Special Issue

Intelligent Fault Diagnosis and Predictive Process Monitoring

Message from the Guest Editors

As industrial systems grow more complex, automated, and connected, ensuring their reliability and safety becomes critical. Fault diagnosis and predictive monitoring are essential for early anomaly detection, root cause analysis, and failure forecasting, particularly in sectors like energy, manufacturing, transportation, and infrastructure. Recent advances in AI, signal processing, and hybrid modeling have enabled intelligent systems that learn from data to improve robustness and adaptability. Despite progress, challenges remain—such as noisy environments, limited data, and cross-domain model transfer. This Special Issue invites original research, reviews, and case studies on intelligent techniques for fault diagnosis and predictive monitoring. Topics include health indicators, degradation models, RUL estimation, anomaly detection, digital twins, hybrid models, and explainability frameworks. Contributions that combine data-driven methods with physical knowledge or validate solutions across domains are especially welcome.

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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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