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XAI for signal diagnosis in SPM

Artificial Intelligence (AI) has shown become very popular as modelling strategy within statistical process monitoring (SPM), particularly in detecting abnormal process behaviours. However, for existing AI-based SPM methods, diagnosing features associated with signal remains challenging, as traditional diagnosis methods are not directly applicable. This lack of diagnosis makes it difficult to make an out-of-control action plan and take appropriate actions once a signal is detected, and thus impedes the AI-based SPM methods from being applied in practice. Explainable AI (XAI) offers a promising framework for addressing this limitation by providing feature relevance information for the model outputs, which can help identify the features related to abnormal process behaviour. This work proposes a general framework for combining XAI with AI-based monitoring. Simulation studies and a real-world case study show the effectiveness of the proposed method.

Special/ Invited session

Classification

Mainly methodology

Keywords

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