

# SHICONG LIU

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## 🎓 EDUCATION

### City University of Hong Kong

Doctor of Philosophy  
Electrical Engineering

09 2023 ~ 06 2027 (Est.)

Hong Kong SAR, China  
3.92/4.0

### Beijing Institute of Technology

Master of Engineering  
Information and Communication Engineering

09 2020 ~ 06 2023

Beijing, China  
Outstanding Graduate, Beijing

### Beijing Institute of Technology

Bachelor of Science  
Electronics and Information Engineering

09 2016 ~ 06 2020

Beijing, China  
7-th/94

## 🏆 AWARDS

- Exemplary Reviewer of IEEE Communications Letters 12 2024
- CityU Academic Excellence and QE Award 09 2024
- Entrance Fellowship of CityU Graduate School 09 2023
- Beijing Municipal Outstanding Master Graduate 06 2023
- **Hong Kong Ph.D. Fellowship Scheme (HKPFS) Awardee** 04 2023
- 2021 Outstanding Student 09 2021
- 2021 **National Scholarship** (2.5%) for Graduate Students 09 2021
- 2020 **National Scholarship** (2.5%) for Graduate Students 09 2020
- **Meritorious Winner** (7%) in Mathematical Contest in Modeling (MCM). 04 2019
- **1st place** in National Undergraduate Algorithmic Game Theory Championship. 08 2018

## ⚙️ RESEARCH

### Sensing Assisted Channel Estimation for Near-Field XL-MIMO

*Localization and Channel Estimation in the Near Field. Supervisor: Prof. Xianghao YU* 09 2024

- Propose to adopt **back-projection** based algorithm for near-field localization with significantly **reduced complexity** [J1].
- Further utilize the estimated location coordinates for channel estimation/beamfocusing [C1].

### Master's Thesis

*XL-MIMO Signal Processing Techniques. Supervisor: Prof. Zhen Gao* ~ 06 2023

- Channel estimation and beamforming techniques for XL-MIMO antenna arrays.
- Learning-based signal processing, e.g., CSI feedback and semantic communications [J2-3], [C2-3].

### Beijing Municipal Natural Science Foundation

*Reconfigurable Intelligent Surfaces (RISs) related research. Supervisor: Prof. Zhen Gao* 09 2019

- Architecture and algorithm design for RIS-assisted wireless systems. Utilizing the hybrid passive/active RIS structure and proposed an uplink greedy iterative channel estimation method to reconstruct the **sparse channel matrix** with limited overhead for MIMO-OFDM systems [J2].
- Survey on LEO satellites [A1].

## ✂️ TECHNICAL SKILLS

- **Coding:** Skilled in **MATLAB** and **Python** for communication system algorithm simulations and AI-related algorithms.
- **Language:** IELTS: 7.5 (L/R/W/S: 8.5/8/6.5/6.5).

## SERVICES

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- Academic

- **Session Chair**, *Antenna and Smart Antenna*, GLOBECOM'24, Cape Town. 2024 Dec.
- **Session Chair**, *Mobile and Wireless Networks*, ICC'23, Dalian, China. 2023 Aug.
- **Peer Reviewer**, IEEE ComSoc Journals and Conferences.

- Teaching

- **Research Assistant** at Dept. EE, City University of Hong Kong. 2024 Aug.
- **Teaching Assistant**:
  - \* EE3008 Principles of Communications, City University of Hong Kong 2024 Fall
  - \* EE3008 Principles of Communications, City University of Hong Kong 2024 Spring
  - \* EE3008 Principles of Communications, City University of Hong Kong 2023 Fall
  - \* Innovation and Entrepreneurship Projects, Beijing Institute of Technology 2023 Spring
  - \* Frontiers of Communication Technology, Beijing Institute of Technology 2022 Spring

## INTERNSHIP

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### ByteDance Ltd.

(Research Related) Beijing, China

*Researcher and Developer*

06 2022 – 09 2022

- Implementation research on multi-path UDP transmission schemes under real-time communication (RTC) scenario.
- Optimization of RTC transmission protocols on packet scheduling and buffering strategies.

