Renjie Zhao | Curriculum Vitae

✆ (858) 257-7882   •   ✉ r2zhao@ucsd.edu   •   ➡ *Personal Page*   •   ☞ *Google Scholar*
8510 Costa Verde Blvd, APT 2210, San Diego, CA, 92122

RESEARCH INTEREST

● Wireless Systems and Networking: next-generation wireless network architectures (5G millimeter-wave, 6G joint communication and sensing, Internet of Things); novel radio hardware and software design (software defined radio, wireless brain interfaces, low-power ultra-wide-band).

● Mobile and Ubiquitous Computing: ubiquitous communication and sensing systems (smart homes, virtual/augmented reality, localization, ultra-reliable RFID for supply chains)

EDUCATION

University of California San Diego (UCSD)   **San Diego, CA, US**
Ph.D. Candidate, Electrical and Computer Engineering   *Sept. 2018 - June 2023 (expected)*
Advisor: Professor Xinyu Zhang

Shanghai Jiao Tong University (SJTU)   **Shanghai, China**
B.E. in Electric Power Engineering and Automation   *Sept. 2014 - June 2018*

EMPLOYMENT

Microsoft Research   **Remote, US**
Research Intern. Host: Krishna Chintalapudi   *June 2021 - Dec. 2021*
Research and develop wireless communication protocol for Xbox.

Alibaba Group   **Remote, US**
Research Intern. Host: Pengyu Zhang, Yunfei Ma   *June 2020 - Sept. 2020*
Research and develop accurate and reliable RFID based localization and sensing system.

Alibaba Group   **Bellevue, WA, US**
Research Intern. Host: Pengyu Zhang, Yunfei Ma   *Sept. 2019 - Jan. 2020*
Research and build long range, high accuracy object identification system based on NFC.

PUBLICATIONS

Note: '*' marks co-primary authors.

Conference Papers:
[C5] "SlimWiFi: Ultra-Low-Power IoT Radio Architecture Enabled by Asymmetric Communication"
Renjie Zhao, Kejia Wang, Kai Zheng, Xinyu Zhang, and Leung Vincent
20th USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2023
(46 out of 288 submissions, acceptance ratio: 16.0%)

[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: 21.6%)

[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: 16.1%)
Best Paper Award (2 out of 384 submission);
Highlighted by ACM GetMobile (Top Pics of ACM SIGMOBILE)
Open source research platform, *M-Cube website*, Used by 16+ research groups since Jan. 2021

[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: 19.0%)

Journal:
[J4] "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, Mar. 2021, pp 30–33

[J3] "Synthesis of CuInS2 nanowire arrays via solution transformation of Cu2S self-template for enhanced photoelectrochemical performance"
Ming Li, **Renjie Zhao**, Yanjie Su, Jing Hu, Zhi Yang, Yafei Zhang
Applied Catalysis B: Environmental, Volume 203, Apr. 2017, pp 715-724

[J2] "Hierarchically CuInS2 Nanosheet-Constructed Nanowire Arrays for Photoelectrochemical Water Splitting"
Ming Li, **Renjie Zhao**, Yanjie Su, Jing Hu, Zhi Yang, Yafei Zhang
Advanced Materials Interfaces, Volume 3, Issue 20, Oct. 2016, 1600494

[J1] "Carbon Quantum Dots Decorated Cu2S Nanowire Arrays for Enhanced Photoelectrochemical Performance"
Ming Li, **Renjie Zhao**, Yanjie Su, Zhi Yang, Yafei Zhang
Nanoscale, Volume 8, Issue 16, 2016, pp 8559-8567

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 review:
[S3] "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 review, 2022

[S2] "Ultra-Wideband Backscatter Towards General Passive IoT Localization"
Renjie Zhao, Pengyu Zhang, Yunfei Ma, and Xinyu Zhang
Under review, 2022

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

HONORS AND AWARDS

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

TEACHING AND MENTORING

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

- Lisa Takai (undergraduate) *Fall 2022*
Real time signal processing for mmWave channel measurement through FPGA acceleration

- 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 (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

- Song Wang (M.S., now Ph.D. student at UCSD) *Fall 2018*

Vehicle-to-Everything mmWave channel measurement and beamforming design

● Jingqi Huang (M.S., now Ph.D. student at Purdue University) *Fall 2018*
Vehicle-to-Everything mmWave channel measurement and beamforming design

● Yuda Feng (undergraduate, now Ph.D. student at UMass) *Spring 2018*
High concurrency high scalability OFDMA backscatter [C1]

● Fengyuan Zhu (undergraduate, now Ph.D. student at SJTU) *Fall 2017*
High concurrency high scalability OFDMA backscatter [C1]

PRESENTATIONS

● 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

● 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

REFERENCE

● Xinyu Zhang — Associate Professor
Email: xyzhang@eng.ucsd.edu — *University of California San Diego*

● Peter Asbeck — Professor
Email: asbeck@ece.ucsd.edu — *University of California San Diego*

● Hongqiang (Harry) Liu — Director of Engineering
Email: harry.liu@uber.com — *Uber*

● Ranveer Chandra — Managing Director, Research for Industry
Partner Manager, Networking Research
CTO, Agri-Food
Email: ranveer@microsoft.com — *Microsoft Research*