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Adam Chung

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EDUCATION

Carnegie Mellon University *Fall 2017 – Spring 2021*
Bachelor of Science in Mechanical Engineering
Concentrations in Robotic Motion Planning/Controls and Electromechanical Systems

RELEVANT COURSEWORK

Special Topics: Robot Dynamics and Analysis
Feedback Control Systems
Electro-Mechanical Systems Design (Spring 2021)
Gadgetry (Mechatronics)
Engineering Design I
Numerical Methods

SKILLS & FABRICATION

Programming Languages: C++ (Most experienced), Python, Java
Application Software: ROS, MATLAB/Simulink, Linux
Simulation: Gazebo, MuJoCo
CAD: SolidWorks, Inventor
Machines: 3D Printer, Mill, Laser Cutter, Lathe, CNC

RELEVANT EXPERIENCE

Undergraduate Research Assistant, Carnegie Mellon: Robomechanics Lab *Spring 2020 – Present*
Advisor: Prof. Aaron Johnson

- Assist with the development of the planning/control stack for our Spirit quadruped platform.
- Focus on the implementation of online foothold optimization algorithms to act as our local footstep planner subsystem.
- Use tools such as ROS, Gazebo, CMake, google test, revision tracking, and doxygen.

PROJECTS

Flamingobot Project, Robomechanics Lab *Spring 2020 – Fall 2020*

- Research was focused on passive standing using minimal motor input.
- Assisted team with the mechanical design and implemented optimal control strategies based off humanoid push recovery.
- The two main control schemes used were PD control for the ankles and Bang-Bang control for the hips; later these were 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.
- Designed frame in Solidworks and 3D printed each subassembly. Subassemblies were fastened via threaded inserts and screws.
- 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.

Robotic Manipulator Case Study, Feedback Controls Systems *Fall 2020*

- Created a simulation framework that was focused on implementing different control algorithms for the Kinova Jaco manipulator arm using Simscape Multibody and Robotic Systems Toolbox.
- Inverse kinematics were computed for set of arbitrary waypoints to determine desired joint configurations and a trapezoidal velocity trajectory is generated.
- Implemented two popular control algorithms in the field of robotic manipulation, a computed torque controller and a PD controller.

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++ and Python.

Assistant Director of Proyecto Science, New Jersey City University *Spring 2019 – Fall 2019*

- Collaborated with a small team to run a STEM summer program for high achieving public school students in grades 7-9.
- Assisted in the planning an execution of curriculum as well as overall budget management.
- Worked firsthand in training teachers as well as interacting with parents and students on a consistent basis.

ACTIVITIES

Robotics Club *Fall 2017 – Present*
National Society of Black Engineers (NSBE) *Fall 2018 – Present*