# Special Issue

# Multi-Physics Modeling, Optimization and Control of High-Performance Electric Machines

## Message from the Guest Editor

The transition toward electrified transportation and advanced automation has created a strong demand for electric drives that deliver high efficiency, power density, and reliability. Designing such systems requires comprehensive multi-physics modeling that captures the coupled electromagnetic, thermal, mechanical, and acoustic phenomena, as well as their interaction with power electronics and control algorithms. Advances in numerical simulation, optimization techniques, and digital twins now enable co-design and performance evaluation across domains, paving the way for intelligent, data-driven machine drive systems.

This Special Issue aims to bring together recent developments in multi-physics analysis, design optimization, and the control of electric machines and drives. We welcome contributions on analytical and computational modeling, co-simulation environments, electromagnetic–thermal coupling, vibration and noise mitigation, converter–machine co-design, and advanced control strategies. Papers addressing AI-based optimization, digital twin frameworks, fault-tolerant operation, and integrated power electronics for high-performance applications are especially encouraged.

## Guest Editor

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## Deadline for manuscript submissions

30 June 2026

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# 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
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