

Call for Papers

IEEE Internet of Things Journal Special Issue on Integration of Generative AI and Internet of Things

In the vast and ever-evolving realm of the Internet of Things (IoT), conventional artificial intelligence (AI) algorithms have played a crucial role in solving complex functions and facilitating complicated decision-making processes. Moreover, AI has also witnessed its potential capabilities in guiding IoT towards more autonomous and efficient systems, as demonstrated by its efficiency in tasks such as big data analysis and interpretation. However, with the arrival of the sixth generation (6G) communications era, marked by ubiquitous connectivity, extremely low latency, and ultrahigh reliability, the future landscape of IoT is undergoing significant changes. In this context, conventional AI models are encountering substantial challenges in adapting to the vast scale and complexity of data, fulfilling the requirements for real-time processing, and maintaining stable performance within the interconnected IoT system.

The emergence of generative artificial intelligence (GAI), as exemplified by models like Generative Pretrained Transformers (GPTs), represents a significant milestone in overcoming the limitations of conventional AI. The models such as GPT-4 are redefining the scope of AI, introducing capabilities for customized data generation and real-time adaptation. This paradigm shift in GAI indicates a potential for mutual enhancement between GAI and IoT. This interaction fosters groundbreaking innovations, where GAI enhances the capabilities of IoT, and IoT enriches GAI, reciprocally. While the integration of GAI and IoT brings promising advancements, it introduces several challenges. From the perspective of GAI-empowering IoT, as IoT devices proliferate and the generated data becomes increasingly complicated, the optimization of GAI algorithms for large-scale data processing becomes challenging. Moreover, ensuring the flexibility of GAI systems to adapt to the dynamic environments within IoT, where the wireless channel, user states, and system resources typically change at varying timescales, complicates efficient and real-time decisions. While for enhancing GAI by IoT, maintaining the relevance and quality of data sourced from IoT devices could be complicated since the data must be representative, unbiased, and comprehensive to enable accurate learning and adaptation by GAI. Furthermore, as GAI integrates with various IoT devices, security and privacy concerns emerge due to the extensive interconnections. Tackling these challenges is essential to facilitate the integration of GAI and future IoT. Accordingly, this special issue is dedicated to offering a platform for researchers from both academia and industry to share the latest research findings and innovative solutions on the integration of GAI and IoT.

The potential topics of this special issue include but are not limited to:

- GAI-assisted Radio Resource Management in IoT
- Network Optimization in IoT through GAI
- GAI-enabled Security Protection and Privacy Preserving in IoT
- GAI-assisted Collaborative Beamforming in IoT
- Mobile Edge Intelligence based on GAI for IoT
- Intelligent Energy Management with GAI for IoT
- GAI for Physical Layer Designs for IoT
- GAI-based Integrated Sensing and Communication for IoT
- Space-Air-Ground Integrated System to Support GAI-based IoT
- GAI-Enabled Semantic Communication in Future IoT
- Distributed Collaborative Learning in Future IoT
- GAI-enabled IoT for Healthcare, Education, and Transportation Applications
- GAI for Incentive Mechanism in IoT
- GAI-empowered Task/Goal-oriented Communications
- Explainable and Safe GAI for IoT
- Testbed and Platform for GAI-Enabled IoT
- IoT to Enhance Security Protection and Privacy Preserving of GAI
- IoT for Data Collection for GAI Applications and Services
- IoT for Interactive GAI
- IoT for GAI-based Metaverse and Digital Twin
- Synergy of GAI and IoT in Mobile Edge Networks
- IoT Platform for GAI

Important Dates:

- Submission Deadline: October 31st, 2024
- First Round Review Decision: December 15th, 2024
- Revision Papers Due: January 15th, 2025
- Acceptance Notification: March 1st, 2025
- Final Manuscript Due: March 15th, 2025
- Publication Date: April 2025

Submission:

All original manuscripts and revisions must be submitted electronically through IEEE Manuscript Central <http://mc.manuscriptcentral.com/iot>. Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at <https://iee-iotj.org/>.

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