Special Issue

Hybrid Deep Learning and Explainable AI for Symmetry-Aware and Multiscale Medical Image Analysis

Message from the Guest Editors

This Special Issue will advance research on Hybrid Deep Learning and Explainable Artificial Intelligence (XAI) for medical diagnostic imaging, with particular emphasis on symmetry-aware modeling and multiscale computational representations. We welcome contributions that integrate Convolutional Neural Networks (CNNs), Vision Transformers (ViTs), and multiscale, multidimensional, or multiresolution feature extractors to improve classification, segmentation, and anomaly detection tasks. We also encourage studies exploring model-enrichment strategies that incorporate geometric or anatomical symmetries, mirror-aware attention mechanisms, multilevel feature fusion, explainability-driven constraints, or complex network-based descriptors to enhance model performance, robustness, and clinical interpretability. Submissions addressing theoretical formulations, algorithmic innovation, benchmarking frameworks, or real-world clinical deployments will be highly appreciated. Both methodological advances and analytical reviews demonstrating clear scientific novelty, mathematical rigor, and reproducibility are well aligned with the aims of this Special Issue.

Guest Editors

Prof. Dr. Leandro Alves Neves

Prof. Dr. Marcelo Zanchetta do Nascimento

Prof. Dr. Lucas C. Ribas

Dr. Wallace Casaca

Deadline for manuscript submissions

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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.

Editor-in-Chief

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