Special Issue

Applications of Mathematical Methods in Robotic Systems

Message from the Guest Editors

Robotic systems are increasingly used in dynamic, human-centered environments that require mobility, adaptability, and intelligent interaction. Key challenges include controlling complex manipulators, modeling soft and bioinspired structures, coordinating robot fleets, and ensuring safe human-robot collaboration. Mobile manipulators, combining mobility with dexterous manipulation, demand precise modeling, perception, and planning. This Special Issue focuses on applying advanced mathematical methods throughout the lifecycle of robotic systems—modeling, simulation, optimization, control, and deployment. It emphasizes workflows integrating simulation, real-time deployment via ROS, and digital twin frameworks for predictive modeling and adaptive control. Big data from sensor-rich environments supports learning-based control and continuous refinement of robot behavior. We invite contributions demonstrating mathematically rigorous approaches to mobile manipulation, soft robotics, fleet coordination, learning-based control, and human-robot interaction, highlighting the role of mathematics in enabling reliable, intelligent robotic systems.

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Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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