Special Session on:
Predictive maintenance for intelligent manufacturing systems

Manufacturing systems are moving towards intelligence and automation. Meanwhile, it also puts more stringent requirements on the maintenance decisions of manufacturing systems. Compared with traditional preventive maintenance, predictive maintenance is based on historical observation data and state evolution laws to predict the future state degradation trend or remaining useful life, which is used as the basis for maintenance decisions of intelligent manufacturing systems. The emergence of artificial intelligence technologies such as machine learning and deep learning have accelerated the development of predictive maintenance.

However, the complex degradation mechanism of manufacturing equipment, the dynamic and variable operating environment, and the multiple dependence among intelligent manufacturing systems make it difficult for the existing predictive maintenance method to take into account both accuracy and promptness. Therefore, this special session aims to focus on how to construct degradation models to describe the health state evolution process, and then achieve accurate health state or remaining useful life prediction, by using physical, statistical or intelligent models with multi-source monitoring data from equipment, production and operational environment. On this basis, how to use deep learning, reinforcement learning and other technologies to achieve online dynamic decision-making for maintenance plans, as well as rapid adjustment methods for maintenance plans in response to unexpected events such as sudden breakdowns and changes in production schedules.

This special session will introduce the latest insights and original research from relevant scholars for researchers, engineers and other attendees in the field of predictive maintenance, and promote exchange and collaboration among scholars. Topics include, but are not limited to, the following:

Multi-source data fusion for intelligent manufacturing systems

Condition monitoring and fault prognostics

Degradation modeling and remaining useful life prediction

Predictive maintenance modeling and decision-making

Intelligent maintenance optimization algorithms

Predictive maintenance design and applications

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