

## BIOGRAPHY

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I am currently a postdoctoral researcher in Department of Computing at the The Hong Kong Polytechnic University, advised by [Dr. Lei Yang](#). My research interests are broadly including wireless system and networking, mobile computing, wireless sensing, and wireless security and privacy. Currently, I focus on hardware/software co-design for acoustic backscatter and sensing system, AI-driven wireless channel prediction and wireless localization and sensing.

## EDUCATION

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| <b>The Hong Kong Polytechnic University</b><br>Ph.D. in Computer Science, GPA: 3.5/4                                | Hong Kong SAR, China<br>2017.9–2021.10 |
| – Chief Supervisor: <a href="#">Dr. Lei Yang</a> , Co-supervisor: <a href="#">Prof. Jiannong Cao</a> (IEEE Fellow)  |  |
| – Thesis: “On Cross-Technology Mutualism in the Internet of Things: Communication and Localization”                 |  |
| <b>Dalian University of Technology</b><br>B.E. degree in Electronic Engineering and Information System, GPA: 90/100 | Dalian, China<br>2013.9–2017.7         |
| – Supervisor: <a href="#">Prof. Chengan Guo</a>   |  |

## PROFESSIONAL EXPERIENCE

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| <b>The Hong Kong Polytechnic University</b><br>Postdoctoral Fellow at Department of Computing, PolyU Matching Fund | Hong Kong SAR, China<br>2021.11–Present |
| <b>The Hong Kong Polytechnic University</b><br>Research Intern at Department of Computing                          | Hong Kong SAR, China<br>2016.11–2017.3  |

## RESEARCH PROJECTS

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- Wireless Localization and Sensing**
  - AI-driven wireless channel estimation and localization (MobiSys’20, MobiCom’23)
  - RF Antenna Array Localization Platform (INFOCOM’22, TOSN’22)
  - Pervasive Ultrasound Positioning System for Ultrasound-disable Smart Devices (MobiCom’19 and TMC’20)
  - Multi-modal Sensing: fusing RF and image sensor (SECON’20, TOSN’22)
- Novel Backscatter Communication and Sensing System**
  - Acoustic Backscatter System for RF-disable environment (SIGCOMM’22)
  - High throughput RFID System with PHY and MAC optimization (MobiCom’17, TON’19, INFOCOM’19, TON’20)
  - Backscatter Communication with carrier wave optimization (INFOCOM’21) and beamforming (INFOCOM’23)
- Cross-technology Communication System**
  - NFC to Camera Communication (MobiCom’23)
  - Fusing NFC and UHF RFID tags with novel flexible antenna design (MobiCom’21)
  - AM Radio and UHF RFID communication (INFOCOM’20, TON’22)
  - WiFi and UHF RFID communication (MobiCom’18, TON’20)
- IoT Security & Privacy**
  - Inaudible Command Injection and Protection in wireless charger (S&P’23)
  - Hardware Fingerprint Authentication in UHF RFID tag (MobiCom’22) and NFC Tag (INFOCOM’23)

†Co-primary author, ‡Co-corresponding author, [Google Scholar Page](#)

