

Use of In-line Data Analytics and Empirical Model for Early Fault Detection

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Abstract : Automatic process monitoring schemes are designed to give early warnings for unusual process events or abnormalities as soon as possible. For this end, various techniques have been developed and utilized in various industrial processes. It includes multivariate statistical methods, representation skills in reduced spaces, kernel-based nonlinear techniques, etc. This work presents a nonlinear empirical monitoring scheme for batch type production processes with incomplete process measurement data. While normal operation data are easy to get, unusual fault data occurs infrequently and thus are difficult to collect. In this work, noise filtering steps are added in order to enhance monitoring performance by eliminating irrelevant information of the data. The performance of the monitoring scheme was demonstrated using batch process data. The results showed that the monitoring performance was improved significantly in terms of detection success rate of process fault.

Keywords : batch process, monitoring, measurement, kernel method

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