

Leijie Wu

Research Scientist | Huawei Hong Kong Research Center

leijie_wu@outlook.com | +852 6634 2896 | Hong Kong SAR
leijiewu.github.io | Google Scholar | ORCID

Academic Profile

Research scientist at Huawei Hong Kong Research Center working on **efficient, knowledge-enhanced, and trustworthy AI systems**. My research connects federated and edge intelligence with foundation-model inference and memory-augmented agents. I bring experience in algorithm research, industrial system integration, English-medium university teaching, and student research mentoring.

Research Interests

Efficient LLM inference; agentic retrieval and memory; knowledge graphs; federated learning, unlearning, and edge intelligence.

Education

- **Ph.D. in Computer Science, The Hong Kong Polytechnic University, 2020 – 2024.**
 - Degree conferred Dec. 11, 2024; supervised by [Prof. Song Guo](#).
 - Dissertation: *Cooperation & Competition: Mechanism Design for Federated Optimization of Edge Intelligence*.
- **Visiting Ph.D. Student, École Polytechnique Fédérale de Lausanne, May 2023 – Dec. 2023.**
 - School of Computer and Communication Sciences; federated unlearning with [Prof. Anne-Marie Kermarrec](#).
- **B.S. in Automation, Beijing Institute of Technology, 2015 – 2019.**
 - Xuteli School; research focus: game theory and control theory.

Research Appointments and Experience

- **Research Scientist, Dec. 2024 – Present**
 - System Group, Theory Lab (Huawei 2012 Labs), Huawei Hong Kong Research Center.
 - **Efficient AI systems:** Developed sparse-attention and KV-cache methods, including a GQA approach integrated into Huawei's Unified Cache Management (UCM). Internal Qwen3-32B-BF16 tests on Ascend 910B2 (64 GB) showed 46% higher output throughput than full attention at 60K input / 4K output tokens. Additional work includes W4A8 deployment, speculative decoding, and vision-model optimization for a hospital application.
 - **Knowledge-enhanced AI:** Collaborated with Prof. Yangqiu Song's team at HKUST on [AutoSchemaKG](#). Developed hybrid vector/graph retrieval and knowledge-graph maintenance for applications in financial services, energy, and digital government.
 - **Agentic retrieval and memory:** Developed query decomposition and adaptive retrieval chains, improving MuSiQue retrieval recall from 35.9% to 64.2% over the internally evaluated baseline. Current work extends to long-term agent memory and graph-based code intelligence.
 - Detailed methods, evaluation conditions, and project status: [Research Portfolio](#).
- **Research Intern, Huawei Hong Kong Research Center, Dec. 2023 – Aug. 2024.** Theory Lab; time-series forecasting and multimodal LLM-based retrieval.
- **Research Assistant, The Hong Kong Polytechnic University, Sept. 2019 – Sept. 2020.** Department of Computing; federated-learning incentives and edge resource optimization with Prof. Song Guo.
- **Research Assistant, Beijing Institute of Technology, Nov. 2018 – Jul. 2019.** Cooperative UAV–UGV modeling, control, and tracking under visibility constraints with Prof. Kun Liu.
- **Embedded Systems Software Engineer, Zhejiang Dahua Technology Co., Ltd., Apr. – Oct. 2018.** Debugging, automated testing, and code-coverage analysis for embedded AI camera systems.

Research Agenda

Knowledge- and memory-augmented agentic AI: reliable evolving knowledge, adaptive retrieval, repository-level reasoning, and efficient, privacy-aware deployment. Detailed directions and prototype results: [Research Portfolio](#).

Publications

* Equal contribution.

