Special Issue

Symmetry and Learning-Based Control Algorithms in Robotics and Mechatronic Systems

Message from the Guest Editors

The increasing integration of intelligent control systems and learning algorithms in robotics and mechatronics has revolutionized modern automation. This transformation is particularly evident in areas such as autonomous systems, collaborative robotics, and human–robot interactions. Symmetry and asymmetry, whether in robot structure, task planning, or control strategies, play a crucial role in optimizing system performance, robustness, and adaptability. This Special Issue aims to collect high-quality original research and review articles addressing the theoretical and practical aspects of advanced control and learning approaches in robotic and mechatronic systems. Topics of interest include symmetry analysis in kinematics and dynamics, model-free and model-based learning, real-time motion planning, adaptive control, and applications in mobile, aerial, and assistive robotics. We encourage contributions that present novel insights into system design, control architectures, and algorithmic approaches that leverage symmetry or challenge conventional symmetric assumptions for better performance.

Guest Editors

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About the Journal

Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

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