

CALL FOR PAPERS
IEEE TRANSACTIONS ON COMPUTATIONAL SOCIAL SYSTEMS
**Special Issue on Collaborative Learning and Distributed Intelligence in Cyber-Physical-Social
Systems and Applications**

Along with the rapid development of AI and machine learning techniques, Cyber-Physical-Social System (CPSS) now increasingly enables the intelligent human-computer interactions among human organizations, cyber networks, and physical systems through smart sensor networks associated with cloud/edge computing infrastructures. Currently, with the fundamental support of novel technologies including Artificial Intelligence of Things (AIoT) and big data analytics with large models, complex CPSS, applied in Industry 4.0, smart healthcare systems, and intelligent transportation systems, etc., leads to a promising and transdisciplinary intersection of AI, information science, and cognitive computing, etc.

In particular, distributed intelligence exploits cooperation between devices, communication infrastructures, and edge computing systems, which may optimally support CPSS by handling the distributed data independently in parallel. Collaborative learning integrates distributed learning between different peers, which can enhance CPSS to further make full use of cooperation between entities specializing in different tasks and data modalities. Therefore, the quality of CPSS-enhanced services and applications can be significantly improved from the incorporation of collaborative learning with distributed intelligence, which can efficiently manage and process heavily-loaded resources and big data mining in decentralized paradigms, toward next generation models for design and building of distributed smart applications. However, it is still facing not a few challenges, such as how to realize real-time processing as one of the fundamental requirements in communication, computation, and storage in CPSS when facing massive human-generated data every day; How to deal with the large-scale and distributed data generated by different sensors to ensure low-latency services; How to solve the heterogeneous nature and discover insightful knowledge from the multi-modality data with high-efficiency learning algorithms.

This special issue aims at: i) providing a platform for researchers and practitioners to demonstrate their novel research achievements and applications of collaborative learning and distributed intelligence in CPSS today and the foreseeable future, and ii) exploring potential research opportunities in emerging trends on the integration of physical distributed computing infrastructure, intelligent data-driven cyberspace, and human social intervention in specific application domains.

Topics of interest to this special issue include, but are not limited to:

- Collaborative learning in smart CPSS
- Distributed intelligence in end-edge-cloud systems
- Collaborative computing for smart human-machine interface design
- Multi-agent distributed system with collaborative learning
- Collaborative learning and distributed intelligence for smart manufacturing
- Collaborative learning with intelligent IoT for smart healthcare
- Big data analytics and application with collaborative learning in CPSS
- Theory and application of distributed intelligence in CPSS
- Federated learning and multi-agent reinforcement learning in CPSS
- Collaborative learning with privacy, security, and trust concerns in CPSS

Important Dates

Paper Submission Deadline:	Dec. 31, 2024
First Round of Reviews Deadline:	Mar. 31, 2025
Submission of Revision Deadline:	May 31, 2025
2nd Round of Reviews Deadline:	Jul. 31, 2025
Decision of Acceptance Deadline:	Aug. 31, 2025

Guest editors

Xiaokang Zhou, Shiga University, Japan

Kevin Wang, The University of Auckland, New Zealand

Jianhua Ma, Hosei University, Japan

Vincenzo Piuri, University of Milan, Italy

Paper Submission

All papers are to be submitted through the IEEE's Manuscript Central for Transactions on Computational Social Systems: <https://iee.atyponrex.com/journal/tcss>. Please select "Special Issue" under the Manuscript Category of your submission. All manuscripts must be prepared according to the IEEE Transactions on Computational Social Systems publication guidelines <https://ieeesmc.org/publications/transactions-on-computational-social-systems>.

Contact Information

Dr. Xiaokang Zhou (zhou@biwako.shiga-u.ac.jp)