

# Brandon Hung

---

<https://brandonh.dev>

## Education

---

CARNEGIE MELLON UNIVERSITY

*M.S. in Electrical and Computer Engineering.* GPA: 3.91/4.0 May 2022

Relevant courses: Optimal control, robot dynamics, machine/statistical learning, state estimation, biomechanics

*B.S. in Electrical and Computer Engineering, Minor in Robotics.* GPA: 3.57/4.00 May 2021

Relevant courses: Mobile robot algorithm development, computer vision, classical control theory, artificial intelligence, robot kinematics, computer systems

## Skills

---

Programming Languages and Environments: Python, Julia, MATLAB, C++, C, JavaScript, Linux

Notable Tools: SciPy, NumPy, OpenCV, PyTorch, Eigen, ROS, Simulink, Three.js, CVXPY, SymPy, LaTeX

Electrical: SystemVerilog, microcontrollers, FPGA, soldering, basic circuit design and simulation

Mechanical and Design: CAD, machining, 3D printing, rapid prototyping

## Work and Research Experience

---

EVERYDAY ROBOTS (GOOGLE X) - CONTROLS AND ANALYSIS SOFTWARE ENGINEER SEPT 2022 - FEB 2023

- Initiated subsystem ownership of controls, actuation, and validation for new head design
- Simulated dynamics/kinematics in animation to analyze product requirements in engineering limitations
- Implemented library to generate model-based actuator dynamics

CMU ROBOTIC EXPLORATION LAB - MASTER'S RESEARCH MAY 2021-MAY 2022

- Derived hybrid dynamics models for legged walking/jumping robots in Julia; videos [here](#) and [here](#)
- Initiated DDP optimal control investigation to successfully track walking and jumping trajectories

CMU BIROBOTICS LAB - RESEARCH ASSISTANT MAY 2018-AUG 2018

- Transcribed multi-agent path planning algorithm from Java to Python for swarm robot task planning
- Benchmarked results and confirmed lab's reinforcement learning algorithm improved performance

## Projects and Activities

---

TINYRENDERER - INDEPENDENT EXPLORATION JUNE 2022-JULY 2022

- Developed C++ renderer for .obj files and textures based on Dmitry Sokolov's course; code [here](#)
- Implemented texture mapping, Gourand shading, triangle and line rasterization, shadow mapping

HOMOGENEOUS SWARMS SHAPE FORMATION SIMULATOR - INDEPENDENT EXPLORATION JAN 2021

- Created Python simulator to implement robotic swarm paper; code [here](#), video [here](#)
- Implemented [Hanlin Wang et al's](#) algorithm to have simulated agents form arbitrary shapes

AUTOMATED FORKLIFT SOFTWARE STACK - CMU COURSE 16-362 DEC 2019

- Implemented localization, planning, and control in MATLAB on robotic forklift models to move pallets
- Tied for first place in competition to accurately and quickly move pallets to target locations

ROOT OFFICER POSITION - CMU ROBOTICS CLUB AUG 2018 - AUG 2021

- Maintained servers, certificates, website, and other system infrastructure
- Created website for, helped revitalize [the Red Robot Hackathon](#), increasing engagement from 8 to 80

HUMAN-ROBOT INTERACTIVE ARM - CMU COURSE 15-112 DEC 2017

- Created control interface for robotic arm using computer vision and speech recognition in Python; video [here](#)