

# Renjie Zhao | Curriculum Vitae

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## RESEARCH INTEREST

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- **Wireless Systems and Networking:** Designing and implementing next-generation wireless network architectures (millimeter-wave, 5G NR, vehicle networks); hardware and software design (software defined radio, human-brain interface, ultra-wide-band, Internet-of-Things)
- **Mobile and Ubiquitous Computing:** Designing and implementing ubiquitous communication and sensing systems (virtual/augmented reality, smart homes, localization, smart supply chain)

## EDUCATION

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**University of California San Diego (UCSD)**

*Ph.D. Candidate, Electrical and Computer Engineering*

Advisor: Professor Xinyu Zhang

**San Diego, CA, US**

*Sept. 2018 - now*

**Shanghai Jiao Tong University (SJTU)**

*B.E. in Electric Power Engineering and Automation*

**Shanghai, China**

*Sept. 2014 - June 2018*

## EMPLOYMENT

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**Microsoft Research**

*Research Intern. Host: Krishna Chintalapudi*

Research and develop wireless communication protocol for Xbox.

**Remote, US**

*June 2021 - Dec. 2021*

**Alibaba Group**

*Research Intern. Host: Pengyu Zhang, Yunfei Ma*

Research and develop accurate and reliable RFID based localization and sensing system.

**Remote, US**

*June 2020 - Sept. 2020*

**Alibaba Group**

*Research Intern. Host: Pengyu Zhang, Yunfei Ma*

Research and build long range, high accuracy object identification system based on NFC.

**Bellevue, WA, US**

*Sept. 2019 - Jan. 2020*

## PUBLICATIONS

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Note: '\*' marks co-primary authors.

### Conference Papers:

[C4] "RF-Chord: Towards Deployable RFID Localization System for Logistic Networks"

Bo Liang, Purui Wang, **Renjie Zhao**, Pengyu Zhang, Xinyu Zhang, Hongqiang Harry Liu and Chenren Xu

*20th USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2023*

(50 out of 272 submissions, acceptance ratio: 18.4%)

[C3] "NFC+: Breaking NFC Networking Limits through Resonance Engineering"

**Renjie Zhao\***, Purui Wang\*, Yunfei Ma, Pengyu Zhang, Hongqiang Harry Liu, Xianshang Lin, Xinyu Zhang, Chenren Xu and Ming Zhang

*Annual conference of the ACM Special Interest Group on Data Communication on the applications, technologies, architectures, and protocols for computer communication (SIGCOMM), 2020*  
(54 out of 250 submissions, acceptance ratio: 22%)

**[C2] “M-Cube: A Millimeter-Wave Massive MIMO Software Radio”**

**Renjie Zhao**, Timothy Woodford, Teng Wei, Kun Qian and Xinyu Zhang  
*ACM International Conference on Mobile Computing and Networking (MobiCom), 2020*  
(62 out of 384 submissions, acceptance ratio: 16%)  
**Best Paper Award (2 out of 384 submission), Highlighted by GetMobile**  
**Opensourced research platform, M-Cube website, Used by 16+ groups**

**[C1] “OFDMA-Enabled Wi-Fi Backscatter”**

**Renjie Zhao**, Fengyuan Zhu, Siyuan Peng, Yuda Feng, Xiaohua Tian, Hui Yu and Xinbing Wang  
*ACM International Conference on Mobile Computing and Networking (MobiCom), 2019*  
(55 out of 290 submissions, acceptance ratio: 19%)

**Journal:**

**[J1] “M-CUBE: A Millimeter-Wave Massive MIMO Software Radio” (Invited)**

**Renjie Zhao**, Timothy Woodford, Teng Wei, Kun Qian and Xinyu Zhang  
*GetMobile: Mobile Computing and Communications, Volume 25, Issue 1, March 2021, pp 30–33*

Notes: Photoelectric related works hided, please refer to *google profile*

**Demo:**

**[D2] “Demo: M-Cube: An Open-Source Millimeter-Wave MIMO Software Radio for Wireless Communication and Sensing”**

**Renjie Zhao**, Timothy Woodford, Teng Wei, Kun Qian and Xinyu Zhang  
*The 20th ACM International Conference on Mobile Systems, Applications, and Services (Mobisys), 2022*

