

# Haofan Lu

Email: [haofan@cs.ucla.edu](mailto:haofan@cs.ucla.edu) | Phone: (310) 622-2943 | Homepage: [luhaofan.github.io](https://luhaofan.github.io)  
404 Westwood Plaza, ENG VI Room 497, Los Angeles, CA 90095

## RESEARCH INTERESTS

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

## EDUCATION

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### 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

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- **[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:  $32/104 = 30.8\%$ .
- **[Under Submission]** [Haofan Lu](#), Tianxiang Li, Reza Rezvani, Mohammad Hossein Mazaheri, Omid Abari. "Enhancing WiFi Protocols via Smarter Antenna Design".

## INDUSTRY EXPERIENCE

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### Samsung Research America - Standard and Mobility Innovation Lab

June. 2023 – Sep. 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

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### Wireless Channel Predication using Machine Learning

Feb. 2023 – Present

- Simulate WiFi Channel State Information (CSI) using ray-tracing simulation in Wireless Insite and MATLAB.
- Designed a Deep Learning pipeline based on Neural Radiance Field (NeRF) to learn the radiation of WiFi signal.

### 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

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- 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