

# Zeyu Hao, MSc

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## Education

- 2022 – 2025 █ **MSc., University of Science and Technology of China (USTC)** in Information and Communication Engineering.  
Thesis title: *Energy-Efficient Transmission Systems and Methods for Integrated Sensing, Communications, and Powering.*  
GPA: 3.23/4.3, Ranking: Top 25%.  
One paper submitted to IEEE Transactions on Communications (TCOM), 2024-5-19 Major Revision, 2024-7-4 a revision has been submitted. Accessible in ArXiv: <https://arxiv.org/abs/2403.16353>
- 2018 – 2022 █ **B. S., University of Science and Technology of China (USTC)** in Electronic and Information Engineering.  
Thesis title: *Hybrid Beamforming for Secrecy Integrated Sensing and Communication.*  
GPA: 3.46/4.3, Weighted Average: 84.83/100, Arithmetic Average: 85.28/100, Ranking: 47/131.

## Current Research Interests

### Wireless Communications, Physical Layer

- █ Energy-efficient transmission systems and methods
- █ Multi-functional systems towards 6G: Integrated Sensing and Communications (ISAC), Wireless Information and Power Transfer (WIPT), Integrated sensing, communications, and powering (ISCAP)
- █ Hybrid beamforming and MIMO technology
- █ C-RAN, Coordinated multi-point (CoMP) transmission, cell-free MIMO, and cooperative beamforming
- █ Energy-efficient designs with dynamic hardware on-off control
- █ Probably more ...

### Optimization theory and methods

- █ Convex and non-convex optimization
- █ Convex relaxation methods
- █ Low-complexity optimization methods
- █ Probably more ...

### 6G Native AI

- █ AI for 6G: deep learning based and data-driven solutions to arising challenges, especially in physical layer wireless communications
- █ Probably more ...

## Research Publications

### Journal Articles

- 1 **Z. Hao**, Y. Fang, X. Yu, **J. Xu**, **L. Qiu**, L. Xu, and S. Cui, "Energy-efficient hybrid beamforming with dynamic on-off control for integrated sensing, communications, and powering," *arXiv e-prints, submitted to TCOM*, arXiv:2403.16353, Mar. 2024. DOI: 10.48550/arXiv.2403.16353.
- 2 **Z. Hao**, Z. Ren, **J. Xu**, and **L. Qiu**, "Energy-efficient transmit beamforming and transmitter on-off control for cell-free integrated sensing, communications, and powering," *to be submitted*, 2024.

## Patents

- 1 **Z. Hao**, Y. Fang, **L. Qiu**, **J. Xu**, and S. Cui, "A base station system and the power consumption optimization method, device, and equipment used for the base station system," CN202410044939.1, Jan. 10, 2024.

## Academic Activities

### Review

- WS29 IEEE ICC 2024 10th Workshop on Integrated Sensing and Communications for 6G
- Integrating Sensing and Comm for Ubiq 2024 Q1, IEEE Internet of Things Magazine
- 2023 International Conference on Wireless Communications and Signal Processing (WCSP)

### Visit

- 2022 ■ The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), China

### Cooperation

- Since 2022 ■ The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), China

## Project Experience

- Energy-efficient resource allocation based on practical constraints *Huawei*
- Theory and method of ultra low energy consumption mobile communication for the "carbon peaking and carbon neutrality" strategy *China National Key R&D Program Key Special Projects*

## Skills

- |           |  |
|-----------|--|
| Languages | ■ Strong reading, writing and speaking competencies for English (TOEFL 95/120 in total, with Reading 29/30 and Writing 25/30), Mandarin Chinese. |
| Coding    | ■ Matlab, Python, C++, L <sup>A</sup> T <sub>E</sub> X.  |
| Web Dev   | ■ HTML.  |
| Misc.     | ■ Academic research, teaching, training, consultation, L <sup>A</sup> T <sub>E</sub> X typesetting and publishing.                               |

## Miscellaneous Experience

### Awards and Achievements

- 2023 ■ Graduate Academic Scholarship - First Prize (Master's), USTC.  
2022 ■ Graduate Academic Scholarship - First Prize (Master's), USTC.

## References

### Prof. Jie Xu

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Associate Professor (Tenured) with the School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), China

*Jie Xu's IEEE Author Homepage:* <https://ieeexplore.ieee.org/author/37070344700>

### Prof. Ling Qiu

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Professor with the Department of Electronic and Engineering and Information Science, University of Science and Technology of China (USTC)

*Ling Qiu's IEEE Author Homepage:* <https://ieeexplore.ieee.org/author/37279946000>

### Prof. Xianghao Yu

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Assistant Professor with the Department of Electrical Engineering, City University of Hong Kong (CityU), Hong Kong

*Xianghao Yu's IEEE Author Homepage:* <https://ieeexplore.ieee.org/author/37085608777>

### Prof. Shuguang Cui

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IEEE Fellow, X.Q. Deng Presidential Chair Professor, the Executive Dean for the School of Science and Engineering at CUHK, Shenzhen, the Executive Vice Director at Shenzhen Research Institute of Big Data, and the Director for Future Network of Intelligence Institute (FNii), The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), China

*Shuguang Cui's IEEE Author Homepage:* <https://ieeexplore.ieee.org/author/37267838900>