Special Issue

Physics-Informed Machine Learning: Methodologies and Applications

Message from the Guest Editors

This Special Issue explores the rapidly growing field of physics-informed machine learning (PiML), which integrates machine learning techniques with physical laws and domain knowledge to advance scientific computing and modeling. By incorporating governing equations such as partial differential equations (PDEs) into the learning process, PiML provides powerful tools to address forward and inverse problems, improve accuracy and generalization, and reduce computational costs. This issue features contributions encompassing foundational methodologies—such as physics-informed neural networks (PINNs), operator learning, graph-based approaches, and architecture-imposed conditions—and their diverse applications in areas such as fluid dynamics, structural analysis, material science, and climate modeling. This collection addresses current challenges, including scalability, generalization, and robustness, while highlighting emerging trends and open questions in this transformative field.

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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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