CALL FOR PAPERS

IEEE Internet of Things Journal

Special Issue on Graph Representation Learning for Internet of Things

As Internet of Things (IoT) develops into a pervasive ecosystem across diverse scenarios, massive resource-limited devices generate intricate interconnected data, while emerging technologies including reconfigurable intelligent surface (RIS), cell-free massive MIMO (CFmMIMO) and space-air-ground integrated networks (SAGIN) further raise difficulties in IoT resource allocation and secure operation. Machine learning serves as an effective means to optimize IoT communication, yet conventional learning methods struggle to characterize IoT inherent graph topology and capture complex non-Euclidean correlations, making graph representation learning (GRL) including graph neural networks (GNNs) a superior solution for modeling IoT device interactions, data fusion and network management. Current research on GRL-enabled IoT is still immature and lacks systematic exploration of practical IoT constraints, and GRL also acts as a vital enabler for integrating frontier artificial intelligence (AI) technologies to empower AIoT evolution. This special issue thus calls for state-of-the-art GRL-oriented IoT research to summarize latest advances, address unresolved challenges and promote technological progress of intelligent IoT systems.

This Special Issue focuses on the theory, design, implementation, and evaluation of GRL-based techniques for IoT applications, as well as their integration with emerging IoT technologies and next-generation networks.

Topics of interest include, but not limited to:

- Lightweight energy-efficient GRL models tailored for resource-limited IoT devices
- Dynamic GRL algorithms adapting to time-varying IoT network topologies
- Heterogeneous GNNs for multi-modal IoT data fusion and device interaction modeling
- Privacy-preserving federated/distributed GRL schemes for secure IoT collaborative learning
- Explainable GRL techniques for reliable decision-making in critical IoT scenarios
- GRL-based IoT network optimization, resource scheduling and communication overhead reduction
- GRL empowered IoT security defense including anomaly detection and threat identification
- Theoretical research and performance benchmarking of GRL applied to IoT systems
- GRL integration with RIS, pinching antennas, CFmMIMO and SAGIN toward 6G IoT
- GRL-enabled fusion of agentic AI and large language models for intelligent AIoT

Important Dates

- Submission Deadline: November 30th, 2026
- First Review Due: March 1st, 2027
- Revision Due: April 1st, 2027
- Second Reviews Due/Notification: May 15th, 2027
- Final Manuscript Due: May 31st, 2027
- Publication Date: July 2027

Submission

The original manuscripts to be submitted need to follow the guidelines at: https://ieee-iotj.org/wp-content/uploads/2025/02/IEEE-IoTJ-Author-Guidelines.pdf, which should not be concurrently submitted for publication in other venues. Authors should submit their manuscripts through the IEEE Author Portal at: https://ieee.atyponrex.com/journal/iot. The authors must select as "Special Issue on Graph Representation Learning for Internet of Things" when they reach the "Article Type" step in the submission process.

Guest Editors

- Yang Lu, Beijing Jiaotong University (yanglu@bjtu.edu.cn)
- Zhiguo Ding, Nanyang Technological University (Zhiguo.ding@ntu.edu.sg)
- Arumugam Nallanathan, Queen Mary University of London (a.nallanathan@qmul.ac.uk)
- Xianbin Wang, Western University (xianbin.wang@uwo.ca)
- Derrick Wing Kwan Ng, University of New South Wales (w.k.ng@unsw.edu.au)
- Octavia A. Dobre, Memorial University (odobre@mun.ca)