### Conference Articles

1. Xiaopeng Zhao, **Zhenlin An**, Qingrui Pan, Lei Yang  
NeRF2: Neural Radio-Frequency Radiance Fields  
In Proc. of **ACM MobiCom**, Madrid, Spain, Oct 2-6, 2023. (conditionally accept)
2. Donghui Dai, **Zhenlin An**, Qingrui Pan, Lei Yang  
MagCode: NFC-Enabled Barcodes for NFC-Disabled Smartphones  
In Proc. of **ACM MobiCom**, Madrid, Spain, Oct 2-6, 2023. (conditionally accept)
3. Donghui Dai<sup>†</sup>, **Zhenlin An**<sup>†</sup>, Lei Yang  
Inducing Wireless Chargers to Voice Out for Inaudible Command Attacks  
In **IEEE Security & Privacy (Oakland) 2023**.
4. Zheng Gong<sup>†</sup>, Lubing Han<sup>†</sup>, **Zhenlin An**<sup>‡</sup>, Lei Yang<sup>‡</sup>, Siqi Ding, Yu Xiang  
Empowering Smart Buildings with Self-Sensing Concrete for Structural Health Monitoring  
In Proc. of **ACM SIGCOMM**, Amsterdam, the Netherlands, Aug 22-26, 2022.
5. Qingrui Pan<sup>†</sup>, **Zhenlin An**<sup>†</sup>, Xueyuan Yang, Xiaopeng Zhao, Lei Yang  
RF-DNA: Large-Scale Physical-layer Identifications of RFIDs via Dual Natural Attributes  
In Proc. of **ACM MobiCom**, Sydney, Australia, Oct 17-22, 2022.
6. **Zhenlin An**, Qiongzheng Lin, Xiaopeng Zhao, Lei Yang, Dongjiang Zheng, Guiqing Wu, Shan Chang  
One Tag, Two Codes: Identifying Optical Barcodes with NFC  
In Proc. of **ACM MobiCom**, New Orleans, USA, Oct 25-29, 2021.
7. **Zhenlin An**<sup>†</sup>, Qiongzheng Lin<sup>†</sup>, Ping Li, Lei Yang  
General-Purpose Deep Tracking Platform across Protocols for the Internet of Things  
In Proc. of **ACM MobiSys**, Toronto, Canada, June 15-19, 2020.
8. Qiongzheng Lin<sup>†</sup>, **Zhenlin An**<sup>†</sup>, Lei Yang  
Rebooting Ultrasonic Positioning Systems for Ultrasound-Incapable Smart Devices  
In Proc. of **ACM MobiCom**, Los Cabos, Mexico, Oct 21-25, 2019.
9. **Zhenlin An**, Qiongzheng Lin, Lei Yang  
Cross-Frequency Communication: Near-Field Identification of UHF RFIDs with WiFi!  
In Proc. of **ACM MobiCom**, New Delhi, India, Oct 29 - Nov 2, 2018.
10. Xueyuan Yang, **Zhenlin An**, Xiaopeng Zhao, Lei Yang  
Transfer Beamforming via Beamforming for Transfer  
In Proc. of **IEEE INFOCOM**, New York area, USA, May 17 - 20, 2023.
11. Yanni Yang, Jiannong Cao, **Zhenlin An**, Yanwen Wang, Pengfei Hu, Guoming Zhang  
NFChain: A Practical Fingerprinting Scheme for NFC Tag Authentication  
In Proc. of **IEEE INFOCOM**, New York area, USA, May 17 - 20, 2023.
12. Qingrui Pan, **Zhenlin An**, Xiaopeng Zhao and Lei Yang  
LSAB: Enhancing Spatio-Temporal Efficiency of AoA Tracking Systems  
In Proc. of **IEEE INFOCOM**, 2-5 May 2022.
13. **Zhenlin An**, Qiongzheng Lin, Qingrui Pan, Lei Yang  
Turbocharging Deep Backscatter Through Constructive Power Surges with a Single RF Source  
In Proc. of **IEEE INFOCOM**, May 10-13 2021.
14. **Zhenlin An**, Qiongzheng Lin, Lei Yang, Lei Xie  
Activating Wireless Voice for E-Toll Collection Systems with Zero Start-up Cost  
In Proc. of **IEEE INFOCOM**, Beijing, China, April 27-30 2020.

15. Qiongzhen Lin, Lei Yang, **Zhenlin An**, Yi Guo, Ping Li  
RFCamera: Identifying RFIDs in Pixel Dimension  
In Proc. of **IEEE SECON**, Combo, Italy, June 22-25, 2020. (**Best Paper Award**)
16. **Zhenlin An**, Qiongzhen Lin, Lei Yang, Wei Lou  
Embracing Tag Collisions: Acquiring Bloom Filters across RFIDs in Physical Layer  
In Proc. of **IEEE INFOCOM**, Paris, April 29 - May 2, 2019.
17. Ping Li, **Zhenlin An**, Lei Yang, Panlong Yang  
Towards Physical-Layer Vibration Sensing with RFIDs  
In Proc. of **IEEE INFOCOM**, Paris, France, April 29 - May 2, 2019.
18. Lei Yang, Qiongzhen Lin, Chunhui Duan, **Zhenlin An**  
Analog On-tag Hashing: Towards Selective Reading as Hash Primitives for COTS Gen2 RFID Systems  
In Proc. of **ACM MobiCom**, Snowbird, UT, USA, Oct. 16-20, 2017.

## Journal Articles

1. **Zhenlin An**, Qiongzhen Lin, Lei Yang, Lei Xie  
Tagcaster: Activating Wireless Voice of Electronic Toll Collection Systems with Zero Start-up Cost  
in **IEEE/ACM Transactions on Networking** (IEEE/ACM ToN), Apr 2022.
2. Qingrui Pan, **Zhenlin An**, Qiongzhen Lin, Lei Yang  
LSAB: Enhancing Spatio-Temporal Efficiency of AoA Tracking Systems  
in **ACM Transactions on Sensor Network** (ACM TOSN), Apr 2022.
3. **Zhenlin An**<sup>†</sup>, Qiongzhen Lin<sup>†</sup>, Lei Yang, Yi Guo and Ping Li  
Localizing RFIDs in Pixel Dimensions  
in **ACM Transactions on Sensor Network** (ACM TOSN), Feb 2022.
4. **Zhenlin An**, Lei Yang, Qiongzhen Lin  
Identifying UHF RFIDs in Range of Readers with WiFi  
in **IEEE/ACM Transactions on Networking** (IEEE/ACM ToN), Feb 2021.
5. **Zhenlin An**, Qiongzhen Lin, Lei Yang, Wei Lou and Lei Xie  
Acquiring Bloom Filters across Commercial RFIDs in Physical Layer  
in **IEEE/ACM Transactions on Networking** (IEEE/ACM ToN), May 2020.
6. **Zhenlin An**<sup>†</sup>, Qiongzhen Lin<sup>†</sup>, Lei Yang, Yi Guo  
Revitalizing Ultrasonic Positioning Systems for Ultrasound-Incapable Smart Devices  
in **IEEE Transactions on Mobile Computing** (IEEE TMC), February 2020.
7. Ping Li, **Zhenlin An**, Lei Yang, Panlong Yang, Qiongzhen Lin  
RFID Harmonic for Vibration Sensing  
in **IEEE Transactions on Mobile Computing** (IEEE TMC), January 2020.
8. Shi Wenzhong, Zhewei Liu, **Zhenlin An**, Pengfei Chen  
RegNet: a neural network model for predicting regional desirability with VGI data  
in **International Journal of Geographical Information Science** (IJGIS), 2020
9. Qiongzhen Lin, Lei Yang, Chunhui Duan, **Zhenlin An**  
Tash: Towards Selective Reading as Hashing Primitives for Gen2 RFIDs  
in **IEEE/ACM Transactions on Networking** (IEEE/ACM ToN), April 2019.

