Special Issue

Mathematical Foundations and Deep Learning Advances in Computer Vision and Image Analysis

Message from the Guest Editor

This Special Issue focuses on the intersection of applied mathematics and deep learning (DL) in advancing computer vision and image analysis. It aims to bridge rigorous theory with impactful applications across domains such as medical imaging, remote sensing, robotics, and multimedia understanding.
Theoretical Contributions may include mathematical modeling of neural architectures (convergence, expressivity, generalization), variational formulations for segmentation, restoration, and registration, non-linear optimization and training dynamics, topological and geometric DL (manifold learning, GNNs, shape analysis), and probabilistic or statistical frameworks for robustness and interpretability.
Applied Contributions may cover multi-modal and multi-scale fusion, explainable AI emphasizing mathematical transparency, hybrid models integrating DL with classical methods (e.g., fuzzy logic, differential equations), and domain-specific applications demonstrating how mathematics informs DL deployment in real-world image analysis.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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