The 21st IEEE International Conference on Ubiquitous Intelligence and Computing (UIC 2024)
Special Session on Collaborative Edge Intelligence and Its Emerging Applications (EdgeAI)
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In recent years, we have witnessed the great success of edge computing with a wide range of successful applications, such as on-site IoT (internet of things) data processing and smart home. In these applications, edge devices receive computation tasks from the end devices and collaborate with the cloud to accomplish the tasks. However, such edge computing solutions are inadequate. On the one hand, edge devices still need to communicate frequently with the remote central cloud, leading to high latency and privacy concerns. On the other hand, edge devices only handle simplistic tasks, while emerging applications (e.g., intelligence transportation systems and metaverse) demand advanced AI services.

To address the limitations, the industry and research communities have proposed collaborative edge intelligence (CEI), a new distributed computing paradigm in which edge devices are interconnected to provide artificial intelligence services. CEI is autonomous in that it eliminates reliance on remote central clouds to perform tasks. In CEI, edge devices are equipped with heterogeneous hardware (e.g., TPU, GPU, and CPU) to support the training and inference of AI models. CEI echoes the increasing demands on AI hardware and services.

Researchers and practitioners are also investigating the integration of CEI with other emerging technologies, including large AI models, blockchain, 6G, and web3. For instance, it is possible to infer and finetune large AI models on CEI now, and training is also on the way to realization. Blockchain technology can be employed as the system-level security solution, 6G provides ultra-low latency networks to connect edge and end devices, and web3 can build a fast-developing and autonomous ecosystem for CEI.

This special session aims to tackle the challenging issues and foster original research and innovative solutions related to collaborative edge intelligence. We welcome the dissemination of high-quality research on emerging ideas, approaches, theories, frameworks, and practices of collaborative edge intelligence. Prospective authors are invited to submit original work on topics including but not limited to:

- New collaborative edge intelligence framework, architecture, and platforms
- Training and inference of AI models on the edge
- Large AI models in collaborative edge intelligence
- Resource management in collaborative edge intelligence
- Security, privacy, and trust in collaborative edge intelligence
- 6G and integrated sensing and communication in collaborative edge intelligence
- Incentives and ecosystem of collaborative edge intelligence
- Novel systems and case studies of collaborative edge intelligence
- Emerging applications of collaborative edge intelligence

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Selected papers, after substantial extension, will be recommended for potential fast-track publication at Computer Communications (IF: 6.0) special issue on "Artificial Intelligence of Things for Future Communication Networks" (https://www.sciencedirect.com/journal/computer-communications/about/call-for-papers). Please address your questions, if any, to Dr. Shan Jiang.