

Batch Process Optimizer

Traditional advanced control approaches like MPC do an inadequate job of optimizing KPI's. Model based optimization using dynamic process models (digital twins) are expensive, difficult to implement, time and resource intensive and hard to keep current.

Users are looking for AI based optimization but most of these approaches (like deep learning, reinforcement learning etc.) require substantial amounts of data and require a highly accurate digital twin. As a result of the difficulty and cost of building & deploying optimizers using these techniques makes it impossible to justify the ROI

Quartic has built a revolutionary technique for optimizing batch processes without the need for large amounts of data or the need for dynamic process models. Instead, it uses a proprietary sample-efficient (small data) AI algorithm that learns from data iteratively.

Deployment can be done on three different levels. First, an offline, secure web-based SAAS application allows you to upload the data with CSV's and get set-point recommendations which can be used to run the next batch. The results from the batch run are uploaded and appended to the CSV and a new optimization run recommends the next set of set points.

To increase model confidence and explainability a prediction of the impact of suggested set points along with influencing variables is provided. The prediction can also be used for hypothesis testing before applying the optimization.

Second, you can connect the system to the Quartic platform where data is retrieved automatically, and the set points recommended can be displayed on an HMI/SCADA to the operator. Lastly, with a bi-direction OPC-UA connector it is also possible to run the optimizer in a closed loop mode by writing set-points to the DCS/PLC directly.

Benefits and Outcomes

- ✓ Optimize any batch unit operation and build a multi-unit optimizer.
- ✓ Optimization results can be achieved in as little as 10 batch runs
- ✓ Simple deployment results in accelerated ROI

Differentiators

- ✓ Large amounts of historical data sets are not required
- ✓ No programming, coding or data science is required
- ✓ You can optimize single or multiple KPIs under any number of constraints.
- ✓ No software needs to be installed
- ✓ Do not need a process model (digital twin)

