# Special Issue

# Applications Based on Symmetry/Asymmetry in Optimization Algorithms

## Message from the Guest Editors

Symmetry often underlies hidden redundancies that inflate search spaces and degenerate gradients, while asymmetry frequently encodes the real-world imbalance that intelligent algorithms must cope with. This Special Issue welcomes original contributions that discover, quantify, or break symmetry and those that deliberately introduce beneficial asymmetry into optimization algorithms. We focus on advanced evolutionary and swarm intelligence methods (genetic algorithms, differential evolution, ant colony, particle swarm, estimation of distribution, and memetic frameworks), gradient-based and hybrid learning systems, and their deployment in machine learning tasks—especially computer vision problems such as symmetric/asymmetric object detection, equivariant network design, imbalance-aware classification, and neural architecture search. Review articles that offer systematic comparisons or unveil new benchmark suites are also encouraged. By gathering high-quality theoretical analyses, novel algorithmic designs, and real-world vision applications, this Special Issue aims to provide a comprehensive snapshot of how symmetry and asymmetry can be exploited to enhance convergence speed ...

## Guest Editors


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## Deadline for manuscript submissions

31 December 2026


# Symmetry

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 5.2

mdpi.com/si/263728

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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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