



Filling plant error detection

This use case shows the deployment of Anominer for on-line monitoring of a filling plant. It is shown that Anominer detects changes and disturbances during the filling process immediately.

Anominer does not employ any semantics, such as knowledge about the filling process or physical context. Anominer works strictly on measurement data that characterizes the filling process.

Typical errors in filling plants include - besides contamination - blockage or plugging, leakage at multiple components, and pump malfunctions. These errors have various impact on sensor measurements, from which one can directly or indirectly conclude on the error.

In this use case the filling plant is monitored by multiple sensors. Monitored values include fill level, mass flow, and valve states. In the upper part „Input data“ of the figure, data from five sensors is illustrated, which serve as input data to Anominer. A periodic behavior of the data with a period length of about 300 seconds can be recognized.

Process

During the learning phase, multiple cycles of the filling process are employed to learn the model of the normal behavior. Here, Anominer generates a learned model that describes the dependencies over time and between all five input variables. After that, Anominer processes the input data during the evaluation phase with its algorithm for anomaly detection.

Result

During evaluation phase, disturbances are inserted into the filling process. These disturbances change the input data in the following way:

- Decrease in sensor 2 (orange) at second 690
- Increase in sensor 3 (yellow) at second 820
- Absence of increase in sensor 4 (purple) at second 1150

The lower part of the figure depicts the processing result of Anominer, the anomaly indicator. It can be seen that Anominer reliably detects all three disturbances.

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