Present you approach and results (e.g. confusion matrices or R^2 values per discrete / continuous output, analysis and data set)
Further Info	▪ The data sets (different time periods) can be found in the files PredQuality_Data1.xlsx and PredQuality_Data2.xlsx ▪ There are three different analyses. The definition of inputs and outputs for the data can be found in Readme.txt ▪ Exemplary results from us for PredQuality_Data1.xlsx can be found in PredQuality_Exemplary Reference Results.pdf ▪ Please use Python. The rest is up to you. Tools / libraries that we used can be found in tools.txt

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THANKS!

Any questions? You can find me at

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