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 - ROBOTIC 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 BIOROBOTICS 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