IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS)

Special Issue on **Graph Learning**

Introduction

Graphs (or networks) are a powerful data structure. The vast majority of real-world scenarios involve graphs, for instance, social networks, traffic networks, neural networks, biological networks, communication networks, and knowledge graphs, just to name a few. However, classical deep learning and machine learning algorithms cannot be directly applied to many graph-based domains due to the characteristics of graph data that lie in an irregular domain (i.e., non-Euclidean space).

Graph learning (a.k.a. graph machine learning or machine learning on graphs) has attracted huge research attention over the past few years thanks to its great potential. For example, graph learning brings the advantageous and significant ability to exploit the topological structure of graphs. Moreover, graph learning can recursively aggregate information from nodes' neighbours to learn the feature vector of all nodes. The use of graph learning methods, such as graph neural networks, network embedding, representation learning, have led to unprecedented progress in solving many challenges facing real-world applications, such as recommender systems, anomaly detection, smart surveillance, traffic forecasting, disease control and prevention, medical diagnosis, and drug discovery. Despite rapid emergence and significant advancement, the field of graph learning is facing various challenges deriving from, e.g., fundamental theory and models, algorithms and methods, supporting tools and platforms, and real-world deployment and engineering.

This special issue will feature the most recent research results in graph learning. The issue welcomes both theoretical and applied research. It will encourage the effort to share data, advocate gold-standard evaluation among shared data, and promote the exploration of new directions.

Scope of the Special Issue

Topics of interest includes (but not limited to):

- Foundations and principles of graph learning
- Novel machine learning models and algorithms over graphs
- Graph neural networks
- Deep learning on graphs
- Graph mining and analytics
- Network representation learning
- Learning on temporal, large-scale, and/or complex graphs
- Responsible and trustworthy graph learning
- Knowledge-informed graph learning
- Robustness and adversarial attacks on graphs
- Geometric machine learning
- Graph theory and network science for machine learning
- Knowledge graphs
- Graph datasets and benchmarks
- Graph learning systems, platforms, and applications in various domains

Timeline

- Manuscript submission: 1 March 2023
- Preliminary decision: 1 June 2023
- Revisions due: 1 August 2023
- Final decision: 1 October 2023

Guest Editors

- Feng Xia, Federation University Australia, Australia
- Renaud Lambiotte, University of Oxford, United Kingdom
- Neil Shah, Snap Research, USA
- Hanghang Tong, University of Illinois Urbana-Champaign, USA
- Irwin King, The Chinese University of Hong Kong, Hong Kong

Submission Instructions

- Read the Information for Authors at http://cis.ieee.org/tnnls
- Submit your manuscript at the TNNLS webpage (http://mc.manuscriptcentral.com/tnnls) and follow the submission procedure. Include the following instructions in the header of the first page of your manuscript and cover letter: "Please submit the manuscript to the Special Issue on Graph Learning".