

XIAOPENG ZHAO

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BIOGRAPHY

I am Xiaopeng Zhao, a Ph.D. student in the Department of Computing at The Hong Kong Polytechnic University, under the supervision of Dr. Yang Lei. Previously, I received my B.E. degree from Nanjing University. My primary research interests focus on mobile computing, wireless communication, intelligent sensing, and AI-driven wireless technologies, including indoor localization and wireless channel prediction.

EDUCATION

The Hong Kong Polytechnic University

Sep 2020 – Dec 2024 (*expected*)

Ph.D. Student in the Department of Computing

Supervisor: Dr. Lei Yang, Associate Professor

Nanjing University

2016 - 2020

B.Eng. in Control Science and Intelligent Engineering

AWARDS & HONORS

MobiCom'23 Best Paper Award Runner-Up (1/93), ACM MobiCom

2023

MobiCom'23 Demo Best Graduate Award (1/48), ACM MobiCom

2023

SECON'23 Best Paper Award (1/43), IEEE SECON

2023

People Scholarship, Nanjing University

2018 – 2019

1st Winner in Education Robot Contest of China, CAAI

2019

PUBLICATION

† Co-primary author

- [IMWUT/UbiComp'24] **Xiaopeng Zhao**[†], Shen Wang[†], Zhenlin An, Lei Yang, “Crowdsourced Geospatial Intelligence: Constructing 3D Urban Maps with Satellite Radiance Fields,” *The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 2024.
- [MobiSys'24] **Xiaopeng Zhao**[†], Guosheng Wang[†], Zhenlin An, Qingrui Pan, Lei Yang, “Understanding Localization by a Tailored GPT,” *The 22nd ACM International Conference on Mobile Systems, Applications, and Services*, 2024.
- [MobiCom'23] **Xiaopeng Zhao**, Zhenlin An, Qingrui Pan, Lei Yang, “NeRF2: Neural Radio-Frequency Radiance Fields,” *The 29th Annual International Conference on Mobile Computing and Networking*, 2023. (**Best Paper Award Runner-up**)
- [IoTJ'24] **Xiaopeng Zhao**, Guosheng Wang, Zhenlin An, Qingrui Pan, Qiongzhen Lin, Lei Yang, “Pushing the Boundaries of High-Precision AoA Estimation with Enhanced Phase Estimation Protocol,” *IEEE Internet of Things Journal*, 2024.
- [GetMobile'24] **Xiaopeng Zhao**, Zhenlin An, Qingrui Pan, Lei Yang, “Understanding Wireless Channels through NeRF²,” *ACM GetMobile: Mobile Computing and Communications*. (**Invited Paper**)
- [MobiCom'24] Shen Wang[†], **Xiaopeng Zhao**[†], Donghui Dai, Lei Yang, “Mirror Never Lies: Unveiling Reflective Privacy Risks in Glass-laden Short Videos,” *The 30th Annual International Conference on Mobile Computing and Networking*, 2024.

- [SECON'23] Qingrui Pan, Zhenlin An, Xiaopeng Zhao, Lei Yang, "Revisiting Backscatter Frequency Drifts for Fingerprinting RFIDs: A Perspective of Frequency Resolution," *The 20th Annual IEEE International Conference on Sensing, Communication, and Networking*, 2023. **(Best Paper Award)**
- [MobiCom Demo'23] Jingyu Tong, Zhenlin An, Xiaopeng Zhao, Sicong Liao, Lei Yang, "Demo: Radio Frequency Neural Networks for Wireless Sensing," *The 29th Annual International Conference on Mobile Computing and Networking*, 2023. **(Best Graduate Award)**
- [SenSys'23] Sicong Liao, Zhenlin An, Qingrui Pan, Xiaopeng Zhao, Jingyu Tong, Lei Yang, "XiTuXi: Sealing the Gaps in Cross-Technology Communication by Neural Machine Transition," *The 21st ACM Conference on Embedded Networked Sensor Systems*, 2023.
- [INFOCOM'23] Xueyuan Yang, Zhenlin An, Xiaopeng Zhao, Lei Yang, "Transfer Beamforming via Beamforming for Transfer," *The IEEE International Conference on Computer Communications*, 2023.
- [TMC'23] Qingrui Pan, Zhenlin An, Xiaopeng Zhao, Lei Yang, "The Power of Precision: High-Resolution Backscatter Frequency Drift in RFID Identification," *IEEE Transactions on Mobile Computing*, 2023.
- [TMC'23] Xueyuan Yang, Zhenlin An, Xiaopeng Zhao, Lei Yang, "Transfer Beamforming via Beamforming for Transfer," *IEEE Transactions on Mobile Computing*, 2023.
- [MobiCom'22] Qingrui Pan, Zhenlin An, Xueyuan Yang, Xiaopeng Zhao, Lei Yang, "RF-DNA: Large-Scale Physical-layer Identifications of RFIDs via Dual Natural Attributes," *The 28th Annual International Conference on Mobile Computing and Networking*, 2022.
- [MobiCom'21] Zhenlin An, Qiongzhen Lin, Xiaopeng Zhao, Lei Yang, Dongjiang Zheng, Guiqing Wu, Shan Chang, "One Tag, Two Codes: Identifying Optical Barcodes with NFC," *The 27th Annual International Conference on Mobile Computing and Networking*, 2021.

RESEARCH PROJECTS

1. Neural Channel Representation

This research aims to achieve wireless channel prediction by integrating electromagnetic ray tracing and machine learning methods through Neural Channel Representation, especially RF Radiance Field. This fusion strategy not only enhances the interpretability of neural network models but also leverages prior knowledge of wireless signal propagation to improve the accuracy of channel learning. The main contributions include:

- NeRF2: Neural Radio-Frequency Radiance Fields
- Crowdsourced Geospatial Intelligence: Constructing 3D Urban Maps with Satellites Radiance Fields

2. AI-Driven Wireless Localization

This research developed a hardware platform incorporating Wi-Fi, RFID, and BLE antenna array technologies. Based on this platform, a 3D indoor localization dataset with over one million data points was collected, covering 50 different scenarios. Cross-layer algorithm design from the physical layer to the learning layer was implemented based on this dataset. The main contributions include:

- Understanding Localization by a Tailored GPT
- Pushing the Boundaries of High-Precision AoA Estimation with Enhanced Phase Estimation Protocol

3. Mobile Human-Computer Interaction and Privacy Protection

With the widespread adoption of smart devices and mobile internet, mobile human-computer interaction is continuously evolving, and the demand for personal privacy protection is increasing. This research explores how to enhance mobile human-computer interaction experiences while ensuring efficient privacy protection. The main contributions include:

- Mirror Never Lies: Unveiling Reflective Privacy Risks in Glass-laden Short Videos
- One Tag, Two Codes: Identifying Optical Barcodes with NFC

SERVICE

Reviewer

- The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (2024)
- IEEE Transactions on Machine Learning in Communications and Networking (2024)

TEACHING EXPERIENCE

Information Technology, ENG 2003, Teaching Assistant. (Lecturer: Dr. Lei Yang.)	<i>2022/2023</i>
Web Application Design, COMP 3421, Teaching Assistant. (Lecturer: Dr. Lei Yang.)	<i>2021</i>
Computer Programming, ENG 2002, Teaching Assistant. (Lecturer: Dr. Dennis Liu.)	<i>2020 Fall</i>