Brandon Ho

(858) 330-9711 | b1ho@ucsd.edu | brandonho667 | bbho

Education

University of California San Diego GPA: 3.97/4.00
B.S. Computer Engineering, M.S. Intelligent Systems, Robotics & Control, Magna Cum Laude ($\sim 4\%$) *exp. Dec 2024*
- **Relevant Coursework**: Algorithms, Digital Systems, Software Engineering, Deep Learning, Operating Systems, Autonomous Vehicles, Computer Vision, Computer Architecture, Robot Systems Design & Implementation

Experience

Relativity Space Long Beach, CA
Robotics Software Engineer Intern *June 2023 - Present*
- Exposing **OPC-UA** interface on Fronius welders to real-time context for Wire Arc Additive Manufacturing
- **RTOS**: Integrated **RTnet** kernel module on network interface for real-time TCP comms on **Xenomai** RT framework
- **ROS2 Driver**: Wrote an OPC-UA driver in **C++** to read and write over RT (shared memory) and non-RT contexts
- **UI Dev**: Created web interface for weld engineers to interact with OPC-UA parameters in **TypeScript**

Garmin Brea, CA
Software Engineer Intern *June 2022 - December 2022*
- Automating release processes and mock radio UI layer on the Tuner Team (Garmin AutoOEM Radio)
- **Process Automation**: Utilized Python REST APIs to automate page generation with user-configurable metadata
- **UI Automation**: Automated mock UI creation and deployment using MQTT & Node-RED for **214 D-Bus services**

Yonder Dynamics La Jolla, CA
Software Lead *October 2020 - Present*
- Lead software dev for rover to autonomously path and perform tasks in the University Rover Competition
- **Project Management**: Leading a team of **10+ SWE w/ SCRUM** and spearheading documentation on Notion
- **Autonomous Exploration**: Implementing AR-tag detection with computer vision and researching RRT* search algorithm to update a live AR-tag probability map in C++, **increasing rover exploration speed by ∼10x**
- **Sensor Fusion**: Fusing GPS with local position from IMU and stereo camera for a **∼20% increase in accuracy**
- **Obstacle Avoidance**: Created a **ROS** obstacle detection and avoidance pipeline in C++ with **RealSense** stereo camera to efficiently convert 3D pointclouds at 30Hz into occupancy grid and output avoidance waypoints

InflammaSense UCSD ECE
Software Developer and Undergraduate Research Assistant *January 2021 - September 2022*
- Built medical device to record and analyze neural signals for early signs of sepsis, published **Scientific Reports** (link)
- **Data Pipeline**: Designing a robust asynchronous network with the ZeroMQ Python API for the wireless display, transmission, storage (PostgreSQL), analysis of neural data for an array of **100+ medical devices (∼155 Mbps)**
- **Project Management**: Documenting a comprehensive system model and **leading a team of 5+ SWE** with Asana
- **Web Development**: Developing a website to display high throughput (8 kHz) neural data with React.js & Node.js

Projects

SEMPro Bae Lab
Using Explainable AI to Learn Structure-Property Insights from Hydrogel Microscopy Images *Spring 2021*
- **Web Scraping**: Developed NLP scraping algorithm (Selenium+BeautifulSoup), compiling data from **1100+ articles**
- **Deep Learning**: Optimized and trained a ResNext model in Pytorch to predict hydrogel modulus from dataset of microscopy images, able to predict within a range of 1 log Pa with **an accuracy of ∼90%**
- **Explainable AI**: Implemented regression activation mapping on a CNN to expose learned structure-property insights

Autow Autonomous Vehicles
Autonomous tow hitching using Computer Vision *Fall 2022*
- Led a team of two mechanical and one software engineer in programming an RC car to autonomously hitch to a trailer
- **ROS2**: Built an asynch callback system with **ROS2** for seamless cohesion between driver and autonomous control
- **Computer Vision**: Utilized **OpenCV** to perform ArUco tag detection and pose estimation to perform iterative localization and path planning, resulting in a **90% hitching accuracy**

Skills

Programming Languages: Python, C++, Java, SQL, JS, PHP, HTML/CSS, TypeScript
Technologies: AWS, Git, Jupyter Notebook, Linux, Docker, Confluence, Jira, Gerrit
Frameworks: ROS2, ROS, PyTorch, ZeroMQ, MQTT, D-Bus, TimescaleDB, NumPy, Pandas, SciKit, Ansible