IEEE IoT Journal Special Issue: Symbiotic Internet-of-Things for Giant AI in the 6G Era

Incepted by the popularity of ChatGPT, Giant AI models have demonstrated unprecedented capability in handling various language and multimodal tasks. Since giant AI models incurs significant computing and memory costs, it is a common practice to deploy them, for both training and inference, in cloud data centers with vast computing resources. However, such a cloud-centric deployment of giant models often fails to meet the efficiency and security requisites of IoT devices.

Symbiotic Internet-of-Things (IoT) is envisioned as a promising computing paradigm where IoT devices and systems are designed to work in close cooperation with advanced AI models, particularly at the network edge, rather than relying solely on centralized cloud computing resources. This approach seeks to create a mutually beneficial relationship - a symbiosis - between IoT devices, as well as larger computational systems to which they connect. In the context of "symbiotic" computing, IoT devices engage in a tightly-knit interaction that extends beyond mere connectivity. They share resources and collaboratively manage computing tasks through the high-speed capabilities of 6G networks, enabling them to jointly perform inference and training of large-scale AI models. This is not a simple cooperative effort, but an interdependent relationship where the performance and efficiency of one participant are significantly enhanced by the others.

Building symbiotic IoT for giant AI over the 6G network needs foundational innovations of the whole communication and computing infrastructure, across edge to the cloud. We also rely on machine learning, blockchain, and other inter-disciplinary techniques to address the unique challenges posed by integrating giant AI models with IoT infrastructures, ensuring that systems are secure, adaptable, and resilient. This special issue looks for original and high-quality research works related to the following topics, but not limited to:

- Design and Optimization of Distributed Architectures for Symbiotic IoT
- Novel Giant AI Model Structures for Symbiotic IoT
- 6G Network Innovations for Enhanced IoT-AI Integration
- Security and Privacy for Symbiotic IoT Ecosystems
- Resource Management and Scalability in Symbiotic IoT Systems
- Robustness and Reliability of AI Services in Symbiotic IoT
- Federated Learning for giant AI models in symbiotic IoT
- Blockchain for symbiotic IoT empowered by giant AI

Important Dates:

- Submission Deadline: April 15, 2025
- First Review Due: May 31, 2025
- Revision Due: June 30, 2025
- Second Review Due/Notification: July 31, 2024
- Final Manuscript Due: August 31, 2025
- Publication Date: November 2025

Submission Guidelines:

All manuscripts to the IEEE IoT Journal must be submitted 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 http://ieee-iotj.org/guidelines-for-authors/.

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