Special Issue

Deep Learning and Predictive Maintenance in Industrial Applications

Message from the Guest Editors

This Special Issue focuses on how deep learning methods, such as convolutional neural networks, recurrent architectures, or transformer-based models, can drive progress in predictive maintenance by enabling robust representations of complex, high-dimensional industrial data. We invite original contributions that explore deep learning approaches for key tasks in predictive maintenance, including early fault detection, remaining useful life estimation, anomaly detection, and the development of adaptive maintenance strategies. Particular emphasis is placed on real-world applications in manufacturing, energy systems, and critical infrastructure. In addition to application-driven research, we welcome submissions that address theoretical and methodological advances in the context of predictive maintenance. This includes research on interpretable and robust deep models for time series and sensor data, data-efficient learning strategies such as transfer or few-shot learning, and approaches to multimodal sensor fusion or image-based diagnostics. Furthermore, contributions that reflect on the challenges of deploying such models in complex industrial environments are particularly encouraged.

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Message from the Editor-in-Chief

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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