

JUNFENG GUAN

Email: junfeng.guan@epfl.ch

Telephone: +41 76 829 7438

Homepage: <https://jguan.page>

RESEARCH INTERESTS

Wireless Networks, Computer Systems, Internet of Things, RF/mmWave Circuits, Machine Learning

EDUCATION

École Polytechnique Fédérale de Lausanne (EPFL)

Postdoctoral Researcher - [SENS Lab](#)

Mar. 2023 - Present

Advisor: Prof. [Haitham Hassanieh](#)

University of Illinois Urbana-Champaign

Doctor of Philosophy in Electrical and Computer Engineering

May 2017 - Aug. 2022

Advisor: Prof. [Haitham Hassanieh](#)

Thesis: High-Performance Wireless Perception Using Deep Learning and MEMS Devices [\[pdf\]](#)

University of Illinois Urbana-Champaign

Bachelor of Science in Electrical Engineering (with Highest Honors)

Aug. 2013 - May 2017

Advisor: Prof. [Songbin Gong](#)

MAIN CONFERENCE AND JOURNAL PUBLICATIONS

14. **[Preprint'23]** Yiduo Hao*, Sohrab Madani*, [Junfeng Guan](#), Mohammed Alloulah, Saurabh Gupta, Haitham Hassanieh. "Bootstrapping Autonomous Radars with Self-Supervised Learning." *arXiv*, 2023. (*coprimary authors) [\[pdf\]](#)
13. **[ICASSP'23]** [Junfeng Guan](#), Sohrab Madani, Waleed Ahmed, Samah Hussien, Saurabh Gupta, Haitham Hassanieh. "Exploiting Virtual Array Diversity For Accurate Radar Detection." *IEEE International Conference on Acoustics, Speech and Signal Processing*, 2023. [\[pdf\]](#)
12. **[IPSN'23]** Ishani Janveja, Jiaming Wang, [Junfeng Guan](#), Suraj Jog, Haitham Hassanieh. "WINC: A Wireless IoT Network for Multi-Noise Source Cancellation." *ACM/IEEE International Conference on Information Processing in Sensor Networks*, 2023. [\[pdf\]](#)
11. **[ECCV'22]** [Junfeng Guan](#)*, Sohrab Madani*, Waleed Ahmed*, Saurabh Gupta, Haitham Hassanieh. "Radatron: Accurate Detection Using Multi-Resolution Cascaded MIMO Radar." *European Conference on Computer Vision*, 2022. [\[pdf\]](#) (*coprimary authors)
10. **[NSDI'22]** Suraj Jog, [Junfeng Guan](#), Sohrab Madani, Ruochen Lu, Songbin Gong, Haitham Hassanieh. "Enabling IoT Self-Localization Using Ambient 5G Signals." *USENIX Symposium on Networked Systems Design and Implementation*, 2022. [\[pdf\]](#)
9. **[NSDI'21]** [Junfeng Guan](#), Jitian Zhang, Ruochen Lu, Hyungjoo Seo, Jin Zhou, Songbin Gong, Haitham Hassanieh. "Efficient Wideband Spectrum Sensing Using MEMS Acoustic Resonators." *USENIX Symposium on Networked Systems Design and Implementation*, 2021. [\[pdf\]](#) [\[ACM SIGMOBILE Research Highlights\]](#)
8. **[TMTT'21]** [Junfeng Guan](#), Arun Paidimarri, Alberto Valdes-Garcia, Bodhisatwa Sadhu. "3D Imaging Using Millimeter Wave 5G Signal Reflections." *IEEE Transactions on Microwave Theory and Techniques*, 2021. [\[pdf\]](#)
7. **[CVPR'20]** [Junfeng Guan](#), Sohrab Madani, Suraj Jog, Saurabh Gupta, Haitham Hassanieh. "Through Fog High Resolution Imaging Using Millimeter Wave Radar." *IEEE Conference on Computer Vision and Pattern Recognition*, 2020. [\[pdf\]](#)
6. **[RFIC'20]** [Junfeng Guan](#), Arun Paidimarri, Alberto Valdes-Garcia, Bodhisatwa Sadhu. "3D Imaging using mmWave 5G Signals." *IEEE Radio Frequency Integrated Circuits Symposium*, 2020. [\[pdf\]](#) [\[Best Industrial Paper Finalists\]](#)

