Frontier of Artificial Network

Department of Data Science
香港城市大學
City University of Hong Kong

Benchmarking Multi-Party Privacy Computing and Exploring New Collaboration Paradigms

Invited Speaker
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Date: Feb 10, 2026 (Tue)
Time: 10:00am-11:00am (HKT)
Location: LAU 6-209, CityU

Biography

Guibo Luo is an Assistant Professor and Ph.D. Supervisor at the School of Electronic and Computer Engineering, Peking University. He received his Ph.D. from Peking University and conducted postdoctoral research at Harvard Medical School and Massachusetts General Hospital. His research focuses on privacy-preserving computation and foundation model training, emphasizing scientific pattern discovery from heterogeneous data in secure settings. He investigates efficient multi-institutional collaborative intelligence, developing a framework that connects (i) real-world multi-center datasets and evaluations, (ii) communication-efficient privacy-preserving learning, and (iii) collaboration between foundation and edge models under resource constraints. His work emphasizes reliability and accountability, leading to practical deployments in healthcare, embedded systems, and embodied intelligence. He has published over 80 papers in leading venues including IEEE TPAMI, IEEE JBHI, CVPR, ECCV, AAAI, and MICCAI, and serves as a reviewer for top conferences like CVPR, NeurIPS, and ICLR.

Abstract

In real-world clinical settings, medical imaging data is distributed, non-IID, and governed by strict privacy constraints. This hinders centralized training, while conventional multi-round federated learning (FL) introduces high communication costs and privacy risks. We provide an end-to-end roadmap from evaluation → training → deployment: (1) we establish reproducible benchmarks with multi-center, multi-modal data and heterogeneity metrics; (2) we propose low-interaction / one-shot generative collaboration, shifting aggregation from sharing parameters to “sharing generative knowledge,” reducing communication and exposure while approaching centralized performance; and (3) we develop bi-directional foundation–edge collaboration to transfer capability to lightweight models and improve adaptation to edge distributions, enabling compliant and deployable multi-party training.