

PAN Qingrui

Informatics Forum, University of Edinburgh, UK

+44 07587436007 | qr.pan@ed.ac.uk | panqingrui.github.io/homepage/

Education

The Hong Kong Polytechnic University

Ph.D. in Computer Science

- Chief Supervisor: Dr. Lei Yang; Co-supervisor: Prof. Bin Xiao
- Cumulative Grade Point Average: 3.88/4.3

Hong Kong

Sept 2019 - Dec 2023

City University of Hong Kong

B.E. in Information Engineering

- Bachelor of Engineering in Information Engineering with **First Class Honours**
- Cumulative Grade Point Average: 3.66/4.3

Hong Kong

Sept 2013 - May 2017

Professional Experience

University of Edinburgh

Research Associate

- Supervised by Prof. Mahesh K. Marina, within Institute for Computing Systems Architecture, School of Informatics.
- Play a key role in projects focusing on the advancement and evaluation of novel methods and systems to enable data-driven Open-RAN networks.

Edinburgh, UK

Dec 2023 - Dec 2024

Research Projects

1. Wireless Localization and Sensing

- Open-RAN-Based data-driven System for Positioning and Tracking
- Neural Radio-Frequency Radiance Field (MobiCom'23)
- RF Sparse Antenna Array for Angle of Arrival (AoA) Tracking (INFOCOM'22, TOSN'22)
- Million-scale Dataset from Four Semi-indoor and Ten Full-indoor Environments

2. IoT Security and Privacy

- Physical-layer Identification of UHF RFID Tag Using Intrinsic Frequency Response Chain (MobiCom'22)
- Physical-layer Identification of UHF RFID Tag Using Backscatter Link Frequency Shift (SECON'23, TMC'24)

3. Backscatter Communication

- Long-range Backscatter Communication with Carrier Wave Optimization (INFOCOM'21)
- Spatially Controllable Identification via Controlled Magnetic Fields (NSDI'24)

4. Cross-technology Communication

- Cross-technology Communication between NFC and Camera via Magnetic Interference (MobiCom'23)
- Cross-technology Communication by Neural Machine Transition (SenSys'23)

Publications

CONFERENCE PROCEEDINGS

1. **(Best Paper Award) Qingrui Pan**, Zhenlin An, Xiaopeng Zhao, Lei Yang, "Revisiting Backscatter Frequency Drifts for Fingerprinting RFIDs: A Perspective of Frequency Resolution", In Proc. of IEEE SECON, 2023 (CCF B, accepted rate: 23.6%)
2. **Qingrui Pan**, Zhenlin An, Xueyuan Yang, Xiaopeng Zhao, Lei Yang, "RF-DNA: Large-Scale Physical-layer Identifications of RFIDs via Dual Natural Attributes", In Proc. of ACM MobiCom, 2022 (CCF A, accepted rate: 17.6%)
3. **Qingrui Pan**, Zhenlin An, Qiongzhen Lin, Lei Yang, "LSAB: Enhancing Spatio-Temporal Efficiency of AoA Tracking Systems", in Proc. of IEEE INFOCOM, 2022. (CCF A, accepted rate: 19.9%)
4. Xueyuan Yang, Zhenlin An, **Qingrui Pan**, Lei Yang, Danyuan Lei, and Yulong Fan. "Binary Optical Machine Learning: Million-Scale Physical Neural Networks with Nano Neurons." In Proc. of ACM MobiCom, 2024 (CCF A)