Peer-Reviewed Journal Articles

- **Leijie Wu**, Song Guo, Yaohong Ding, Junxiao Wang, Wenchao Xu, Yufeng Zhan, and Anne-Marie Kermarrec. "Rethinking Personalized Client Collaboration in Federated Learning." *IEEE Transactions on Mobile Computing (TMC)*. 2024; 23(12): 11227-11239. [\[Paper\]](#)
- Yi Liu, Song Guo, Yufeng Zhan, **Leijie Wu**, Zicong Hong, and Qihua Zhou. "Chiron: A Robustness-Aware Incentive Scheme for Edge Learning Via Hierarchical Reinforcement Learning." *IEEE Transactions on Mobile Computing (TMC)*. 2024; 23(8): 8508-8524. [\[Paper\]](#)
- **Leijie Wu**, Song Guo, Yi Liu, Zicong Hong, Yufeng Zhan, and Wenchao Xu. "Long-term Adaptive VCG Auction Mechanism for Sustainable Federated Learning with Periodical Client Shifting." *IEEE Transactions on Mobile Computing (TMC)*. 2024; 23(5): 6060-6073. [\[Paper\]](#)
- **Leijie Wu**, Song Guo, Junxiao Wang, Zicong Hong, Jie Zhang, and Yaohong Ding. "Federated Unlearning: Guarantee the Right of Clients to Forget." *IEEE Network*. 2022; 36(5): 129-135. [\[Paper\]](#)
- Yufeng Zhan, Peng Li, **Leijie Wu**, and Song Guo. "L4L: Experience-Driven Computational Resource Control in Federated Learning." *IEEE Transactions on Computers (TC)*. 2022; 71(4): 971-983. [\[Paper\]](#)
- Yufeng Zhan, Jie Zhang, Zicong Hong, **Leijie Wu**, Peng Li, and Song Guo. "A Survey of Incentive Mechanism Design for Federated Learning." *IEEE Transactions on Emerging Topics in Computing (TETC)*. Early access, 2021. [\[Paper\]](#)

Peer-Reviewed Conference Papers

- Jiaxin Bai, Wei Fan, Qi Hu, Qing Zong, Chunyang Li, Hong Ting Tsang, Hongyu Luo, Yauwai Yim, Haoyu Huang, Xiao Zhou, Feng Qin, Tianshi Zheng, Xi Peng, Xin Yao, Huiwen Yang, **Leijie Wu**, Ji Yi, Gong Zhang, Renhai Chen, and Yangqiu Song. "AutoSchemaKG: Autonomous Knowledge Graph Construction through Dynamic Schema Induction from Web-Scale Corpora." *The 64th Annual Meeting of the Association for Computational Linguistics (ACL)*. 2026: 20557-20584. [\[Paper\]](#)
- Jingze Zhang, **Leijie Wu**, Xi Peng, Qingqing Yang, Ruilun Liu, and Hong Xu. "PP-OpenNet: Privacy-Preserved Open Set Classification for Network Traffic." *IEEE International Conference on Computer Communications (INFOCOM)*. 2026: 1-6. [\[Paper\]](#)
- **Leijie Wu**, Yaohong Ding, Akash Dhasade, Martijn De Vos, Anne-Marie Kermarrec, and Song Guo. "QuickDrop: Efficient Federated Unlearning via Synthetic Data Generation." *25th International Middleware Conference (Middleware 2024)*. 2024. [\[Paper\]](#)
- **Leijie Wu**, Song Guo, Yi Liu, Zicong Hong, Yufeng Zhan, and Wenchao Xu. "Sustainable Federated Learning with Long-term Online VCG Auction Mechanism." *IEEE 42nd International Conference on Distributed Computing Systems (ICDCS)*. 2022: 895-905. [\[Paper\]](#)
- Yi Liu*, **Leijie Wu***, Yufeng Zhan, Song Guo, and Zicong Hong (* indicates co-first authors with equal contribution). "Incentive-Driven Long-term Optimization for Edge Learning by Hierarchical Reinforcement Mechanism." *IEEE 41st International Conference on Distributed Computing Systems (ICDCS)*. 2021: 35-45. [\[Paper\]](#)

