HONGCHANG KUANG

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EDUCATION

University of California, Los Angeles (UCLA), Los Angeles, CA Expected June 2024

Bachelor of Science

- Major: Computer Engineering. Minor: Data Science Engineering
- Cumulative GPA: 3.86/4.0 Major Upper Division GPA: 3.98/4.0
- Relevant course work: C++ Programing, Algorithm and Data Structure, Computer Architecture, Digital Circuits and System, Electrical and Electronic Circuits, Operating System, Signals and Systems, Telecommunication and Data Communication Network, Digital Signal Processing, FPGA Design, Neural Signal Processing
- Awards and honors: Five times Dean's Honor List of Henry Samueli School of Engineering and Applied Science: Winter 2021, Spring 2021, Fall 2021, Spring 2022, Spring 2023

PROFESSIONAL EXPERIENCE

I2BL at UCLA | *Undergraduate Research Intern* September 2023 - Present

- Conducted microfluidic devices and system research in I2BL at UCLA with professor Sam Emaminejad; mainly focused on Ferrobotic System development to perform massive parallelized and sequential fluidic operations at small length scale in a collaborative manner
- Devised and programmed Ferrobotic control platform using Python; achieved Ferrobot path planning, scaling, and optimization at the software and embedded system firmware level; improved Ferrobot path programming efficiency by 50%

Amazon Web Service | *Software Development Engineer Intern* June 2023 - September 2023

- Collaborated with engineers in software and system design process in AWS Elastic Container Service organization; designed and implemented load testing module for production level API using Java17 and commons math probability library
- Achieved real-life stochastic traffic pattern generation for API transaction and random AWS credentials sampling features with configurable probability model in the project; integrated the project under organization Gamma testing environment with two production-level APIs testing procedure
- Drafted 16 pages technical design document with system structure graph and call sequence diagrams; presented the final demo in front of whole ECS organization

Daily Bruin | *Internal Tool Developer* June 2022 - June 2023

- Lead the backend intern team to build MERN stack projects; arrange and conduct weekly work meeting; coordinate backend workflow and work distribution
- Design backend APIs and systems using Node.js and Express.js; maintain MongoDB Atlas database and AWS S3 Bucket deployment
- Collect and review user feedbacks from Daily Bruin editors; integrate corresponding features into the projects

IEEE at UCLA | *General Member* October 2021 - June 2023

- Collaborated with 3 other team members to develop and learn basic skills in electrical and computer engineering, including circuits, Arduino design and C++ programming; designed and built autonomous vehicle and game console projects using Arduino, L293D control unit, and HC-SR04 ultrasonic sensor; presented the projects in the final capstone project assessment and contest of autonomous vehicle (OPS Group 2021-2022)
- Devise maze-solving robotics with 2 other team members using STM32 microcontroller, IR sensors, and L293D motor control unit; design control logic and sensing firmware in STM32 Cube IDE (Mircromouse Group 2022-2023)

Vennity, Inc. | *Backend Development Intern (volunteer, no contract)* January 2022 - June 2022

- Formulated entrepreneurship project lead by 2 graduate students and alumni in UCLA Andersen School of Management; cooperated with 3 other interns and artist Matty Davis to design web-based application related to NFT (non-fungible token) viewing and exhibition
- Combined Web-3 and NFT related technical ideas and marketing strategy to devise entrepreneurship plans; formulated and implemented application backend and database with Bubble.io and Node.js; solve NFT contracts reading and sorting problems in Bubble.io; present project demos in final demo day

PROJECTS

SinkOrganics | *Embedded System Lead* January 2023 - Present

- Originated MVP device for startup founded by 6 UCLA students; engineered and fabricated a household device integrates both the common in-sink garbage disposal systems and the household countertop composting machines; automates the waste disposal and composting process to democratize sustainable backyard produce through in-house composting

- Lead embedded system software program team with STM32 controller platform; construct device firmware such as motor, heat pad and temperature sensor using protocols including GPIO pins and timers; reduce system energy consumption by 15%
- Winner of the environmental track at LA Hackathon 2022; Winner of 2022 China-US Young Maker Competition (1st prize out of 1500+ projects); 2023 UCLA Anderson School of Management Easton Center Innovation Challenge Finalists; 2023 CMU Venture Competition Finalists

