



applied sciences



Special Issue Reprint

Industrial AI

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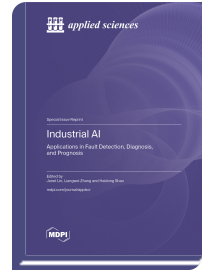
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This Reprint showcases recent advances in the application of artificial intelligence (AI) to fault detection, diagnosis, and prognosis, with a focus on enhancing reliability, efficiency, and decision-making in industrial systems. In the era of Industry 4.0, the convergence of machine learning, deep learning, and hybrid modeling has transformed traditional maintenance strategies, enabling predictive and autonomous capabilities in cyber-physical systems. The 18 selected contributions span a diverse set of industrial domains, including photovoltaic systems, wind turbines, electric vehicles, bearings, railways, elevators, and wastewater treatment. Methods range from generative adversarial networks, reinforcement learning, and transfer learning to multi-objective optimization, signal processing, and knowledge distillation. Common themes include tackling data imbalance, improving model interpretability, enabling cross-domain adaptability, and supporting edge computing. This Reprint reflects the collective effort of researchers addressing current challenges and underexplored areas in Prognostics and Health Management (PHM). It provides both theoretical innovations and practical solutions for industrial AI applications, offering valuable insights for researchers, engineers, and decision-makers committed to building resilient, intelligent, and sustainable systems.



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