Fenghao Zhu

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ORCID 0009-0005-9986-7054

Education

Zhejiang University, B.E. in Information Engineering Sep. 2019 – Jun. 2023

- GPA: 3.93/4
- IELTS: 7
- **Coursework:** Data analysis and Algorithm Design, Matrix Theory, Probability and Mathematical Statistics, Principles of Communications, Artificial Intelligence, Signal Processing.

Zhejiang University, M.S. in Information and Communication Engineering Sep. 2023 – Jun. 2026

- Supervisor: Prof. Chongwen Huang

Experience

Program Contributor, China National Key R&D Program Sep. 2023 - Jun. 2026

- Developed a neuron-inspired flexible neural network beamforming architecture to enhance robustness in dynamic and noisy environments.

Program Contributor, Key Program of the National Natural Science Foundation of China Jan. 2024 - Jun. 2026

- Developed a training-free manifold meta-learning architecture that collaborates the optimization of phase shifting matrix and precoding matrix in RIS-aided communications.

Program Contributor, Major International Joint Research Program (ZJU-UAE) Dec. 2022 - Dec. 2025

- Developed a beamforming inferring architecture to reduce beamforming overhead.

Standard Contributor, IMT-2030 (6G) Standard Promotion Group Nov. 2023 - Mar. 2024

- Presented research findings on AI and RIS topics at the IMT-2030 (6G) Promotion Group standards discussion meeting, contributing to the development and advancement of industry standards.

Research Assistant, Zhejiang University, Department of Information and Communication Aug. 2022 - Oct. 2022

- Design a Graph Neural Network (GNN)-based channel decoding algorithm to reduce bit error rate in end-to-end machine learning empowered wireless communications systems.

Research Assistant, Zhejiang University, Department of Electronics Jul. 2022 - Aug. 2022

- Implement the Discontinuous Galerkin Time Domain (DGTD) method in electromagnetic and thermal coupled fields problems.

Online Summer School, AI & Internet of Things (AIOT) with UIUC Jun. 2022 - Jul. 2022

- Learn about the AI techniques in Internet of Things.

Vice Minister, Zhejiang University ChinaGreentown Club Sep. 2021 - Sep. 2022

- Participate in club meetings and engage in public welfare activities.

Publications

Robust Beamforming for RIS-aided Communications: Gradient-based Manifold Meta Learning [Code] [Blog] [PDF] Aug. 2024

F. Zhu, X. Wang, C. Huang, Z. Yang, X. Chen, A. Alhammadi, Z. Zhang, C. Yuen, M. Debbah

Accepted by *IEEE Transactions on Wireless Communications, 2024.*

Beamforming Inferring by Conditional WGAN-GP for Holographic Antenna Arrays [PDF] Jul. 2024

F. Zhu, X. Wang, C. Huang, A. Alhammadi, H. Chen, Z. Zhang, C. Yuen, M. Debbah

Published in *IEEE Wireless Communications Letters, vol. 13, no. 7, pp. 2023-2027, Jul. 2024*

Robust Continuous-Time Beam Tracking with Liquid Neural Network [PDF] Dec. 2024

F. Zhu, X. Wang, C. Huang, R. Jin, Q. Yang, A. Alhammadi, Z. Zhang, C. Yuen, M. Debbah

Accepted by *Proc. of the 2024 IEEE Global Communications Conference (GLOBECOM), Dec. 2024.*

Robust Millimeter Beamforming via Self-Supervised Hybrid Deep Learning [PDF] Sep. 2023

F. Zhu, B. Wang, Z. Yang, C. Huang, Z. Zhang, G. C. Alexandropoulos, C. Yuen, M. Debbah

Published in *European Signal Processing Conference (EUSIPCO), Sep. 2023.*

Multi-Sources Information Fusion Learning for Multi-Points NLOS Localization [PDF] Jun. 2024

B. Wang, **F. Zhu**, M. Liu, C. Huang, Q. Yang, A. Alhammadi, Z. Zhang, M. Debbah

Accepted by *2024 IEEE 99th Vehicular Technology Conference (VTC2024-Spring), Jun. 2023.*