5. [NSDI'19] Suraj Jog, Jiaming Wang, Junfeng Guan, Thomas Moon, Haitham Hassanieh, Romit Roy Choudhury. "Many-to-Many Beam Alignment in Millimeter Wave Networks." *USENIX Symposium on Networked Systems Design and Implementation*, 2019. [\[pdf\]](#)
4. [VLSI'19] Thomas Moon, Junfeng Guan, Haitham Hassanieh. "Online Millimeter Wave Phased Array Calibration Based on Channel Estimation." *IEEE VLSI Test Symposium*, 2019. [\[pdf\]](#)
3. [SIGCOMM'18] Sheng Shen, Nirupam Roy, Junfeng Guan, Haitham Hassanieh, Romit Roy Choudhury. "MUTE: Bringing IoT to Noise Cancellation." *ACM SIGCOMM*, 2018. [\[pdf\]](#)
2. [IMS'17] Brandon Arakawa, Liuqing Gao, Yansong Yang, Junfeng Guan, Anming Gao, Ruochen Lu, Songbin Gong. "Simultaneous Wireless Power Transfer and Communication to Chip-Scale Devices." *IEEE International Microwave Symposium*, 2017. [\[pdf\]](#)
1. [IMS'17] Ali Kourani, Yong-Ha Song, Brandon Arakawa, Ruochen Lu, Junfeng Guan, Anming Gao, Songbin Gong. "A 150 MHz Voltage Controlled Oscillator using Lithium Niobate RF-MEMS Resonator." *IEEE International Microwave Symposium*, 2017. [\[pdf\]](#)

POSTERS AND ARTICLES

4. [SIGCOMM'22 Poster] Junfeng Guan, Suraj Jog, Sohrab Madani, Ruochen Lu, Songbin Gong, Haitham Hassanieh. "Enabling IoT Self-Localization Using Ambient 5G mmWave Signals." *ACM SIGCOMM*, 2022. [\[pdf\]](#)
3. [GetMobile'21] Junfeng Guan, Jitian Zhang, Ruochen Lu, Hyungjoo Seo, Jin Zhou, Songbin Gong, Haitham Hassanieh. "Efficient Wideband Spectrum Sensing Using MEMS Acoustic Resonators." *ACM GetMobile: Mobile Computing and Communications*, 2021. [\[pdf\]](#)
2. [IEEE D&T'20] Thomas Moon, Junfeng Guan, Haitham Hassanieh. "Know Your Channel First, then Calibrate Your mmWave Phased Array." *IEEE Design & Test Magazine*, 2020. [\[pdf\]](#)
1. [MobiCom'18 Poster] Sheng Shen, Nirupam Roy, Junfeng Guan, Haitham Hassanieh, Romit Roy Choudhury. "Networked Acoustics Around Human Ears." *ACM MobiCom*, 2018. [\[pdf\]](#)

SELECTED HONORS AND AWARDS

ACM SIGMOBILE Research Highlights	2021
Qualcomm Innovation Fellowship [website]	2020
RFIC'20 Industry Best Paper Finalists	2020
Highest Honors at Graduation, UIUC ECE	2017
Edward C. Jordan Award, UIUC ECE	2017

PATENTS

- L3. Saeed Reza Khosravirad, Junfeng Guan, Harish Viswanathan, Jakub Sapis. "Resource Allocation in Joint Communication and Sensing." *Patent Pending: US-20230284122-A1*, 2023.[\[pdf\]](#)
- L2. Junfeng Guan, Bodhisatwa Sadhu, Arun Paidimarri, Asaf Tzadok, Alberto Valdes Garcia. "Imaging With Wireless Communication Signals." *Patent Pending: US-20210215814-A1*, 2021.[\[pdf\]](#)
- L1. Junfeng Guan, Sohrab Madani, Suraj Jog, Saurabh Gupta, Haitham Hassanieh. "Neural Network-Based Millimeter-Wave Imaging System." *Patent Granted: US-20210192762-A1*, 2021.[\[pdf\]](#)

PROFESSIONAL EXPERIENCE

Nokia Bell Labs
Radio Systems Bell Labs Summer Intern

Jun. 2021 - Aug. 2021
Murray Hill, NJ (Remote)

- Designed a JCAS simulation system to train object detection network for traffic monitoring in 5G/6G.
- Publications & Patents: L3.

IBM Research

May. 2019 - Aug. 2019

Graduate Research Intern

Thomas J. Watson Research Center, Yorktown Heights, NY

- Designed a 5G JCAS base station that can recreate 3D radar images from reflected 5G comm. signals.
- Publications & Patents: [TMTT'21], [RFIC'20], L2.

TEACHING EXPERIENCE

- Course Designing Team - Communications Project (EPFL COM 304) Sep. 2023 - Present
- Teaching Assistant - Wireless Communications (ZJU T&E USS 2020) Jul. 2020
- Teaching Assistant - Communication Networks (UIUC CS/ECE 438) Aug. 2019 - Dec. 2019
- Lab Teaching Assistant - Communication System Lab (UIUC ECE 463) Aug. 2018 - Dec. 2018

INVITED TALKS AND TUTORIALS

- “Pushing the Capabilities of Millimeter-Wave Imaging and Sensing with AI”, Workshop on AI/ML Techniques for Wireless Comm. and Radar, *International Microwave Symposium (IMS)*, June, 2024.
- “Introduction to 4D Radar: Hardware, MIMO, Signal Processing, Dataset, and Neural Network”, Tutorial, *IEEE Intelligent Vehicles Symposium (IV)*, June, 2024.

