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# Enhancing Fault Prediction in Nuclear Industry: Hybridization of Knowledge- and Data-Driven Techniques

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## Résumé

The nuclear industry, renowned for its exceptional reliability, derives significant advantages from its comprehensive feedback mechanisms and robust maintenance management systems. The emergence of the Industrial Internet of Things, heralding the fourth technological revolution, has enabled the integration of Artificial Intelligence (AI) techniques within this sector. This integration aims to significantly improve the prediction of failures in critical processes. However, the success of these AI techniques critically depends on the precision of the input data in accurately representing the physical phenomena that lead to failures. In light of this, our paper presents a novel framework for predicting faults in nuclear processes. This method combines data-driven techniques with domain-specific knowledge and expertise to enhance prediction accuracy. We apply this approach to a specific process within the nuclear industry, and our findings demonstrate the framework's effectiveness in accurately predicting failures.

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