

Minghui (Scott) Zhao

(858) 405-3316 • Apt. 5307, 3535 Lebon Dr., San Diego, CA, 92122 • scott@scottz.net

Education

University of California San Diego – La Jolla, CA

August 2016–December 2020

Major: Electrical Engineering Minor: Mathematics

Expected degree: B.S. Electrical Engineering

Cumulative GPA: 3.719

Relevant coursework: C, C++, Python for Data Analysis, Data Networks, Computer Architecture, Embedded Systems, Rapid Prototyping, Analog Design, Digital Design, Linear System Fundamentals

Academic Experience

Bharadia Lab UCSD – La Jolla, CA

April 2019–Present

Research Assistant

- Developed an accurate indoor tracking system employing an array of ultra-wideband (UWB) radio frequency (RF) transceivers to make virtual reality system tracking feasible in non-line-of-sight situations
- Worked on an embedded system that controls the UWB transceivers and the PCB for a transceiver array
- Processed the RF signal data and analyzed the performance and limits of the system
- Compared and optimized various methods and algorithms in angle of arrival estimation and location solving to reduce the median localization error to 5 cm

Talke Lab UCSD – La Jolla, CA

April 2017–June 2019

Research Assistant

- Developed an embedded, wireless, hand and ergonomic motion tracking system to improve the surgical operation training and ergonomic health monitoring of medical students and doctors
- Designed and fabricated a PCB for the system and fitted it into a 3D-printed soft watch case
- Compared and analyzed performance and data fidelity on TCP/UDP transmitting protocols and implemented buffering and data recovery algorithms to transmit data at tripled rate while eliminating data loss

UCSD Electrical and Computer Engineering Department – La Jolla, CA

September 2016–Present

Undergraduate Teaching Assistant

- As a teaching assistant for ECE 5 (Introduction to ECE) and ECE 16 (Rapid Software & Hardware Design) beginning in my freshman year, acquired a 99.5% student recommendation rate in a total of 13 quarters worked
- Led lab section meetings and announcements in addition to other duties, including coordinating tutors on the preparation of material, organizing class project competitions, and developing lab instructions and assignments
- Trained students in hands-on skills, including 3D CAD and printing, PCB design, laser cutting, and soldering
- Interacted with students by answering technical questions, debugging circuits and programs, and inspiring and assisting them in developing their own projects; fostered essential skill sets in more than 1,000 students to facilitate innovative projects and to inspire a practical interest in ECE

Projects (see many more at scottz.net/projects)

AutoPark (github.com/zhaomh1998/AutoPark)

January 2019–March 2019

- Developed a multi-level parking structure model with automatic car parking
- Designed and assembled seven distinct PCB prototypes with DC and stepper motor drivers and wireless microcontrollers
- Built a 3D model for the system, manufacturing and assembling it with laser cutting and 3D printing
- Programmed “node” microcontrollers to interface with sensors and drive stepper motors, enabling wireless communication with one another and with the host

Tubular Robot (scottz.net/tr)

April 2018–June 2018

- Developed an autonomous terrain exploration and mapping robot with wireless controls and a streaming camera
- Assembled the robot from scratch with a laser-cut tubular chassis and wheels and 3D-printed sensor holders
- Programmed the microcontroller to read sensors, transmit data, and react wirelessly to commands from the PC
- Developed algorithms for obstacle avoidance, autonomous driving, and terrain mapping

Real-Time Traffic Monitoring and Analysis (scottz.net/traffic)

December 2017–Present

- Programmed a script to collect and plot traffic congestion information from AMap API in real time
- Optimized the scraping server script for years of stability
- Enabled comparison of traffic data with precipitation data and analyzed weather's contribution to traffic jams

Smart Home Remote Watering (scottz.net/water)

January 2015–Present

- Built an embedded wireless system to monitor soil humidity and to water plants autonomously or remotely using mobile phones over Wi-Fi
- Enabled GSM connectivity to maintain an internet connection in the absence of Wi-Fi
- Developed a cross-platform mobile app using Flutter to control the system remotely

Publications

- Morris, K., **Zhao, M.**, Lam, J., Jacobsen, G., Horgan, S., & Talke, F. E. (2019, June). A Wearable Neck Measurement Device and Monitoring System to Improve Ergonomic Performance of Surgeons. In *Information Storage and Processing Systems (vol. 59124, p. V001T09A002)*. American Society of Mechanical Engineers.
- **Zhao, M.**, Ayyalasomayajula, R., Zhang, C., & Bharadia, D. (Under review). ULoc: Robust, Scalable and cm-Accurate UWB Tag Localization. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*.

Extracurricular Activities

- **EnVision Arts and Engineer Maker Studio Volunteer** January 2019–March 2020
Inspired students in their personal and class projects and provided hands-on training on maker tools, including laser cutting, 3D modeling and printing, PCB design, and soldering
- **YonderDeep Student Organization** September 2018–August 2019
Designed the PCB for an autonomous underwater vehicle (AUV) and improved the AUV's software by proposing and developing a more robust code logic using finite state machines; wrote programs in Python for communication between the AUV and the base station and developed PID control algorithms to control and balance the AUV during autonomous navigation and when diving to a specified depth

Honors and Awards

- Honorable Mention. LA Hacks 2019: Site 101 Big Data Award
- First Award. SD Hacks 2019: Best Use of AWS AI/ML Services
- 2020 ECE Best Tutor Award

Professional Skills and Languages

- **Software:** Proficient in Autodesk EAGLE; familiar with SolidWorks, SystemVerilog
- **Programming:** Proficient in Python, MATLAB, C, C++, LabView; familiar with Flutter, Java
- **Other:** Internet of things, embedded systems, Unix
- **Language:** English (fluent), Mandarin (native), Japanese (intermediate)
- **Certification:** Certified LabVIEW Associate Developer (CLAD)