Mengbing Liu

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SUMMARY

- I am a passionate researcher focusing on exploring deep learning algorithms to solve optimization problems in RIS/SIM-aided wireless communication networks. I have a strong desire to apply my skills to make meaningful contributions to the development of advanced technologies that will shape the future of our world.
- My research interest includes deep learning (DL), reconfigurable intelligent surface (RIS), stacked intelligent metasurface (SIM), and joint computing and communication (JCC).

EDUCATION

- **Doctor of Philosophy in Electrical and Electronic Engineering** **(Jan. 2024 - Present)**
  Nanyang Technological University
- **Master in Electronics and Communications Engineering** **(Sep. 2018 - Jun. 2021)**
  University of Science and Technology of China
- **Bachelor in Electronic Information Engineering** **(Sep. 2014 - Jun. 2018)**
  Northeastern University (CHINA)

WORK EXPERIENCE & ACADEMIC SERVICE & HONORS

- **Work Experience:** Research Assistant at Singapore University of Technology and Design.
  Supervisor: Prof. Chau Yuen (IEEE Fellow). (Sep. 2021 - Dec. 2023)
- **Academic Service:** Work as a volunteer in 2023/2024 IEEE 6G SUMMIT - SINGAPORE and IEEE VTC-Spring 2024. As a TPC member and reviewer in IEEE VTC-Spring/Fall 2025 (Track: Emerging Technologies, 6G and Beyond). As the reviewer of IEEE JSAC, IEEE TCCN, IEEE TVT, IEEE WCL, IEEE CL, IEEE System Journal, IEEE VTC-spring (2024,2025), China Communication, IEEE ICC 2024, IEEE WCNC 2024, IEEE WCSP 2023, IEEE GlobalCom (2023, 2024), and so on.
- **Honors:** IEEE MECOM 2024 travel grant (1500 USD); NTU Research Scholarship; Won the school's comprehensive scholarship five times during the bachelor period and three times during the master period; Won titles such as "Outstanding Student Leader" and "Advanced Individual" during the bachelor's period.

PUBLICATIONS

○ Journal Papers

- **M. Liu**, J. An, C. Huang, and C. Yuen, "Over-the-Air ODE-inspired Neural Network for Dual Task-Oriented Semantic Communications", *IEEE Transactions on Cognitive Communications and Networking (TCCN), 2025*.
- **M. Liu**, C. Huang, A. Al Hammadi, M. Di Renzo, M. Debbah, and C. Yuen, "Beamforming Design and Association Scheme for Multi-RIS Multi-User mmWave Systems through Graph Neural Networks", *IEEE Transactions on Wireless Communications (TWC), 2025*.
- **M. Liu** X. Li, B. Ning, C. Huang, S. Sun, and C. Yuen, "Deep learning-based channel estimation for double-RIS aided massive MIMO system," *IEEE Wireless Communications Letters*, vol. 12, no. 1, pp. 70–74, 2023.

- **M. Liu**, L. Qiu, and X. Liang, "Throughput analysis of UAV-assisted cellular networks by Matern hardcore point processes, *Journal of University of Chinese Academy of Sciences*, vol. 39, no. 5, p. 704, 2022.

○ Conference Papers

- **M. Liu**, X. Li, J. An, and C. Yuen, "Onboard Terrain Classification via Stacked Intelligent Metasurface-Diffractive Deep Neural Networks from SAR Level-0 Raw Data", *ICLR 3rd ML4RS workshop 2025*.

- **M. Liu**, J. An, C. Huang, A. Alhammadi, F. Bader, S. Muhaidat, M. Debbah, and C. Yuen, "Air-ODE Neural Network with Distributed RISs Aided Communication Systems," *IEEE Middle East Conference on Communications and Networking (MECOM), 2024.*

- **M. Liu**, C. Huang, M. Di Renzo, M. Debbah, and C. Yuen, "Cooperative beamforming and RISs association for multi-RISs aided multi-users Mmwave MIMO systems through graph neural networks," *IEEE International Conference on Communication (ICC)*, 2023.

○ Co-author Papers

- X. Li, **M. Liu**, and C. Yuen, "LLM Agent Communication Protocol (LACP) Requires Urgent Standardization: A Telecom-Inspired Protocol is Necessary," *NeurIPS 2025 Workshop: AI and ML for Next-Generation Wireless Communications and Networking (AI4NextG), 2025*.

- X. Li, **M. Liu**, W. Li, J. An, M. Debbah, and C. Yuen, "A mathematical modeling benchmark for LLMs in wireless communications," *Findings of the Association for Computational Linguistics (ACL Findings), 2025*.

- B. Wang, F. Zhu, **M. Liu**, C. Huang, Q. Yang, A. Al Hammadi, Z. Zhang, and M. Debbah, "Multi-Sources Information Fusion Learning for Multi-Points NLOS Localization, *IEEE Vehicular Technology Conference (VTC), 2024*.

WORK IN PROCESS

- X. Li, **M. Liu**, Y. Zhu, W. Zhang, W. Li, J. An, M. Debbah, and C. Yuen, "WirelessMathLM: Teaching Mathematical Reasoning for LLMs in Wireless Communications with Reinforcement Learning," *submitted to International Conference on Learning Representations (ICLR), 2025*.

- **M. Liu**, C. Yuen, "A New Paradigm of Signal Processing with Stacked Intelligent Metasurfaces: Challenges and Opportunities", under review at *IEEE Wireless Communication Magazine*.

- **M. Liu**, X. Li, J. An, and C. Yuen, "Wave-Guided Nonlinear Stacked Intelligent Metasurfaces for Analog Inference from Satellite SAR Data", under review at *IEEE IEEE Journal on Selected Areas in Communications (JSAC)* .

- **M. Liu**, X. Li, J. An, and C. Yuen, "Stacked Intelligent Metasurface-Diffractive Neural Networks for Onboard Terrain Classification from SAR Level-0 Raw Data", under review at *IEEE Transactions on Signal Processing*.

- **M. Liu**, C. Huang, and C. Yuen, "Machine learning for reflective metasurfaces orchestration", in Reconfigurable Metasurfaces for Wireless Communications: Architectures, Modeling, and Optimization, Part A, Spring Nature (Editors: George C. Alexandropoulos, Alessio Zappone, Nir Shlezinger, Marco Di Renzo, Yonina Eldar).