Special Issue

Intelligent Path Planning for Robotic Systems: Modeling, Optimization and Real-Time Decision-Making

Message from the Guest Editors

Optimization algorithms are pivotal in enabling robots to achieve autonomy in complex, dynamic environments. While traditional methods often fail to address scalability and real-time demands, emerging techniques—from metaheuristics (PSO, GA, ACO) to combinatorial optimization and reinforcement learning—are revolutionizing robotic path planning. However, their practical deployment requires tight integration with environmental perception, robust decision-making under uncertainty, and computationally efficient execution. This Special Issue focuses on algorithmic innovation and system-level implementation for robotic path planning, emphasizing three interconnected pillars:

- Modeling and Optimization
- Real-Time Planning and Decision-Making
- Environmental Intelligence for Planning

We seek contributions that

- Propose novel algorithms with theoretical rigor and practical validation (simulation + hardware);
- Address real-world challenges, such as sensor noise, computation/communication bottlenecks, safety-critical constraints;
- Demonstrate applications in autonomous vehicles, agile robots, search-and-rescue, or other latency-sensitive domains.

Guest Editors

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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

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 17.6 days after submission; acceptance to publication is undertaken in 2.7 days (median values for papers published in this journal in the second half of 2025).

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