- Donghui Dai, Zhenlin An, Zheng Gong, **Qingrui Pan**, Lei Yang, "RFID+: Spatially Controllable Identification of UHF RFIDs via Controlled Magnetic Fields", In Proc. of USENIX NSDI, 2024 (CCF A)
- Xiaopeng Zhao, Guosheng Wang, Zhenlin An, **Qingrui Pan**, Lei Yang, "Understanding Localization by a Tailored GPT", In Proc. of ACM MobiSys, 2024 (CCF B)
- (Best Paper Award Runner-Up)** Xiaopeng Zhao, Zhenlin An, **Qingrui Pan**, Lei Yang, "NeRF2: Neural Radio-Frequency Radiance Fields", In Proc. of ACM MobiCom, 2023 (CCF A)
- Donghui Dai, Zhenlin An, **Qingrui Pan**, Lei Yang, "MagCode: NFC-Enabled Barcodes for NFC-Disabled Smartphones", In Proc. of ACM MobiCom, 2023 (CCF A)
- Sicong Liao, Zhenlin An, **Qingrui Pan**, Xiaopeng Zhao, Jingyu Tong, Lei Yang, "XiTuXi: Sealing the Gaps in Cross-Technology Communication by Neural Machine Transition", In Proc. of ACM SenSys, 2023 (CCF B, accepted rate: 19.0%)
- Zhenlin An, Qiongzhen Lin, **Qingrui Pan**, Lei Yang, "Turbocharging Deep Backscatter Through Constructive Power Surges with a Single RF Source", In Proc. of IEEE INFOCOM, 2021 (CCF A, accepted rate: 19.9%)

JOURNAL ARTICLES

- 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.
- Qingrui Pan**, Zhenlin An, Qiongzhen Lin, and Lei Yang, "LSAB: Enhancing Spatio-Temporal Efficiency of AoA Tracking Systems," ACM Transactions on Sensor Networks, 2022.
- Donghui Dai, Zhenlin An, **Qingrui Pan**, and Lei Yang. "Harnessing NFC to Generate Standard Optical Barcodes for NFC-Missing Smartphones." IEEE Transactions on Mobile Computing, 2024.
- Xiaopeng Zhao, Zhenlin An, **Qingrui Pan**, and Lei Yang. "Understanding Wireless Channels Through NeRF2." GetMobile: Mobile Computing and Communications 28, 2024.
- Zhao, Xiaopeng, Guosheng Wang, Zhenlin An, **Qingrui Pan**, Qiongzhen Lin, and Lei Yang. "Pushing the Boundaries of High-Precision AoA Estimation With Enhanced Phase Estimation Protocol." IEEE Internet of Things Journal, 2024.

DEMO

- Donghui Dai, Zhenlin An, **Qingrui Pan**, Lei Yang, "Demo: MagCode: Bringing NFC Feature to All Smartphones," In Proc. of ACM MobiCom, 2023

Work Experience

Huawei Technologies, Co. Ltd

Assistant Researcher

Shenzhen, China

Oct - Dec 2020

Moxie Culture Communication, Co.

Content Creator

Shenzhen, China

Nov 2016 - Mar 2019

Technische Hochschule Nürnberg

Student Research Assistant

Nürnberg, Germany

May - July 2016

Teaching Experience

COMP2021 Object-Oriented Programming

Teaching Assistant (Lecturer: Dr. PEI Yu)

PolyU, HK

Fall 2019/2020

COMP3421 Web Application Design and Development

Teaching Assistant (Lecturer: Dr. YANG Lei)

PolyU, HK

Spring 2020/2021/2022

ENG2003 Information Technology

Teaching Assistant (Lecturer: Dr. YANG Lei)

PolyU, HK

Fall 2021, Spring 2023

Professional Services

Reviewer

- IEEE Transactions on Mobile Computing
- IEEE Conference on Standards for Communications and Networking

Talk

- Invited Talk at Open Positioning Annual Workshop by Huawei UK R&D
- COMP Research Student Seminar

Awards and Scholarships

2023	MobiCom'23 Best Paper Award Runner-Up , ACM MobiCom	<i>Madrid, Spain</i>
2023	SECON'23 Best Paper Award , IEEE SECON	<i>Madrid, Spain</i>
2022	INFOCOM'22 Student Conference Grant , IEEE INFOCOM	<i>Virtual</i>
2022	MobiCom'22 Travel Grant , ACM MobiCom	<i>Sydney, Australia</i>
2017	Assistantship under the Teaching Postgraduate Studentship Scheme , The Hong Kong Polytechnic University	<i>Hong Kong</i>
2016	Overseas Internship Scheme , City University of Hong Kong	<i>Hong Kong</i>
2013	CityU Mainland Student Scholarship Scheme - Full Tuition Scholarship , City University of Hong Kong	<i>Hong Kong</i>