### Cambricon Technology

(Campus Compulsory) Beijing, China

*Hardware Developer*

08 2019 – 09 2019

- Application Specific Integrated Chips (ASIPs) for neural network calculation acceleration.
- Software development for deploying Inception V3 model on Cambricon ASIPs by C++.

## PUBLICATIONS

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### Journals

- [J1] **S. Liu**, X. Yu\*, Z. Gao, J. Xu, D. W. K. Ng, and S. Cui, "Sensing-enhanced channel estimation for near-field XL-MIMO systems," *IEEE J. Sel. Areas Commun.*, vol. 43, no. 3, pp. 628–643, Mar. 2025.
- [J2] Z. Gao, **S. Liu**, Y. Su, Z. Li, and D. Zheng, "Hybrid knowledge-data driven channel semantic acquisition and beamforming for cell-free massive MIMO," *IEEE J. Sel. Top. Signal Process.*, vol. 17, no. 5, pp. 964–979, Sep. 2023.
- [J3] **S. Liu**, Z. Gao\*, J. Zhang, M. D. Renzo, and M.-S. Alouini, "Deep denoising neural network assisted compressive channel estimation for mmWave intelligent reflecting surfaces," *IEEE Trans. Veh. Technol.*, vol. 69, no. 8, pp. 9223–9228, Aug. 2020, (ESI Highly Cited).
- [J4] X. Zhou, K. Ying, **S. Liu**, M. Ke, Z. Gao\*, and M.-S. Alouini, "Reconfigurable intelligent surface assisted grant-free massive access," *Intell. Conver. Netw.*, vol. 3, no. 1, pp. 134–143, Mar. 2022.

### Articles

- [A1] L. Bian, X. Chang, S. Jiang, L. Yang, X. Zhan, **S. Liu**, D. Li, R. Yan, Z. Gao, and J. Zhang, "Large-scale scattering-augmented optical encryption," *Nat. Commun.*, vol. 15, no. 1, p. 9807, Dec. 2024.
- [A2] **S. Liu**, Z. Gao\*, Y. Wu, D. W. Kwan Ng, X. Gao, K.-K. Wong, S. Chatzinotas, and B. Ottersten, "LEO satellite constellations for 5G and beyond: How will they reshape vertical domains?" *IEEE Commun. Mag.*, vol. 59, no. 7, pp. 30–36, Jul. 2021.

### Conferences

- [C1] **S. Liu** and X. Yu\*, “Low-complexity near-field localization with XL-MIMO sectored uniform circular arrays,” in *Proc. IEEE Glob. Commun. Conf. (GLOBECOM)*, Cape Town, South Africa, Dec. 2024, pp. 4756–4761.
- [C2] **S. Liu**, X. Yu\*, Z. Gao, and D. W. K. Ng, “DPSS-based codebook design for near-field XL-MIMO channel estimation,” in *Proc. IEEE Int. Conf. Commun. (ICC)*, Aug. 2024, pp. 3864–3870.
- [C3] **S. Liu**, Z. Gao\*, G. Chen, Y. Su, and L. Peng, “Transformer-based joint source channel coding for textual semantic communication,” in *Proc. IEEE/CIC International Conference on Communications in China (ICCC)*, 2023, pp. 1–6.
- [C4] **S. Liu**, Z. Gao\*, C. Hu, S. Tan, L. Fang, and L. Qiao, “Model-driven deep learning based precoding for FDD cell-free massive MIMO with imperfect CSI,” in *Proc. International Wireless Communications and Mobile Computing (IWCMC)*, 2022, pp. 696–701.
- [C5] M. Wu, Z. Wan, Y. Wang, **S. Liu**, and Z. Gao\*, “Deep learning-based rate-splitting multiple access for massive MIMO-OFDM systems with imperfect CSIT,” in *Proc. International Symposium on Wireless Communication Systems (ISWCS)*, 2022, pp. 1–6.
- [C6] C. Zhang, H. Huang, Z. Zhang, and **S. Liu**, “Optimization of VCDTS algorithm in Connect6 game,” in *Proc. Chinese Control And Decision Conference (CCDC)*, 2018, pp. 6643–6646.