Ningxin Su

Present Appointment

Ph.D. Candidate
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Research Interests

My research interests are in the general areas of **distributed systems**, **edge computing**, **machine learning**, and **networking**. In particular, my past and ongoing work are in the areas of *distributed machine learning* and *federated learning*, focusing specifically on the training of Large Language Models in today's edge computing and metaverse environments.

Education

University of Toronto, Toronto, Ontario, Canada — 2020 – present

Ph.D., Electrical and Computer Engineering

Advisor: Baochun Li

Dissertation: Evaluating and Improving the Performance of Federated Learning Algorithms

University of Sheffield, Sheffield, South Yorkshire, England — 2020

M.Sc. (in Engr.)

Beijing University of Posts and Telecommunications, Beijing, China — 2019
(Joint Programme co-held by Queen Mary University of London)

B.Engr. & B.Management

Honours and Awards

Best Paper Award, for the paper co-authored with Baochun Li and Bo Li, titled *"Multi-Server Stable Rendezvous for the Metaverse,"* in the Proceedings of the First IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom 2023) — 2023

IEEE INFOCOM Student Travel Grant, IEEE International Conference on Computer Communications (INFOCOM 2024) — 2024

School of Graduate Studies Conference Grant, University of Toronto — 2024

Professional Experience

University of Toronto, Toronto, Ontario, Canada — 2023 – present
Ph.D. Candidate

Hong Kong University of Science and Technology, Hong Kong, P. R. China — Jul – Aug 2024
Research Assistant

City University of Hong Kong, Hong Kong, P. R. China — Jun – Aug 2023
Research Assistant

Publications

Refereed Journal Papers

[J1] **Ningxin Su**, Baochun Li. "MLOps in the Metaverse: Human-Centric Continuous Integration," in *IEEE Journal on Selected Areas in Communications*, Special issue on Human-Centric Communication and Networking for Metaverse over 5G and Beyond Networks. JSAC

Refereed Papers in Conference Proceedings (in reverse chronological order)

[C9] Zeyuan Zuo, **Ningxin Su**, Baochun Li, Teng Zhang. "Pack: Towards Communication-Efficient Homomorphic Encryption in Federated Learning," in the Proceedings of the *ACM Symposium on Cloud Computing* (SoCC 2024), Redmond, WA, USA, November 20 – 22, 2024 (acceptance ratio: 21%). SoCC'24

[C8] **Ningxin Su**, Baochun Li, Bo Li. "Democratizing the Federation in Federated Learning," in the Proceedings of the *IEEE International Conference on Mobile Ad-Hoc and Smart Systems* (MASS 2024), Seoul, South Korea, September 23 – 25, 2024 (acceptance ratio: 27%). MASS'24

[C7] Sijia Chen, **Ningxin Su**, Baochun Li. "Calibre: Towards Fair and Accurate Personalized Federated Learning with Self-Supervised Learning," in the Proceedings of the *IEEE International Conference on Distributed Computing Systems* (ICDCS 2024), Jersey City, USA, July 23 – 26, 2024 (acceptance ratio: 21%). ICDCS'24

[C6] Sijia Chen, **Ningxin Su**, Baochun Li. "Relic: Federated Conditional Textual Inversion with Prototype Alignment," in the Proceedings of the *IEEE/ACM International Symposium on Quality of Service* (IWQoS 2024), Guangzhou, China, June 19 – 21, 2024 (acceptance ratio: 34%). IWQoS'24

[C5] **Ningxin Su**, Chenghao Hu, Baochun Li, Bo Li. "Titanic: Towards Production Federated Learning with Large Language Models," in the Proceedings of the *IEEE International Conference on Computer Communications* (INFOCOM 2024), Vancouver, Canada, May 20 – 23, 2024 (acceptance ratio: 19%). INFOCOM'24

[C4] Baochun Li, **Ningxin Su**, Chen Ying, Fei Wang. "Plato: An Open-Source Research Framework for Production Federated Learning," in the Proceedings of the *ACM Turing Award Celebration Conference*, Wuhan, China, July 28 – 30, 2023. TURC'23

[C3] **Ningxin Su**, Baochun Li, Bo Li. "Multi-Server Stable Rendezvous for the Metaverse," in the Proceedings of the *First IEEE International Conference on Metaverse Computing, Networking and Applications* (MetaCom 2023), Kyoto, Japan, June 26 – 28, 2023 (acceptance ratio: 35%, **Best Paper Award**). MetaCom'23

[C2] **Ningxin Su**, Baochun Li. "Asynchronous Federated Unlearning," in the Proceedings of the *IEEE International Conference on Computer Communications* (INFOCOM 2023), New York, USA, May 17 – 20, 2023 (acceptance ratio: 19%). INFOCOM'23

[C1] **Ningxin Su**, Baochun Li. "How Asynchronous can Federated Learning Be?" in the Proceedings of the *IEEE/ACM International Symposium on Quality of Service* (IWQoS 2022), Virtual Conference, June 10 – 12, 2022 (acceptance ratio: 24%). IWQoS'22

Teaching Experience

Teaching Assistant, *ECE1724-F1: Performant Software Systems with Rust* Fall 2024
Duties included writing automarker scripts to evaluate the correctness of programming assignments, grading project proposals and final project deliverables, reproducing the submitted source code in final project deliverables, as well as assisting students with their questions in the online discussion forum.

Teaching Assistant, *APS105: Computer Fundamentals* Winter 2022
Duties included delivering 10 weeks of in-classroom tutorials to over 60 first-year engineering students, utilizing both conventional chalkboard teaching and live coding demonstrations. Additional duties involved preparing for the tutorial teaching material and grading final examinations.

Professional Service

Web Chair 2024, 2025
IEEE International Conference on Metaverse Computing, Networking, and Applications (IEEE MetaCom)

Artifacts Evaluation Committee Member 2024
ACM/IFIP International Middleware Conference (Middleware 2024)

Journal Reviewers
IEEE Transactions on Dependable and Secure Computing
ACM Transactions on Sensor Networks
IEEE Transactions on Big Data
IEEE Transactions on Computational Social Systems
IEEE Transactions on Cloud Computing
IEEE Transactions on Network Science and Engineering

Professional Memberships

Student Member, IEEE
IEEE Communications Society