

## Special Issue

# Latest Advancements in Symmetry and Asymmetry in Robotics and Mechatronics: Highlighting Emerging Trends and Their Intersections with Artificial Intelligence (AI), Machine Learning, Nonlinear Systems, and Control

### Message from the Guest Editors

Symmetry and asymmetry are fundamental principles in the natural sciences, shaping various aspects of scientific inquiry. In robotics and mechatronics, these concepts play a crucial role in design, control, and functionality. Symmetry, characterized by balanced and identical features in a robot's structure or behavior, enhances stability, efficiency, and predictability. For instance, humanoid robots often feature symmetrical limbs to better mimic human movement. On the other hand, asymmetry introduces variations that improve adaptability and specialized performance. Many robotic designs intentionally incorporate asymmetry to optimize functions such as gripping objects of diverse shapes or navigating uneven terrain.

This Special Issue aims to showcase the latest advancements in symmetry and asymmetry in robotics and mechatronics, highlighting emerging trends and their intersections with artificial intelligence (AI), machine learning, and nonlinear systems.

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### Guest Editors

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Prof. Dr. Jose Manoel Balthazar

Prof. Dr. Angelo Marcelo Tuset

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## Symmetry

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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.

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### Editor-in-Chief

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