Experiment Description

This experiment uses the SV4 campaign pressure curve data and analyses it for possible use of predictive maintenance.

Pressure curve raw data is denoised, adequatly cut (due to differnt length of pressure curve recordings) and some dimension reduction is done with PCA.

A first experiment then tries to determine a linear prediction model of the run number (=cycle number) within an experiment based on the first 10 principal components. If the predicted run number correlates with the actual run number, it would be an indication that a change in pressure curves over time happens. So, for each experiment and fluidic path such a correlation number is computed, and a boxplot is obtained for each fluidic path.

timestamp

Experiment run: 19-Mar-2018 14:54:16 on machine: HSE-NB-045

Data

There are 49 sets of data, one set per experiment. Each experiment consists of a couple of hundred runs (also called cycles) where in each run 9 pressure curves are recored for the 9 fluidic paths.

The data is loaded from the csv-files 'PressureDataFluidPath0x.csv', where $x = 1, ..., 9$. Each of these files are located within the experiment directory.

Furthermore, there is a 'DataExport.csv'-file in each experiment directory. This file is an exported result from the EventLog-Analyzer based on the 'EventLog.txt'-file.

Data was extracted once by the file 'grabData.m' which loads all the full file paths for the PressureDataFluidPath0x.csv files and the DataExport.csv-files, parses them and puts the data in Matlab tables, described below. Tables are stored in 'ExperimentData.mat'. Additionally, due to the long extraction process of pressure data, 'PressureGroup.mat' is created containing the raw data for tblFP.

Matlab data storage

- tblFP contains all the pressure curve data and is indexed by 'expRun', 'FC', 'FcRun', 'FP' and 'FpRun', corresponding to experiment run number, flowcell, flowcell sequence number, fluidic path number and fluidic path run (= cycle number). This is the main data table for the first pressure curve analysis and contains the addtional attributes 'startDateTime', 'timeVec', 'dataVec' and 'Experiment', latter is the experiment directory. 'timeVec and 'dataVec' describe the pressure curves. Note: pressure curves are sampled at 50Hz but may be of different length.
- tblDataExport which contains all attributes and values that are common on all experiments and are extracted from the DataExport.csv-files.

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