Robust Beamforming with Gradient-based Liquid Neural Network[Code] [PDF] Aug. 2024

X. Wang, **F. Zhu**, C. Huang, A. Alhammadi, F. Bader, Z. Zhang, C. Yuen, M. Debbah

Published in *IEEE Wireless Communications Letters. Published in early access.*

Energy-efficient Beamforming for RISs-aided Communications: Gradient Based Meta Learning [Code] [Blog][PDF] Jun. 2024

X. Wang, **F. Zhu**, Q. Zhou, Q. Yu, C. Huang, A. Alhammadi, Z. Zhang, C. Yuen, M. Debbah

Accepted by *Proc. of the 2024 IEEE International Conference on Communications (ICC), Jun. 9, 2024.*

Services

Reviewer for Journals: *IEEE Transactions on Communications*, *IEEE Communications Letters*, *Frontiers of Information Technology & Electronic Engineering*.

Reviewer for Conferences: *WS22 IEEE ICC 2023 2nd Workshop on Holographic MIMO Communications, 2023 IEEE/CIC International Conference on Communications in China (ICCC Workshops), 2023 International Conference on Wireless Communications and Signal Processing (WCSP), 2024 IEEE/CIC International Conference on Communications in China (ICCC Workshops)*.

Scholarships

2023: JiaShen Scholarship

2022: Zhejiang University Scholarship
2022: Yongpin Scholarship
2022: ChinaGreentown Scholarship
2022: National Encouragement Scholarship

2021: Zhejiang University Scholarship
2021: Yongpin Scholarship
2021: ChinaGreentown Scholarship
2021: National Encouragement Scholarship

2020: Zhejiang University Scholarship
2020: National Encouragement Scholarship

Awards

2023: Outstanding Graduates of Zhejiang University

2022: National Talents Training Base Award
2022: Zhejiang University Academic Excellence Award

2021: Zhejiang University Outstanding Student Award
2021: Zhejiang University Artistic and Athletic Achievement Award
2021: Zhejiang University Academic Excellence Award

2020: Zhejiang Provincial Advanced Mathematics Competition Award for University Students
2020: Zhejiang Provincial University Students Physics Innovation Competition Award

2020: Zhejiang University International Engagement Award
2020: Zhejiang University Student Volunteer Award
2020: Zhejiang University Academic Excellence Award

Patents

Robust multi-modal beam forming design method based on liquid neural network Aug. 2024
[Link]
X. Wang, **F. Zhu**, B. Wang, C. Huang
Published in State Intellectual Property Office, China, 2024, CN118300656A.

RIS auxiliary robust beamforming design method based on manifold meta learning Apr. 2024
[Link]
F. Zhu, X. Wang, C. Huang, C. Zhu, Z. Yang, X. Chen, Z. Zhang
Published in State Intellectual Property Office, China, 2024, CN117879669A.

Cross-scene robust beamforming design method based on hybrid meta learning Jan. 2024
[Link]
X. Wang, **F. Zhu**, Q. Zhou, Q. Yu, C. Zhu, C. Huang
Published in State Intellectual Property Office, China, 2024, CN117459106A.

An AI-based cross-dataset and cross-scenario robust beamforming design method Nov. 2023
[Link]
C. Huang, **F. Zhu**, X. Chen, C. Zhong, Z. Zhang
Published in State Intellectual Property Office, China, 2023, CN117097379A.

Channel decoding method and system based on graph neural network [Link] Jan. 2023
X. Wang, **F. Zhu**, Q. Zhou, Q. Yu, C. Zhu, C. Huang
Published in State Intellectual Property Office, China, 2023, CN115664899A.

Skills and Hobbies

Programming: Python, Pytorch, Latex, C, etc.
Software: Docker, MATLAB, HFSS, CST Studio Suite, Altium Designer, etc.
Sports: Table Tennis and Badminton, holding Zhejiang University Table Tennis Referee Certificate