Multiview Fault Analysis on High-dimensional Time-series Data

Fault analysis on high-dimensional time-series data have rapidly emerged in the past decades. All these analyses try to detect when the anomalous patterns appear and what are the driven causes behind.

One example is the Cyber-Physical System (CPS) which is typically e- quipped with a large number of networked sensors that keep recording the running status of the local components; anoth- er example is the large scale Information Systems such as the cloud computing facilities in Google, Yahoo! and Amazon, whose composition includes thousands of components that vary from operating systems, application softwares, servers, to storage, networking devices, etc.

In fault detection systems, massive amount of data gathered from the life-cycle of equipment is often used to learn models or classifiers that aims at diagnosing different kind of errors or failures.

Feature selection for time series data

Perhaps you could start with some large general model (AR with exogenous regressors and their lags) and use regularization (LASSO, ridge regression, elastic net). Meanwhile, PCA assumes independent observations so its use in a time series context is a bit "illegal". A dynamic factor model (Pena & Poncela "Nonstationary dynamic factor analysis" (2006)) could be a PCA counterpart for time series but it may be difficult to estimate (Kalman filter would be slow for a large system)

<https://github.com/blue-yonder/tsfresh>

<http://tsfresh.readthedocs.io/en/latest/api/tsfresh.feature_extraction.html>

Anomaly detection in time series of graph using fusion of graph invariants