Preprints

- **Leijie Wu**, Song Guo, Junxiao Wang, Zicong Hong, Jie Zhang, and Jingren Zhou. "On Knowledge Editing in Federated Learning: Perspectives, Challenges, and Future Directions." *arXiv*. 2023. [\[Paper\]](#)
- **Leijie Wu**, Song Guo, Yaohong Ding, Junxiao Wang, Wenchao Xu, Jie Zhang, and Richard Yida Xu. "Demystify Self-Attention in Vision Transformers from a Semantic Perspective: Analysis and Application." *arXiv*. 2022. [\[Paper\]](#)

Teaching Experience

- **Teaching Assistant, Department of Computing, The Hong Kong Polytechnic University, 2020 – 2023.**
 - Led English-medium tutorials across all listed courses for classes of approximately 50–100 students, preparing tutorial slides and supporting teaching materials.
 - Managed student-facing teaching responsibilities as a TA, including consultation and learning support, assignments, course projects, examinations, and grading.
 - Courses:
 - **COMP4431: Artificial Intelligence**, Fall 2020 — Level 4 undergraduate course covering problem solving and search, knowledge representation and reasoning, and machine learning.
 - **COMP4434: Big Data Analytics**, Fall 2021 — Level 4 undergraduate course covering NoSQL data management, Hadoop and MapReduce, machine learning, graph analytics, recommender systems, and data visualization.
 - **COMP5511: Artificial Intelligence Concepts**, Spring and Fall 2022 — Level 5 postgraduate course covering search and game playing, knowledge representation and reasoning, uncertainty management, expert systems, machine learning, and neural networks.
 - **COMP4121: E-Commerce Technology and Applications**, Spring 2023 — Level 4 undergraduate course covering web technologies, cryptography and internet security, electronic payment systems, and e-commerce system design and implementation.

Research Supervision and Mentoring

- **Master's research mentoring:** Mentored at least five master's students on dissertation research. In Fall 2022, provided day-to-day research guidance to Zhaoyang Zhang on his dissertation, *Personalized Federated Prompt Learning*, which received an outstanding dissertation award at PolyU.
- **Undergraduate research mentoring:** Mentored at least 10 undergraduate students. Among them, Yaohong Ding coauthored [QuickDrop](#), published at Middleware 2024, and is now pursuing a Ph.D. at The Education University of Hong Kong under the supervision of [Prof. Yu Yang](#).
- **Industry research mentoring:** Mentored at least five Huawei research interns on research development, system implementation, and translation into industrial applications.

Honors and Awards

- **Huawei Hong Kong Research Center Star Award (港研之星) – Team Award, Aug. 2026.**
 - Awarded as a member of the Knowledge Engineering and Knowledge Graph Team.

Selected Conference Presentations

- **QuickDrop: Efficient Federated Unlearning via Synthetic Data Generation.** 25th International Middleware Conference (Middleware 2024), Kowloon, Hong Kong SAR, December 2024. Presented by Leijie Wu. [\[Paper\]](#)
- **Long-term Adaptive VCG Auction Mechanism for Sustainable Federated Learning with Periodical Client Shifting.** COMP 50th Anniversary Research Student Conference, Hong Kong SAR, June 2024. Presented by Leijie Wu. [\[Paper\]](#)
- **Sustainable Federated Learning with Long-term Online VCG Auction Mechanism.** IEEE 42nd International Conference on Distributed Computing Systems (ICDCS), Bologna, Italy, July 2022. Presented by Leijie Wu. [\[Paper\]](#)

Academic Service

- **Conference reviewer:** IJCAI, ICML, AAI, NeurIPS, and IEEE INFOCOM.
- **Journal reviewer:** IEEE Transactions on Mobile Computing, IEEE Transactions on Cloud Computing, IEEE Internet of Things Journal, and IEEE Transactions on Sustainable Computing.

Technical Skills

- **Programming:** Python, C, C++, MATLAB.
- **Machine learning and distributed systems:** PyTorch, TensorFlow, Spark, Ray, Docker, and Linux.
- **Languages:** Mandarin (native), Cantonese (fluent), and English (proficient).