Special Issue

Digitalization of Nuclear Power Plant Asset Management Using Artificial Intelligence and Machine Learning Methods

Message from the Guest Editors

The aim of this Special Issue is to promote, collect and share recent research in AI and ML advancements, including both methodological and practical research for the digitalization of nuclear systems, ranging from modeling and simulation, control, prediction, detection, diagnostics and prognostics, to reliability decision-making and risk assessment. The topics of interest include, but are not limited to, the following:

- Digital twins and digital-twin-enabling technologies for the modelling and simulation of NPP;
- AI/ML methods for prognostics and health management of NPP components and systems;
- AI/ML methods for structural health management of NPP assets;
- AI/ML methods for resilience assessment and enhancement of NPP;
- Reinforcement learning for maintenance decision-making in NPP;
- Explainability/interpretability of AI/ML methods for NPP applications;
- Risk-informed system health and asset management;
- Risk-informed condition-based predictive maintenance;
- AI/ML methods for domain adaptation;
- Other relevant AI and ML approaches for the digitalization of NPP.

Guest Editors

Prof. Dr. Enrico Zio

1. Centre de Recherce sur les Risques et les Crises (CRC), MINES Paris-PSL Université, 06904 Paris, France
2. Energy Department, Politecnico di Milano, Via La Masa 34, 20156 Milano, Italy

Dr. Ibrahim Ahmed

Energy Department, Politecnico di Milano, Via La Masa 34, 20156 Milano, Italy

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Editor-in-Chief

Prof. Dr. Enrico Sciubba
Department of Mechanical and Industrial Engineering, University Niccolò Cusano, 00166 Roma, Italy

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