

Adam Chung

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EDUCATION

Carnegie Mellon University

Bachelor of Science in Mechanical Engineering

Concentrations in: Robotic Motion Planning and Controls + Electromechanical Systems

Spring 2021

RELEVANT COURSEWORK

Special Topics: Robot Dynamics and Analysis

Electro-Mechanical Systems Design

Feedback Control Systems

Human-Robot Interaction

Gadgetry (Mechatronics)

SKILLS & FABRICATION

Programming Languages: C++, Python, Java

Application Software: ROS, MATLAB/Simulink, Linux

Simulation: Gazebo, MuJoCo

CAD: SolidWorks, Inventor

Machines: 3D Printer, Mill, Laser Cutter, Lathe, CNC

RELEVANT EXPERIENCE

Robotics Software Engineering Intern, Hello Robot Inc

Summer 2021

- Design a software testing framework using several open-source libraries for the Stretch RE1 platform.
- Focus is placed on developing small scale unit and performance tests for individual ROS packages.
- Organize client facing software assistance/development apart of a cloud-based autonomy stack created by Rocos.
- Use tools such as ROS, Gazebo, revision tracking, Unittest, Pytest, and Yappi.

Undergraduate Research Assistant, Carnegie Mellon: Robomechanics Lab

Spring 2020 – June 2021

- Assisted in the development of the planning/control stack for a robotic quadruped platform. *Advisor: Prof. Aaron Johnson*
- Implemented online foothold optimization algorithms and the unification of the ground map data structures across ROS nodes.
- Used tools such as ROS, rviz, CMake, google test, revision tracking, and doxygen.

PROJECTS

Continuous Passive Motion Device for Hand Rehab, Electro-Mechanical Systems Design (Team of five)

Spring 2021

- Designed and prototyped a continuous passive motion device for hand rehabilitation that would be low cost and interactive.
- Implemented a model-based impedance control scheme given a predefined minimum jerk trajectory generated from a task space curve, desired average velocity, and desired number of reps.
- Led the software development and controls research which ultimately lead to a Simulink model using robotic systems toolbox, and numerous libraries in C++ to interact with the low-level motor controllers.
- Awarded 'Most Innovative Project' at the final MechE department Design Expo.

Flamingobot Project, Robomechanics Lab

Spring 2020 – Fall 2020

- Focused the research on having bipedal robot mimic passive standing using minimal motor input.
- Assisted team with the mechanical design and implemented optimal control strategies based off humanoid push recovery.
- Utilized PD control for the ankles and Bang-Bang control for the hips; and generalized into LQR control for the ankles and MPC control for the hips which was more computationally taxing but much more responsive to external disturbances.
- Used tools such as MuJoCo and MATLAB for modeling/control algorithms and python for data collection.

Autonomous Grow System, Gadgetry (Mechatronics)

Fall 2020

- Created a plant growing system with automatic watering, light control, and an interactive user interface with an Arduino microcontroller and several different sensors and actuators.
- Built the design so the user has the option of interacting with numerous push buttons and a potentiometer to set the moisture and light intensity on an LCD screen; these values are then mapped to the respective control subsystems.
- Designed several different software libraries in C++ for external peripherals that did not already have them such as the water pump, push buttons, LED strips, and the water level sensor.

ADDITIONAL EXPERIENCE

Computer Science Instructor, Juni Learning

Summer 2020 – Present

- Instruct children ages 10 to 18 in different aspects of computer science and guide them through projects in C++ , Java, and Python

ACTIVITIES

Robotics Club

Fall 2017 – Spring 2021

National Society of Black Engineers (NSBE)

Fall 2018 – Spring 2021