AFRY

A component digital twin for process engineering plants

Predicting Crystallization Outcomes and Optimizing Yield Quality through Advanced Data Modeling and Sensitivity Analysis.

INDUSTRIAL DATA ANALYTICS

This is the process of collecting, analyzing and using plant data to harness the hidden value. Tools like e-DAP are capable of modelling a physical phenomenon on the basis of data collected over time. The insight gained helps improve operational efficiency, optimize process, and plan maintenance ahead of time.

SITUATION & CHALLENGE

— The challenge is to predict the particle distribution at each batch-phase of the crystallization process ahead of time, and thus the quality of the yield.

— The case explores the effect on the yield of changing the raw material properties.

SERVICE & APPROACH

— Legacy data was collected, ingested, and engineered (feature selection, windowing, PCA, etc.).

— The right ML algorithm was chosen for predictive modeling, including a dedicated sensitivity analysis tool.

— The model powered the 'Component Digital Twin (CDT)' predicting the raw material's crystallization process.

— CDT forecasted particle distribution at each batch phase, influencing yield quality, among other KPIs.

— The platform was utilized for asset management, with focus on production control.

E-DAP: the *end-to-end* data platform

A cloud-hosted infrastructure for the treatment of plant data: from IoT sensing, through engineering, dashboarding, ML/AI, digital twinning, to insight

IMPACT & ADDED VALUE

— The client now has on-line business intelligence tool, for predicting and monitoring the asset's performance.

— The client is capable to control the production on a daily basis and optimize the process for the best outcome (act at the level of the process batch).

— Next step is to transition from a cloud-based to an on-premise solution.
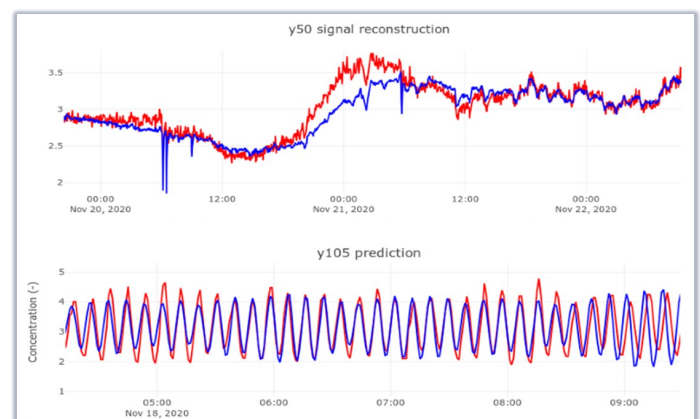
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