Special Issue

Design, Control and Application of Precision Robots

Message from the Guest Editor

Precision robots integrate mechanics, control theory and AI to achieve micro/nano accuracy in complex environments. Their advanced design combines high-rigidity structures with flexible mechanisms for monolithic integration, complemented by encoders and vision sensors to minimize positioning errors. Control algorithms—from classical PID to adaptive neural networks—enable real-time compensation for dynamic disturbances. Applications include semiconductor wafer handling, robotic surgery and satellite assembly, where precision and reliability are critical. Recent advancements feature hybrid learning control frameworks and digital twin integration for predictive maintenance. Driven by Industry 4.0 demands, these robots are evolving toward human–robot collaboration with enhanced force/torque sensing. The field continues to advance in multi-objective optimization, fault-tolerant control and energy-efficient actuation.

Guest Editor

Dr. Beichao Shi

Key Laboratory of Mechanism Theory and Equipment Design of Ministry of Education, School of Mechanical Engineering, Tianjin University, Tianjin 300354, China

Deadline for manuscript submissions

30 April 2026

Machines

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 4.7

mdpi.com/si/252394

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).