
Remove wAste Before Automation (RABA) : the Graph-based Anomaly Detection (GAD) Model

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Résumé

A key principle of the digital transformation of industries is ‘Remove wAste Before Automation’ – what we call the RABA approach: in a digital factory, processes must first be optimized before they can be digitalised efficiently. In this paper, we define a graph-based model for detecting wastes in digital systems under the form of anomalies: the GAD (Graph-based Anomaly Detection) model. GAD defines a three-step process: extraction of system behaviour as graph from system logs, evaluation of anomalies, and user-driven investigation. It bases on a two-fold data model built of Concrete Anomaly Scenario Graphs (CASGs) and Abstract Anomaly Scenario Graphs (AASGs). CASGs represent the actual behaviour of the system. AASG represent known behaviours, being either acceptable or abnormal. The GAD model aims at addressing one key challenge of research on the Factory of the Future: the availability of versatile models that are able to cover a broad range of applicative domains and technologies. The applicability of GAD wrt. to representative issues in Factory of the Future: production monitoring, predictive maintenance, IT infrastructure, service monitoring; is therefore evaluated.

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