Special Issue

AI-Driven Intelligent Maintenance and Health Management for Complex Industrial Systems

Message from the Guest Editors

Safe, efficient, and intelligent operation of complex industrial systems is vital for sustainable development in energy, rail, aerospace, manufacturing, and intelligent equipment sectors. These systems feature strong coupling, time-varying conditions, and diverse failure modes, making traditional maintenance strategies inadequate for modern reliability and cost demands. Advances in sensing, data acquisition, AI, edge computing, digital twins, and foundation models have revolutionized prognostics and health management (PHM), enabling early fault detection, remaining useful life (RUL) prediction, and adaptive maintenance. Explainable AI further enhances system transparency and trust. This Special Issue invites original research and reviews on AI-enabled PHM innovations and applications, including but not limited to:

- Multi-source heterogeneous data fusion
- Anomaly detection, fault diagnosis, RUL prediction
- AI–digital twin integration for health management
- Hybrid physics-based and data-driven modeling
- Explainable AI and foundation models for monitoring
- Applications in energy, transportation, aerospace, and manufacturing

We look forward to your contributions.

Guest Editors

Dr. Dandan Peng

Dr. Xiaoxi Hu

Dr. Jipu Li

Prof. Dr. Chuanjiang Li

Deadline for manuscript submissions

28 February 2026

Machines

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 4.7

mdpi.com/si/245675

Machines
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
machines@mdpi.com

mdpi.com/journal/machines

Machines

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 4.7

mdpi.com/journal/machines

About the Journal

Message from the Editor-in-Chief

Machines is an international, peer reviewed journal on machinery and engineering. It publishes research articles, reviews and communications.
Our aim is to encourage scientists to publish their experimental and theoretical results in as much detail as possible. There is no restriction on the length of the papers. Full experimental and/or methodical details must be provided.
There are, in addition, unique features of this journal: Manuscripts regarding research proposals and research ideas will be particularly welcomed; Electronic files or software regarding the full details of the calculation and experimental procedure - if unable to be published in a normal way can be deposited as supplementary material.

Editor-in-Chief

Prof. Dr. Antonio J. Marques Cardoso
CISE - Electromechatronic Systems Research Centre, University of Beira Interior, Calçada Fonte do Lameiro, P-6201-001 Covilhã, Portugal

Author Benefits

High Visibility:

indexed within Scopus, SCIE (Web of Science), Inspec, and other databases.

Journal Rank:

JCR - Q2 (Engineering, Mechanical) / CiteScore - Q1 (Control and Optimization)

Rapid Publication:

manuscripts are peer-reviewed and a first decision is provided to authors approximately 16.9 days after submission; acceptance to publication is undertaken in 2.4 days (median values for papers published in this journal in the first half of 2025).