## Demos

1. Daidong hui, **Zhenlin An**, Lei Yang  
Demo: Inducing Wireless Chargers to Voice Out, [Project Page](#)  
In Proc. of **ACM MobiCom**, Sydney, Australia, Oct 17-22, 2022 (**Best Demo Award Runner-up**)

2. Zheng Gong, **Zhenlin An**, Jingyu Tong, Donghui Dai, Lei Yang  
 Demo: Constructing Smart Buildings with In-concrete Backscatter Networks, [Project Page](#)  
 In Proc. of **ACM MobiCom**, Sydney, Australia, Oct 17-22, 2022 (**Best Demo Award Runner-up**)
3. **Zhenlin An**, Qiongzhen Lin, Lei Yang  
 Demo: Activating Wireless Voice for E-Toll Collection Systems with Zero Start-up Cost  
 In Proc. of **ACM MobiCom**, Los Cabos, Mexico, Oct 21-25, 2019
4. **Zhenlin An**, Qiongzhen Lin, Lei Yang  
 Demo: Near-Field Identification of UHF RFIDs with WiFi!  
 In Proc. of **ACM MobiCom**, New Delhi, India, Oct 29-Nov 2, 2018 (**Best Demo Award Runner-up**)

## PATENTS

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1. Qiongzhen Lin, Lei Yang, **Zhenlin An**  
 Image positioning method and device based on rotating antenna and terminal equipment  
 CN Patent Application No. 201911385016.8A, 2021.6.29

## PROFESSIONAL ACTIVITIES

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### Referee for submissions to journals:

- ACM/IEEE Transactions on Networking
- IEEE Transactions on Mobile Computing
- ACM Transactions on Sensor Networks
- IEEE Internet of Things Journal
- Journal of Computer Science and Technology
- ACM Transactions on Internet of Things

### Referee for submissions to conference:

- 2022 IEEE ICPADS, EAI MobiQuitous, ACM SIGCOMM SRC Juror

## AWARDS AND HONOURS

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- ACM SIGBED China Doctoral Dissertation Award 2022
- Best Demo Award Runner-up (2/20), ACM MobiCom 2022
- Best Paper Award (1/129), IEEE SECON 2020
- Best-In-Session Presentation Award, IEEE INFOCOM 2019
- Student Travel Grant, IEEE INFOCOM 2019
- Best Demo Award Runner-up (2/27), ACM MobiCom 2018
- Outstanding Graduate, Dalian University of Technology 2017
- Meritorious Winner, Interdisciplinary Contest in Modeling (ICM) 2016
- Gold Award, International Visual Designer for Arduino Competition, Labcenter Electronics 2016
- Third Prize, National English Competition for College Students 2015
- Area Second Prize, Chinese Undergraduate Mathematical Contest in Modeling (MCM) 2014

## TEACHING

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- Teaching Assistant at PolyU (Lecturer: Dr. Lei Yang) Spring 2021,  
Web Application Design and Development (COMP 3421)
- Teaching Assistant at PolyU (Lecturer: Dr. Lei Yang) Fall 2020, Spring 2020  
Internet Computing and Applications (COMP 5322)
- Teaching Assistant at PolyU (Lecturer: Prof. Guiling Wang) Fall 2019  
Crowdfunding and E-finance (COMP 4141)
- Teaching Assistant at PolyU (Lecturer: Dr. Lei Yang) Fall 2018  
Enterprise Web and Internet Computing for Managers (COMP 5321)
- Teaching Assistant at PolyU (Lecturer: Dr. Lei Yang) Spring 2019, Spring 2018, Fall 2017  
Mobile Computing (COMP 4342)
- Teaching Assistant at DUT (Lecturer: Yingjie Zhang) 2014-2017  
Microcomputer Assembly and Commissioning