AIPet | *Embedded System Developer* September 2023 - Present

- Designed IoT based smart devices and network to monitor pet movement and automatic notification and report generation in the household environment with Raspberry Pi platform; partnered with 3 other students in system design and analysis;
- Focused on IoT devices network design and deployment; programmed MQTT protocols for IoT messaging and data communication; enabled image recognition with OpenCV and motion detection with BerryIMU and piezo sensors; increased the recognition accuracy by 20% while decreasing the energy consumption by 30%

Carbon | *Backend Developer* June 2022 - September 2023

- Constructed a no-code platform using MERN stack and Grape.js for Daily Bruin editors to design and write online static website; mainly focus on backend systems and database development and design using Node.js and Express.js
- Hold weekly meeting with backend team on examining the project logs and editors feedbacks; offer solutions to frontend features including user classification, projects sorting, and projects updates caching
- Integrate AWS S3 Bucket into backend system for automatic web page deployment; add ChatGPT endpoint for AI assistance in web page design and enhancement; improve Daily Bruin online editors design efficiency by 30%;

8-bit Carry Lookahead Adder | *Hardware Developer* March 2023 - April 2023

- Partnered with another computer engineering student to design a 8-bit carry lookahead adder digital circuit using Cadence Virtuoso with 90 nm standard cell; optimized circuit performance through gate and transistor sizing and logic optimization; tested the circuit performance using Cadence ADE explorer
- Achieved 1GHz speed with power consumption of 8.56 FJ; ranked 1 out of 40 groups in ECE 115C course

Taiko no Tatsujin | *Hardware Developer* October 2022 - December 2022

- Collaborated with two students to construct a reaction-time-based rythme game with software interface of Java and piezo sensing hardware device for human computer interaction project
- Built piezo sensing circuit prototype using breadboard; analyzed the sensing signal using FFT and plotted it with waterfall graph; performed signal recognition using SVM in Weka library; improved sensing and recognition accuracy by 30%
- Accomplished 18 out of 20 in robustness and accuracy test; ranked among top favorite projects in ECE 188 course

Autonomous Rover | *Hardware Developer* April 2022 - May 2022

- Led a group of 3 members in IEEE OPS 2021-2022 capstone project; designed and implemented an autonomous rover following a target object using Arduino, L293D control unit and HC-SR04 ultrasonic sensor with PID control logic
- Recorded a demo and showcased the project in group-wise competition; achieved top 10 in final capstone project assessment of autonomous vehicle contest in 2021-2022 IEEE OPS group

PUBLICATIONS

Insights of Artificial Intelligence Application in Healthcare | *Author* August 2019

- Explain and analyze basic artificial intelligence utilities in healthcare industry, including surgery, radiology, etc.; concentrated on several creative applications of artificial intelligence in healthcare and discussed future trend;
- Published at International Journal of Science, Volume 8 August 2019: https://www.ijsciences.com/pub/article/2157, doi: 10.18483/ijSci.2157

TECHNICAL SKILLS

- Programing Languages: C++ | C | Java | Python | JavaScript | Verilog | MATLAB
- Software Development Skills: Shell command and scripting, MERN stack development, Git, Linux/Unix OS, Visual Studio Code, Emacs, AWS S3 Bucket, AWS Lambda, Numpy, Pandas, Matplotlib, OpenCV
- Hardware Development Skills: Arduino design, Raspberry Pi design, FPGA design, Xilinx Vivado design suite, Breadboard circuits design, Digital circuit design, Cadence Virtuoso design suite, STM32 microcontroller and Cube IDE, 3D printing with Creality Slicer and printer, Computer Aided Design

CERTIFICATIONS

- React, Node.js, Express, & MongoDB - The MERN Fullstack Guide Course Certification, issued by Udemy
- Verilog for an FPGA Engineer with Xilinx Vivado Design Suite Course Certification, issued by Udemy