

Special Issue

Graph-Based Machine Learning Techniques

Message from the Guest Editor

We invite submissions to a Special Issue on Graph-Based Machine Learning (GML), focusing on advances that leverage relational structures to learn from complex, interconnected data. Graphs pervade modern data ecosystems—knowledge graphs, molecular and protein interaction networks, transportation and power grids, and social and financial networks—where performance hinges on modeling entities and their relationships. Recent progress in graph neural networks and related methods has unlocked powerful capabilities for reasoning, prediction, and generation, yet key challenges remain in scalability, heterogeneity, dynamics, reliability, and responsible deployment. This Special Issue aims to consolidate cutting-edge theory, methods, systems, and applications that push GML toward practical, trustworthy, and impactful use. Topics of interest include, but are not limited to:

- Novel GNN architectures; self-/semi-supervised, contrastive, and transfer learning on graphs
- Dynamic, temporal, heterogeneous, attributed, and hypergraph learning
- Graph generative models and structure-aware diffusion
- Scalability: billion-edge graphs, streaming/incremental learning, distributed and efficient systems
- among others

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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