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Timely Detection and Identification of Abnormalities for Process Monitoring

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Abstract : The detection and identification of multivariate manufacturing processes are quite important in order to maintain good product quality. Unusual behaviors or events encountered during its operation can have a serious impact on the process and product quality. Thus they should be detected and identified as soon as possible. This paper focused on the efficient representation of process measurement data in detecting and identifying abnormalities. This qualitative method is effective in representing fault patterns of process data. In addition, it is quite sensitive to measurement noise so that reliable outcomes can be obtained. To evaluate its performance a simulation process was utilized, and the effect of adopting linear and nonlinear methods in the detection and identification was tested with different simulation data. It has shown that the use of a nonlinear technique produced more satisfactory and more robust results for the simulation data sets. This monitoring framework can help operating personnel to detect the occurrence of process abnormalities and identify their assignable causes in an on-line or real-time basis.

Keywords : detection, monitoring, identification, measurement data, multivariate techniques
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