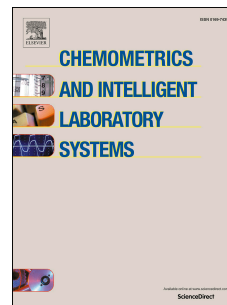


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A Modified Moving Window Dynamic PCA with Fuzzy Logic Filter and Application to Fault Detection

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Abstract

Principal Component Analysis (PCA) model is constructed from measured data and used to monitor new testing samples. In fact, the statistical independency assumption between observations is true only for long sampling intervals. Nowadays, industrial systems are sophisticated and fast for which this assumption becomes no longer valid and the current observation becomes highly dependent on the past observations. In another hand, Dynamic PCA (DPCA) is a PCA extension to deal with the aforementioned problem, but monitoring process using this method with fixed control limits showed a high False Alarms Rate (FAR), high Missed Detection Rate (MDR) and long Detection Time Delay (DTD). In this paper, a Modified Moving Window DPCA (MMW-DPCA) with Fuzzy Logic Filter (FLF) is proposed to address the above issue. The developed monitoring scheme continually updates control

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