

Haofan Lu

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RESEARCH INTERESTS

- Signal processing, Machine learning, Internet of things, Wireless sensing and communication systems

EDUCATION

University of California, Los Angeles

Sept. 2021 – June 2026 (Expected)

PhD student in Computer Science Department

- Advisor: Professor Omid Abari
- **Research focus areas:** Internet of Things, Machine Learning

University of Illinois at Urbana-Champaign

Sept. 2017 – June 2021

B. S. in Electrical Engineering from University of Illinois at Urbana-Champaign

GPA: 3.88

- Thesis Advisor: Professor Romit Roy Choudhury
- Thesis Project: Indoor Localization with the Assistance of Ultrasonic Beacons [[link](#)]

Zhejiang University

Sept. 2017 – June 2021

B. Eng. in Electrical Engineering and Automation from Zhejiang University

GPA: 3.94

- Capstone Project: A crowd-sourcing urban air quality monitoring system on bike (**Best Social Impact Award**)

SELECTED PUBLICATIONS

- **[SIGCOMM'23]** [Haofan Lu](#), Mohammad Hossein Mazaheri, Omid Abari, "A Millimeter Wave Backscatter Network for Joint Communication and Localization". Acceptance rate: $71/323 = 22.0\%$.
- **[IEEE Internet of Things Journal]** Ali Abedi, [Haofan Lu](#), Alex Chen, Charlie Liu, Omid Abari, "WiFi Physical Layer Stays Awake and Responds When Should Not". IF: 10.6
- **[HotNets'22]** [Haofan Lu](#), Tianxiang Li, Reza Rezvani, Ali Abedi, Omid Abari, "Bringing WiFi Localization to Any WiFi Devices", Acceptance rate: $32/104 = 30.8\%$.
- **[International Journal of Heat and Mass Transfer 2022]** [Haofan Lu](#), Yi Yu, Ankit Jain, Yee Sin Ang, Wee-Liat Ong, "Deep learning techniques elucidate and modify the shape factor to extend the effective medium theory beyond its original formulation", IF:5.584
- **[Under Submission]** [Haofan Lu](#), Tianxiang Li, Reza Rezvani, Mohammad Hossein Mazaheri, Omid Abari. "Enhancing WiFi Protocols via Smarter Antenna Design".

INDUSTRY EXPERIENCE

Samsung Research America - Standard and Mobility Innovation Lab

June. 2023 – Spet 2023

Research Intern

- **Project:** WiFi-based velocity estimation and tracking for Ambient Intelligence
- Developed a indoor device-free tracking system based on WiFi sensing and filed a patent for the code and artifacts.

SELECTED RESEARCH PROJECTS

Wireless Channel Predication using Machine Learning

Feb. 2023 – Present

- Simulate WiFi Channel Impulse Response (CIR) using ray-tracing simulation in Wireless Insite and MATLAB.
- Designed a Machine Learning pipeline to predict the CIR based on a few measurements.
- Implemented the pipeline in PyTorch and conducted experiments using simulation data.

Millimeter Wave Backscatter Integrated Sensing and Communication for IoT

Jun. 2022 – Feb. 2023

- Designed and implemented a low-power millimeter wave backscatter system for IoT applications.
- Designed a novel modulation scheme that utilize the frequency scanning antenna to enable two-way communication.
- System achieves cm-level localization and up to 40 Mbps two-way communication with power consumption of 32 mW and 18 mW

Enhancing WiFi Communication and Sensing using Smart Antenna

March 2022 – Sep. 2023

- Design and Fabricated a Frequency Scanning Antenna (FSA) at WiFi band (5.8GHz)
- Integrate the antenna with the latest WiFi standard (802.11ax) to enhance communication range and data rate
- Enable device localization with submeter-level accuracy using a single transceiver chain.

PROGRAMMING LANGUAGES & SKILLS

- Languages: Python, MATLAB, C/C++, JAVA, JavaScript, Verilog, SystemVerilog, HTML, CSS, Bootstrap.
- Frameworks & Platforms: **PyTorch**, ESP-IDF, GNU Radio, Django, Weights & Biases, MySQL, InfluxDB, Docker
- Softwares: Unity, FreeCAD, Blender, Wireless Insite, WaveFarer