Special Issue

Symmetry and Asymmetry in Big Data Analytics

Message from the Guest Editors

The concept of symmetry is a key organising principle in many scientific fields, supporting mathematical formalisation, computational modelling and the organisation of complex systems. In big data analytics, properties such as invariance, structural regularity and self-similarity contribute to the development of efficient algorithms and scalable architectures. However, asymmetry—manifested through heterogeneity, skewed distributions, causal dependencies and informational imbalances—characterises many modern digital ecosystems and challenges traditional modelling assumptions. This Special Issue explores symmetry and asymmetry as a conceptual axis for advancing large-scale data analysis. Topics include: (i) mathematical foundations of symmetry in data structures, networks and information theory; (ii) metrics of asymmetry and entropy in large-scale data; (iii) analytical architectures and data pipelines that preserve structural invariants; (iv) modelling organisational and behavioural asymmetries in business systems; and (v) implications for data governance, algorithmic fairness and explainability across domains such as finance, healthcare and digital services.

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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