HOWARD ZHU

howardzhu8@gmail.com | Los Angeles, CA | www.linkedin.com/in/howard-zhu21 | www.howard-zhu.com | (909) 234-8237

EDUCATION

University of California, Los Angeles (UCLA) **Los Angeles, CA**

Bachelor of Science, Computer Science *June 2025*

GPA: 3.704/4.0

Notable Courses: Deep Learning for Computer Vision, Software Construction (Full Stack), Computer Networking, Machine Learning, Programming Languages, Algorithms and Complexity

PROFESSIONAL EXPERIENCE

Internet Research Laboratory, UCLA in collaboration with the University of Memphis **Los Angeles, CA**

Undergraduate Researcher *July 2023 - Current*

- Developed an application to securely transfer medical metadata using the Named Data Networking (NDN) protocol.
- Devised rigorous testing software to ensure optimal and correct operation.
- Employed attribute-based encryption to secure data contents instead of the data container.

CS97, UCLA **Los Angeles, CA**

Teaching Assistant *June 2024 - July 2024*

- Taught students machine learning in Python through 8 Colab Notebooks and 4 theory and programming assignments.
- Supervised students through homework and projects involving Pandas, Scikit-Learn, and PyTorch.
- Led highly rated daily discussion sections with cohorts of 12 students for 3 hours with added office hours.

Structures-Computer Interaction Laboratory, UCLA **Los Angeles, CA**

Undergraduate Researcher *January 2023 - June 2024*

- Led software development in a team of four, for a robotic platform for autonomous precision agriculture applications.
- Integrated depth camera systems for data collection and autonomous navigation through fields.
- Designed control system and software for facilitating movement and long-distance communication over LoRa.

PROJECTS

Losing My Marbles | JavaScript, WebGL

- Created a marble maze game with complex efficient collision detection and simulated physics.
- Levels were modeled in Blender and imported so shadows and textures could be mapped.

Media Gestures | Python (Pytorch)

- Trained a model to learn a set of hand gestures so when performed, an action would be taken on a computer to control media (play, pause, skip, etc.)

Bruin To Go | Node.js, React, Google Firebase, HTML

- Developed a full stack app enabling a user to put up a request for a reward and others may accept to fulfill those requests to acquire rewards.

Bruin SMV CAN | C++, Arduino

- Programmed a CAN Bus wrapper library for Bruin Club Racing so use with microcontrollers such as ESP32, Teensy, and RP2040. Published in Arduino's library manager for public availability.

Dating App, Radix Tree | C++

- Built a dynamically allocated radix tree data structure mapping thousands of strings to any templated value
- Simulated a dating app taking in large amounts of user data and matching users to others of compatible traits

Audio Visualizer | Python

- Constructed an LED audio visualizer using fast Fourier transformations on a Raspberry Pi 4 and WS2812B LEDs
- Expanded to enable custom effects streamed over sACN to remote nodes for sequenced light shows.

SKILLS AND CERTIFICATIONS

- **Programming Languages**: C++, Python, JavaScript (Node.js, React, Next.js), x86 Assembly
- **CompTIA A+ Certified**: Skills for IT troubleshooting using peripherals, operating systems, and computer hardware

EXTRACURRICULARS

- **Bruin Racing** (Super Mileage Electric Vehicle): Continual development of a hyper efficient electric car from the ground up. Wrote essential code for **CAN bus** communication using **Teensy microcontrollers**. Self-hosted full-stack web application for data collection, analysis, and real-time monitoring using **Django, PostgreSQL, and MQTT.**
- **Bruin Club Tennis** (Membership Director): Managing current and prospective members, ensuring all paperwork is properly completed as well as providing clear communication between members and the board of directors.
- **Home Lab**: Managing a residential deployment of pfSense, Unraid Network attached Storage, and Home Assistant for members of the local network.