

Editorial

From Connectivity to Intelligence: Shaping the Future of Internet of Things

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Recent years have witnessed a profound shift in the digital landscape, due to the fast advancements in sensing, communication, computing, and artificial intelligence (AI). These changes have been speeding up the development of the Internet of Things (IoT), enabling intelligence to be deeply embedded into connected devices and systems. As billions of devices are integrated into the physical world, the major challenge has been moved from just connecting these devices to empowering them to make intelligent decisions and interactions. The pervasive intelligence, distributed across the heterogeneous system, has become essential for next-generation IoT. It holds great potential to significantly improve efficiency, sustainability, and quality of service in IoT.

IoT system is characterized by its large scale, diversity, and high dynamics. Moreover, the IoT devices vary widely in terms of sensing capacities, computing power, and battery size. As new applications emerge, ultra-fast response times, high reliability, and context awareness are highly demanded. However, conventional isolated intelligence and centralized processing cannot satisfy those requirements. Therefore, intelligence needs to be fully integrated across the system, which expect to change the way for IoT systems to understand their surrounding environments, analyze complex situations, and take appropriate actions. With pervasive intelligence, we can improve the response speed, reduce communication load, and enhance data privacy.

In the meanwhile, the pervasive deployment of intelligence also incurs new challenges in system design and operation. Intelligent IoT systems need to operate reliably even under strict resource limits and be resilient to noise and interference, various attacks, and potential system failures. In addition, trustworthy intelligence, characterized by robustness, transparency, explainability, and accountability, is also key for wide adaptation of IoT technology in safety-critical and socially sensitive areas. Smart IoT systems not only interacts with machines, but also with human, adding further complexity. In this regard, interdisciplinary research that brings expertise from various fields is needed to address these challenges.

The *Journal of Pervasive Intelligence and Internet of Things (PIIoT)* serves as a platform for sharing top-notch research in this emerging domain. The journal focuses on the theories, system and algorithm designs, as well as applications that allow intelligence to function seamlessly across interconnected settings. It expects to help improve the fundamental understanding and practical implementation of these technologies. *PIIoT* welcomes submissions on a wide range of topics, including but not limited to:

- AI for IoT: deep learning, reinforcement learning, federated learning and other emerging AI solutions for IoT systems and services.
- Edge and cloud computing: task offloading, resource orchestration, and optimization for distributed and pervasive intelligence.
- Communication networks: 5G/6G networking, space-air-ground integrated networks, agent communications, green networking, and intelligent resource management.
- Security and privacy: secure and robust AI, intrusion detection systems, privacy preservation and resilience in intelligent IoT systems.
- Perception and data analytics: multimodal sensing, cooperative perception, data fusion
- Applications and services: smart cities, smart factories, smart grid, e-health, industrial IoT.



PIIoT aims to accelerate the transition from connectivity to intelligence for IoT ecosystems. We invite the researchers and scholars to submit their high-quality works to advance pervasive intelligence and the IoT.

Conflicts of Interest

The author declares no conflict of interest.

Use of AI and AI-Assisted Technologies

During the preparation of this work, the author used Deepseek for language polishing. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the published article.