

# Hao(Howard) Yao

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## EDUCATION

### University of California, Berkeley

*Bachelor of Science, Electrical Engineering & Computer Science (Major GPA: 3.9/4.0)* 08/2025 - 06/2027

### Mt. San Antonio College

*Associate of Science, Mathematics & Computer Engineering, (Major GPA: 3.87/4.0)* 08/2023 - 06/2025

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## EXPERIENCE / PROJECTS

### Lawrence Berkeley National Laboratory (LBNL)

Berkeley, CA | Jun 2024 – Present

#### *Student Intern / Research Assistant*

- Designed and developed a portable embedded sensor platform using **Raspberry Pi** and **5G NR cellular module (Quectel RM502Q-AE)** for real-time collection/transmission of environmental data in remote regions.
- Designed end-to-end **MQTT-based** data pipeline with **Grafana visualization**, enabling near real-time (<1–2 s latency) transmission and monitoring of sensor and **RSSI** data streams.
- Developed **Kriging-based spatial interpolation models** for RSSI mapping, improved coverage prediction accuracy by ~20–30% vs **naive interpolation** and supported **deployment across >1 km<sup>2</sup> terrain**
- Integrated system with **Quantum Geographic Information System(QGIS)** for geospatial analysis, processing and **visualizing >1000 geo-tagged data points** per deployment.

### Robotics Teams (FIRST & VEX Robotics)

Diamond Bar, CA | Jun 2021 - May 2025

#### *Team Captain / Electrical Engineer/ Software Engineer*

- Developed **autonomous** and **teleoperated robot control** systems in C++, integrating **sensor feedback** for navigation, manipulation, and scoring under competition constraints
- Built data analysis tools (**React, TypeScript, MongoDB**) to support **match strategy across 20+ teams**; designed custom robot components using Fusion 360 and OnShape for rapid prototyping.
- **Led a team of 4–6 members** across **mechanical, electrical, and software domains** to deliver competition-ready robots, contributing to full development lifecycle from design to testing

### Acoustic Positioning System (APS)

Berkeley, CA | Oct 2025 - Nov 2025

#### *Python, Signal Processing, Numerical Methods*

- Implemented **cross-correlation algorithms** to extract time-of-arrival offsets from **multi-beacon acoustic signals**, enabling robust **signal separation** in noisy environments
  - Processed and averaged **100k+ sample signals** to reduce noise and **improve peak detection accuracy** across repeated signal periods.
  - Constructed and solved an overdetermined system using least squares to estimate 2D receiver position from TDOA, achieving **high-accuracy localization in simulation and real data tests**.
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## Technical/Honors

- Co-Author: [A 60 GHz Millimeter-Wave FMCW Radar System for Real-Time Observations in Remote Outdoor Environments](#)
  - IEEE Sensor Applications Symposium 2025, [Best Poster Award](#)
  - [LBNL 2024-2025 Recognition of Excellence Award](#)
  - VEX Robotics Excellence Award & Tournament Champion / Finalist (VEX / FRC Competitions)
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## ADDITIONAL SKILLS

C/C++, Python, RISC-V & Intel x86 Programming, Embedded Systems (Raspberry Pi, STM32, ESP32), MQTT / Wireless Communication, Linux, Sensors & IoT Integration, Signal Processing, PCB Design (KiCad), UART / SPI / I2C/CAN BUS, Git, Data Structures & Algorithms