A New Hybrid Approach for Fault Detection and Diagnosis

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Résumé en anglais	Fault detection and isolation based on hybrid approaches have been an active eld of research over the last few years. From a practical point of view, the development of generic and uni ed approaches for industrial supervision systems design is a key challenge. The main methodological contribution of the present work is to develop a hybrid approach properly tailored for such challenge. The proposed approach uses the Bond Graph formalism to systematically develop computational models and algorithms for robust fault detection and isolation. The resulting outcomes are extended to a proposed data-driven approach which consists of transforming historical process data into a meaningful alphabetical model incorporated within a Bayesian network. This new hybrid methodology bene ts from all the knowledge available on the system and provides a more comprehensive solution in order to increase the overall con dence in the diagnosis and the performances. The e ectiveness of the developed hybrid approach is validated by the well-known Tennessee Eastman Benchmark process.
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