**[D1] “Demo: M-Cube: An Open-Source Millimeter-Wave MIMO Software Radio for Wireless Communication and Sensing Applications”**

**Renjie Zhao**, Timothy Woodford, Teng Wei, Kun Qian and Xinyu Zhang  
*ACM International Conference on Mobile Computing and Networking (MobiCom), 2020*

**Poster:**

**[P1] “Poster Abstract: Ultra-Wideband Backscatter Towards General Passive IoT Localization”**

**Renjie Zhao**, Penyu Zhang, Yunfei Ma and Xinyu Zhang  
*The 20th ACM Conference on Embedded Networked Sensor Systems (SenSys), 2022*

**Under submission:**

**[S4] “ADR-X: Reinforcement Learning Based Wireless Link Rate Adaptation for Gaming over Wi-Fi”**

Hao Yin, Renjie Zhao, Krishna Chintalapudi, Ranveer Chandra, Joe Schaefer, Stan Adermann, Srihari Narlanka, Perry Lea, and Sumit Roy  
*Under submission, 2022*

**[S3] “SlimWiFi: Ultra-Low-Power IoT Radio Architecture Enabled by Asymmetric Communication”**

Renjie Zhao, Wang Kejia, Zheng Kai, Xinyu Zhang, and Leung Vincent  
*Under submission, 2022*

**[S2] “Ultra-Wideband Backscatter Towards General Passive IoT Localization”**

Renjie Zhao, Pengyu Zhang, Yunfei Ma, and Xinyu Zhang  
*Under submission, 2022*

[S1] “M-Cube Radar: A Millimeter-Wave FMCW Radar with Hybrid MIMO Phased Array”  
Zheng Kai, **Renjie Zhao**, Timothy Woodford, and Xinyu Zhang  
*Under submission, 2022*

## HONORS AND AWARDS

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- ACM MobiCom Best Paper Award (2 out of 384 submission) 2020
- Academic Records Scholarship (first-class) (**Top 1 out of 158**) 2016 - 2017
- National Scholarship (**Top 3 out of 158**) 2016 - 2017
- Academic Records Scholarship (second-class) 2015 - 2016
- UHV Scholarship (**Top 5 out of 160**) 2015 - 2016
- Academic Records Scholarship (third class) 2014 - 2015

## TEACHING AND MENTORING

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### Teaching:

- ECE 257A Modern Communication Networks, Teaching Assistant *Fall 2022*

### Mentoring:

- Hao Le (undergraduate) *Summer 2022*  
FPGA supported magnetic and Wi-Fi link for high density neuron monitoring
- Bo Liang (undergraduate, now Ph.D. student at Peking University) *Summer 2021*  
Robust RFID localization with large antenna array and wide bandwidth [C4]
- Kai Zheng (fresh Ph.D., now Ph.D. student at UCSD) *Fall 2020*  
Hybrid MIMO mmWave RADAR which extends the spatial resolution
- Purui Wang (undergraduate, now Ph.D. student at MIT) *Fall 2019*  
Magnetic RFID for long range high accuracy tag reading [C3]
- Tejas Harekrishna Sadarahalli (M.S., now at Qualcomm) *Summer 2019*  
Vehicle-to-Everything cellular platform for Smart Transportation Innovation Program
- Soumyadeep Datta (undergraduate, now Ph.D. student at NYU) *Summer 2019*  
Vehicle-to-Everything cellular platform for Smart Transportation Innovation Program

## PRESENTATIONS

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- M-Cube: A Millimeter-Wave Massive MIMO Software Radio  
Conference talk at MobiCom, Virtual, September 2020
- NFC+: Breaking NFC Networking Limits  
Conference talk at SIGCOMM, Virtual, August 2020
- OFDMA-Enabled Wi-Fi Backscatter  
Conference talk at SIGCOMM, Los Cabos, October 2019

## SERVICE

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- SenSys 2022 Shadow PC
- External reviewer of MobiCom 2019-2022
- Reviewer of IEEE Transactions on Networking
- Reviewer of IEEE Transactions on Wireless Communications
- Reviewer of IEEE Transactions on Sensor Networks