

# PAN Qingrui

PQ509, The Hong Kong Polytechnic University, Hong Kong

☎ +852 65736869 | ✉ pan@tagsys.org | 🏠 <https://panqingrui.github.io/homepage/> | 💼 [www.linkedin.com/in/qingrui-pan-29158bb3](https://www.linkedin.com/in/qingrui-pan-29158bb3)

## Summary

I am a final year PhD candidate in the Department of Computing at Hong Kong Polytechnic University, focusing on fingerprinting work related to RFID systems, specifically indoor localization and hardware fingerprint for security issues. My research interests also include IoT, wireless sensing, and backscatter communication.

## Education

### The Hong Kong Polytechnic University

Hong Kong

Ph.D. in Computer Science

Sept 2019 - Current

- Chief Supervisor: Dr. Lei Yang, Co-supervisor: Prof. Bin Xiao
- Cumulative Grade Point Average: 3.88/4.3
- Expected to graduate before Oct 2023.

### City University of Hong Kong

Hong Kong

B.E. in Information Engineering

Sept 2013 - May 2017

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

## Publications

### CONFERENCE PROCEEDINGS

1. **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. Xiaopeng Zhao, Zhenlin An, **Qingrui Pan**, Lei Yang, "NeRF2: Neural Radio-Frequency Radiance Fields", In Proc. of ACM MobiCom, 2023 (CCF A)
5. Donghui Dai, Zhenlin An, **Qingrui Pan**, Lei Yang, "MagCode: NFC-Enabled Barcodes for NFC-Disabled Smartphones", In Proc. of ACM MobiCom, 2023 (CCF A)
6. 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

1. **Qingrui Pan**, Zhenlin An, Qiongzhen Lin, and Lei Yang, "LSAB: Enhancing Spatio-Temporal Efficiency of AoA Tracking Systems," ACM Transactions on Sensor Networks, 2022.
2. **Qingrui Pan**, Zhenlin An, Xueyuan Yang, Xiaopeng Zhao, Lei Yang, "Fingerprinting RFIDs with RF-DNA" (Submitted)

### DEMO

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

## Research Projects

### 1. Wireless Localization and Sensing

- 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
- Neural Radio-Frequency Radiance Field (MobiCom'23)

### 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)

### 3. Backscatter Communication

- Long-range Backscatter Communication with Carrier Wave Optimization (INFOCOM'21)

### 4. Cross-technology Communication System

- Cross-technology Communication between NFC and Camera via Magnetic Interference (MobiCom'23)

## Work Experience

---

### Huawei Technologies, Co. Ltd

Shenzhen, China

Assistant Researcher

Oct - Dec 2020

- Collaborated in a three-person team to develop a preliminary indoor RFID localization system. The system utilized a 4×4 antenna array to locate passive UHF RFID tags.
- Generated self-defined commands and transmitted them via USRP X310 to challenge the tags, extracting RSS and phase information from raw data.
- Created a Python interface to illustrate real-time localization results, achieving a localization error of less than 10cm.

### Moxie Culture Communication, Co.

Shenzhen, China

Content Creator

Nov 2016 - Mar 2019

- Collaborated with a four-person team as the main writer, creating over 20 pieces of non-fiction science comics. The comics garnered a total of three hundred million views. Additionally, collaborated in the publishing of four books, with total sales exceeding 600,000 copies.

### Technische Hochschule Nürnberg

Nürnberg, Germany

Student Research Assistant

May - July 2016

- Recognized bird species by their songs and extracted features using Short-time Fourier transform (STFT).
- Created a graphical user interface using MATLAB, enabling manual key segment cutting.

## Teaching Experience

---

### COMP2021 Object-Oriented Programming

PolyU, HK

Teaching Assistant (Lecturer: Dr. PEI Yu)

Fall 2019/2020

- Designed six basic tutorials on Java programming for program beginners and created corresponding slides.
- Delivered four tutorial classes each week for six weeks, with a total of more than 100 students each semester.

### COMP3421 Web Application Design and Development

PolyU, HK

Teaching Assistant (Lecturer: Dr. YANG Lei)

Spring 2020/2021/2022

- Designed and reviewed one homepage project, two assignments, and one quiz related to HTML and CSS for more than 120 students each semester.

### ENG2003 Information Technology

PolyU, HK

Teaching Assistant (Lecturer: Dr. YANG Lei)

Fall 2021, Spring 2023

- Delivered two to four workshops related to Microsoft Access each semester, depending on the number of students in the course.
- Designed and reviewed assignments related to database concepts and SQL.

## Professional Services

---

#### Reviewer

- IEEE Internet of Things Journal
- IEEE/ACM Transactions on Networking
- IEEE Transactions on Mobile Computing

#### Talk

- COMP Research Student Seminar

## Awards and Scholarships

---

2022 **INFOCOM Student Conference Grant**, INFOCOM

Virtual

2022 **MobiCom'22 Travel Grant**, MobiCom

Sydney, Australia

2017 **Assistantship under the Teaching Postgraduate Studentship Scheme**, The Hong Kong Polytechnic University

Hong Kong

2016 **Overseas Internship Scheme**, City University of Hong Kong

Hong Kong

2013 **CityU Mainland Student Scholarship Scheme - Full Tuition Scholarship**, City University of Hong Kong

Hong Kong