SERVICES

- Shadow Program Committee - ACM SenSys 2022
- Conference Reviewer:
 - IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023, 2024
 - IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2024
 - IEEE Vehicular Technology Conference (VTC) 2023 Fall
 - International Conference on Computer Vision (ICCV) 2023
 - European Conference on Computer Vision (ECCV) 2022
 - IEEE Globecom Workshops 2022
- Journal Reviewer:
 - IEEE Transactions on Signal Processing (TSP)
 - IEEE Transactions on Microwave Theory and Techniques (TMTT)
 - IEEE Transactions on Instrumentation and Measurement (TIM)
 - IEEE Transactions on Mobile Computing (TMC)
 - IEEE Network Magazine
 - IEEE Access
 - International Journal of Wireless Information Networks

SUPERVISION OF JUNIOR RESEARCHERS

- Camilla De Zan. EPFL Master's Thesis Project, Spring 2024
- Yiduo Hao. “Bootstrapping Autonomous Radars with Self-Supervised Learning.” *arXiv*, 2023.
- Franck Khayat. EPFL Master's Semester Project, Fall 2023
- Cyril Golaz. EPFL Master's Semester Project, Fall 2023
- Dhairya Jigar Shah. EPFL Summer Intern, Summer 2023
- Chagari Koushal Kumar Reddy. EPFL Summer Intern, Summer 2023
- Jeremy Joël Weill. “CubeSAT X-Band SDR Design.” *EPFL Master's Semester Project*, 2023.

- Samah Hussien. “Exploiting Virtual Array Diversity For Accurate Radar Detection.” *ICASSP*, 2023.
- Ishani Janveja. “WINC: A Wireless IoT Network for Multi-Noise Source Cancellation.” *IPSN*, 2022.
- Waleed Ahmed. “Accurate Detection for Self-Driving Cars Using Multi-Resolution MIMO Radar.” *UIUC CS Master’s Thesis*, 2022.
- Jitian Zhang. “Mitigating Radar Interference via Time Hopping.” *UIUC ECE Master’s Thesis*, 2022.
- Akshay Bhamidipati. “A Wireless Approach to Streaming of XR Traffic.” *UIUC Undergrad. Thesis*, 2022.
- Karthik Prasad. “Real-Time Spoofing of Radio Altimeters.” *UIUC Undergrad. Independent Study*, 2022.
- Hailan Shanbhag. “A Scalable Software-Defined Phased Array Using Commercial 60 GHz Chipset.” *UIUC Undergrad. Thesis*, 2021.
- Luting Chen. “High-Resolution Millimeter-Wave Imaging for Humans.” *UIUC Undergrad. Thesis*, 2019.

EXTRACURRICULAR & LEADERSHIP ACTIVITIES

UIUC US-China Innovation and Development Forum <i>Co-Founder & Executive President</i>	Jan. 2016 - Apr. 2017 <i>Urbana, IL</i>
New Student Program at UIUC <i>Orientation Leader</i>	Apr. 2015 - Sep. 2016 <i>Urbana, IL</i>
Chinese Students and Scholars Association (CSSA) at UIUC <i>Vice President, Secretary General</i>	Aug. 2013 - May 2017 <i>Urbana, IL</i>
Overseas China Education Foundation (OCEF) <i>Volunteer Teacher</i>	Jul. 2014 - Aug. 2014 <i>Huining County, Gansu Province, China</i>

REFERENCES

- **Prof. Haitham Hassanieh**
Associate Professor, École Polytechnique Fédérale de Lausanne (EPFL)
School of Computer and Communication Sciences
Website: <https://people.epfl.ch/haitham.alhassanieh>
- **Prof. Romit Roy Choudhury**
Professor, University of Illinois Urbana-Champaign
Department of Electrical and Computer Engineering & Computer Science
Website: <http://croy.web.engr.illinois.edu>
- **Prof. Saurabh Gupta**
Assistant Professor, University of Illinois Urbana-Champaign
Department of Electrical and Computer Engineering
Website: <http://saurabhg.web.illinois.edu>
- **Prof. Songbin Gong**
Associate Professor, University of Illinois Urbana-Champaign
Department of Electrical and Computer Engineering
Website: http://ilirm.ece.illinois.edu/a_professor.html
- **Dr. Alberto Valdes Garcia**
Principal Research Scientist, IBM T. J. Watson Research Center
Manager, RF Circuits and Systems
Website: <https://researcher.watson.ibm.com/researcher/view.php?person=us-avaldes>