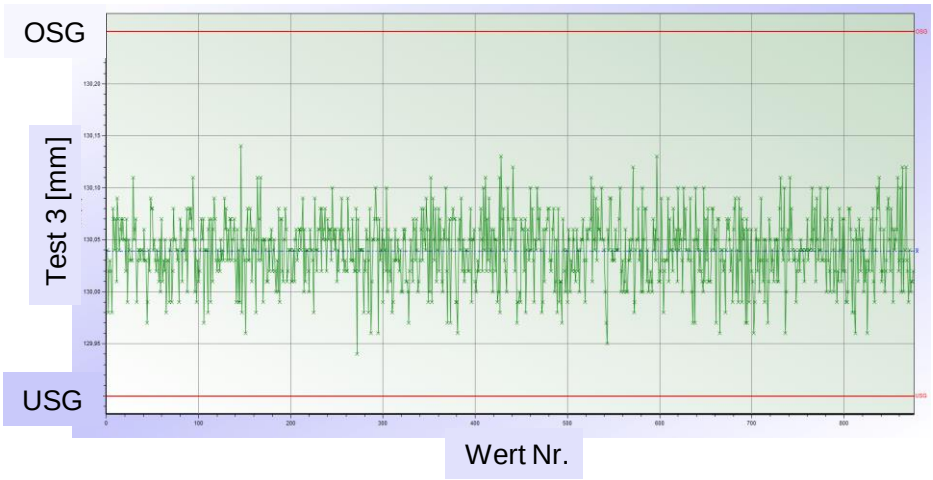
ICNAP Hackathon Task3
Task Description

ICNAP Hackathon, 25-27 October 2019
IconPro GmbH

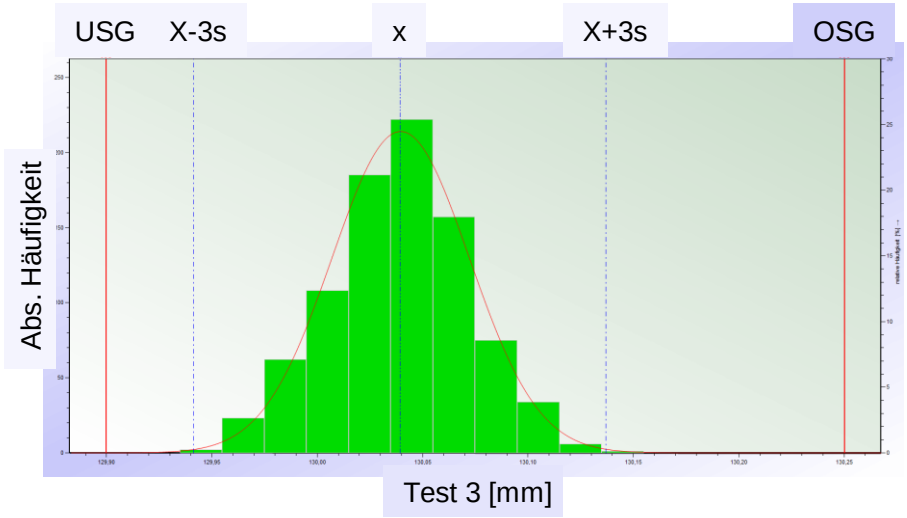
AI-based Process Monitoring

Evaluation of process capabilities

Process chart



Histogram



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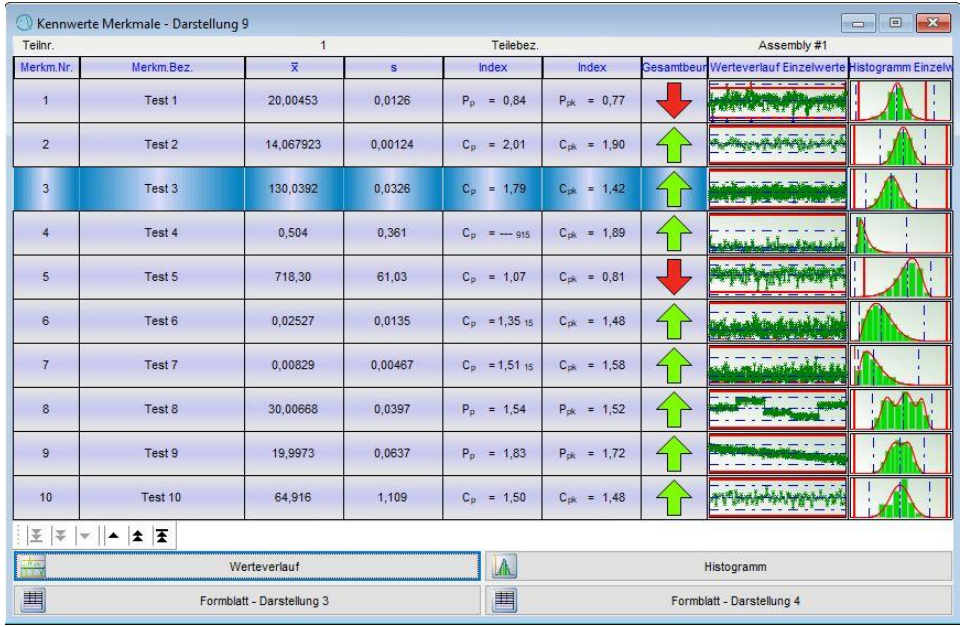
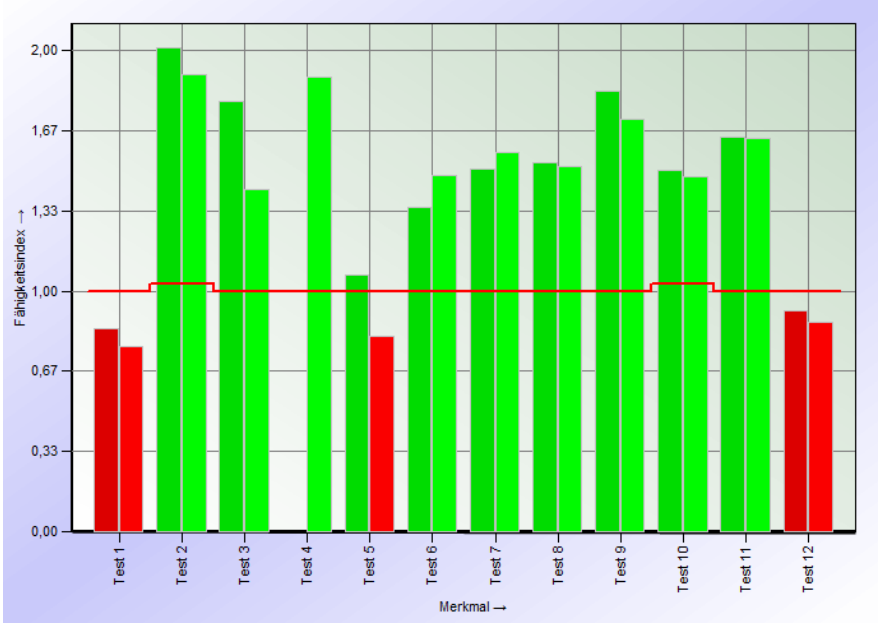
Evaluation of process capabilities

Characteristics – Parameter overview



Characteristics - Capabilities



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Evaluation of process capabilities

Characteristics – Parameter overview

Kennwerte Merkmale - Darstellung 9

Teilnr. 1 Teilebez. Assembly #1

Merkm.Nr.	Merkm.Bez.	$\bar{x}$	s	Index	Index	Gesamtbeur	Werteverlauf Einzelwerte	Histogramm Einzelv
1	Test 1	20,00453	0,0126	P_p = 0,84	P_{pk} = 0,77			
2	Test 2	14,067923	0,00124	C_p = 2,01	C_{pk} = 1,90			
3	Test 3	130,0392	0,0326	C_p = 1,79	C_{pk} = 1,42			
4	Test 4	0,504	0,361	C_p = ---$_{915}$	C_{pk} = 1,89			
5	Test 5	718,30	61,03	C_p = 1,07	C_{pk} = 0,81			
6	Test 6	0,02527	0,0135	C_p = 1,35$_{15}$	C_{pk} = 1,48			
7	Test 7	0,00829	0,00467	C_p = 1,51$_{15}$	C_{pk} = 1,58			
8	Test 8	30,00668	0,0397	P_p = 1,54	P_{pk} = 1,52			
9	Test 9	19,9973	0,0637	P_p = 1,83	P_{pk} = 1,72			
10	Test 10	64,916	1,109	C_p = 1,50	C_{pk} = 1,48			

Werteverlauf | Histogramm

Formblatt - Darstellung 3 | Formblatt - Darstellung 4

Mixed Distribution

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Task 3 – Mixed Distribution Analysis

Goal	• To have central intelligence in production for monitoring and analyzing process parameters automatically • This hackathon task specifically limit to Mixed distributions • Train a Machine Learning model which classifies the mixed distributions into different types
Things Provided	• Labelled data sets showing values of process parameters over time – *iconpro_mn*, *iconpro_mnrw* • Three types of Labels – type, number of components, underlying distribution
What do we expect ? Task	• Use of coding Language – Python (preferable), but open to C++, R • Use of ML algorithms – Neural Networks, SVM, Expectation Maximization, Bootstrapping etc. • Classify dataset *iconpro_mn* based on distribution type • Classify dataset *iconpro_mn* based on number of components • Identify jumps, outliers and trends along a curve of process parameter values over time
Bonus Task	• Classify dataset *iconpro_mnrw* based on - *type, components, underlying distribution*
Report	• Architecture of model used/Algorithm approach • Metrics – Accuracy, Confusion Matrices, any other metrics on test Dataset • Qualitative Analysis (*Optional*)

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