Call for Papers

AI-Powered Biomedical Computation and Flow Visualization: A Special Issue of the Journal of Flow Visualization and Image Processing

Manuscript Submission Deadline: September 30th, 2025

Recommended max paper length: 5000 words; 4–6 figures

Review duration: Approximately 2 months from submission

http://submission.begellhouse.com/usr/login.html?prod_code=journals

The Journal of Flow Visualization and Image Processing (JFVIP), historically focused on fluid dynamics and flow imaging, is expanding its scope to embrace the rapidly growing intersection between biomedical science, machine learning, and data-intensive computational methods. Modern biomedical problems—from high-resolution medical imaging to flow-related physiological processes—generate vast and intricate datasets. These demand innovative techniques for visualization, analysis, and interpretation. By integrating flow visualization principles with machine learning, numerical simulation, and computational biology, researchers are uncovering new pathways for diagnostics, therapy optimization, and scientific discovery. Furthermore, domain-knowledge-driven medical image analysis could also be a crucial aspect of modern biomedical fields.

In this context, we are pleased to announce a special journal issue on AI-Powered Biomedical Computation and Flow Visualization. This special issue seeks contributions from academia, industry, and governmental research laboratories on original research that utilizes data-driven, AI-assisted, and algorithmically robust approaches to address complex biomedical and visualization challenges and comprehensive survey papers that critically review recent developments and emerging trends in the application of AI to biomedical image processing, flow visualization, and related fields.

Scope and Objectives

This special issue aims to foster cross-disciplinary research at the interface of biomedical engineering, artificial intelligence, and numerical visualization. We welcome studies that

propose novel methodologies, reveal insights through advanced data exploration, or demonstrate impactful applications in real-world biomedical contexts, particularly those leveraging deep learning and neural network technologies.

Topics of Interest (include, but are not limited to):

- Machine learning and deep learning methods for biomedical imaging and diagnosis
- Visualization of blood flow, respiratory patterns, tumor perfusion, Diffusion Tensor Imaging (DTI), and other physiological fluid systems from experiments and simulations, with an emphasis on data analysis
- High-dimensional data analysis in neuroscience and cardiovascular imaging
- Feature extraction and image segmentation using AI and evolutionary computation
- Optimization methods for diagnostic workflows and medical decision-making
- Data-driven modeling and analysis of biological systems
- Explainable AI in biomedical imaging and healthcare diagnostics
- AI-powered and AI-assisted visualization of data derived from computational fluid dynamics (CFD) simulations and numerical weather prediction (NWP) models, encompassing wind and air flows, ocean currents, combustion phenomena, and related processes
- Domain-knowledge-driven medical image analysis

Submissions will undergo rigorous peer review. Papers will be selected based on their originality, contributions, technical clarity and presentation, language, significance to the readership of the journal, relevance to the special issue, and quality and significance of research hypotheses, assertions, and conclusions.

Guest Editors:

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