

Call for Papers

IEEE Internet of Things Journal Special Issue on Large Language Models for Intelligent Network Operation and Optimization in the Internet of Things

With the rapid development of information technology, the Internet of Things (IoT) has become a bridge connecting the physical world and the digital world, and is widely used in many fields such as smart home, intelligent transportation, industrial automation, and medical health. IoT devices have achieved data collection, transmission, and processing through sensors, actuators, communication protocols, and other technologies, bringing unprecedented convenience and efficiency improvements to modern society. However, with the expansion of the scale and complexity of the Internet of Things, network operation and performance optimization are facing unprecedented challenges. Traditional network operation and maintenance methods often rely on manual operations and empirical judgments, making it difficult to cope with real-time monitoring and troubleshooting of large-scale IoT devices. At the same time, the heterogeneity, dynamic nature, and uncertainty of IoT devices also pose great difficulties for performance optimization. In recent years, Large Language Models (LLMs) such as GPT and LLaMA have made significant progress in the field of Natural Language Processing (NLP), demonstrating strong abilities in text generation, understanding, and reasoning. These models can not only process natural language text, but also be applied to multiple fields such as code generation, knowledge question answering, and machine translation, opening up new paths for the development of artificial intelligence. This special issue is devoted to the latest developments and research outcomes addressing the related computing, algorithm, and application aspects on intelligent network operation and performance optimization with LLM for Internet of Things. It also provides a platform for worldwide researchers and practitioners to exchange their ideas and solutions to these challenges.

The special section is devoted to focus on various trends, challenges, and solutions for Intelligent Network Operation and Optimization based on LLM in the IoT. The submitted work should be unpublished technical articles with a substantial novel contribution towards the scope. The topics of interest include, but are not limited to the following:

- Cloud edge-client IoT LLM applications for networking operations
- LLM technologies for network fault diagnosis and health management
- LLM for network digital twin
- LLM for intelligent network design and configuration
- New networking architectures of IoT for LLM
- Software platforms of LLM for IoTs
- LLM for Network routing, congestion control and traffic engineering.
- Network architectures and protocols for LLM edge learning.
- LLM for Space air ground integrated network (SAGIN) assisted IoT.
- Network configuration and automation using LLMs
- Fault detection, prediction, and mitigation in IoT networks with LLMs
- Traffic modeling and optimization in IoT networks leveraging LLMs
- Security and privacy enhancements in IoT networks through LLMs
- Quality of service (QoS) and performance optimization in IoT networks using LLMs
- Integration of LLMs with edge computing and fog computing for IoT networks

- Network intelligent monitoring and early warning in IoT networks with LLMs
- Energy and computation efficient LLMs for Edge-Computing in IoT
- Hardware acceleration techniques for LLMs in IoT networks
- Parallel & distributed data processing techniques with LLMs in IoT

Important Dates:

Submission Deadline: Sep. 15, 2024 ·

Review Completed: Nov. 20, 2024 ·

Final Manuscript Due: Dec. 15, 2024 ·

Publication Date: February 2025

Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, <https://mc.manuscriptcentral.com/iot>. During the submission process, please select the special issue "Large Language Models for Intelligent Network Operation and Optimization in the Internet of Things" as the target.

For any technical assistance with the submission process, please refer to the journal's author guidelines or contact the editorial office at tangfengxiao@csu.edu.cn. Author guidelines and submission information can be found at <http://ieee-iotj.org/guidelines-for-authors/>.

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For any inquiries related to the special issue, please feel free to contact the guest editors at tangfengxiao@csu.edu.cn.

We encourage you to submit your groundbreaking research in this exciting field and contribute to advancing the knowledge on Large Language Models for Intelligent Network Operation and Optimization in the Internet of Things. We look forward to receiving your submissions.