

AI Techniques for Process Faults Detection and Diagnosis

Process monitoring is important in modern industries due to their complexity, increased safety requirements and product quality demands. A fault in a process can be defined as the deviation of a variable from an acceptable operational range.

Faults detection and diagnosis (FDD) is crucial in manufacturing complex processes to improve productivity and quality and to decrease production costs. With the emergence and the development of intelligent systems, FDD should be achieved automatically by processing data that are gathered in real time for a dynamic process monitoring.

AI techniques are commonly used approaches to detect and diagnose faults (Sorsa et al. 1993; Bakshi et al. 1998; Xu et al. 2019). For example, Principle component analysis (PCA) and statistical pattern classifiers are commonly used statistical approaches. Neural network (NN) and support vector machines (SVM) are also commonly used. These techniques can extract features from highly correlated-high dimensional data to detect and diagnose the fault.

The main objective of the project is to investigate AI techniques for process faults detection and diagnosis and then the development of a hybrid data-driven methodology for steel manufacturing process monitoring.

Keywords: Process monitoring; AI, faults detection and diagnosis

Internship details: the internship will take place in the LCFC laboratory of ENSAM Metz.

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References:

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