Stephen Michael Otto

Boulder, CO | (818)-644-0754 | stot7670@colorado.edu
Portfolio: https://ottostephen88.github.io

Education:

University of Colorado Boulder (Boulder, CO) August 2021 - Present
Masters of Science in Mechanical Engineering(Robotics and Controls Emphasis) GPA: 3.84/4.0
Mech Eng Courses: Mechatronics and Robotics I, Mechatronics and Robotics II, Methods of Engineering Analysis, Advanced Linear Systems, Robust Multivariable Control, Controls Laboratory
Comp Sci Courses:Advanced Robotics, Robot Manipulation, Autonomous Systems

California State Polytechnic University, Pomona (Pomona, CA) August 2016 - May 2021
Bachelors of Science in Mechanical Engineering GPA: 3.34/4.0

Skills/Qualifications:

Software: LabView, ROS, Arduino, Raspberry Pi, SolidWorks, Matlab/Simulink, RoboDK, ADAMS, Excel/Visual Basic, MathCad, FEMAP/Nastran, Webots, JupyterLab, CORA
Coding Languages: Python, C/C++, C#, Linux, Julia, HTML
Robotics Skills: Machine Learning, Path Planning(RRT, RRT*, A*), SLAM, Computer Vision(OpenCV, Open3D)
Manufacturing: 3D printing, Laser Cutting, CNC Milling/Lathing, Tig/Mig/Stick Welding, Heat Treating, Casting

Industry Experience:

Graduate Research Assistant, University of Colorado (Boulder, CO) September 2021 - Present
-Defending thesis in the development of a robust, manufacturable, and strong robot gripper
-Designing and using a 4 bar robot gripper using a genetic algorithm and modeling the dynamic system in Matlab
-Created Github repository for easy control of the gripper in Python with force, position, and speed control
-Programming manipulator for item picking, J and L movements, servo control, and behavior trees in Python
-Data processing finger sensor data and prototyping prosthetic hands

Robotics Engineering Intern, Dorna Robotics (Upland, CA) May 2021- August 2021
-Designed, manufactured, and automated mushroom picking and cutting using the Dorna 2 robot
-Rapid prototyped parts and attachments for Dorna 2 robot using SolidWorks, 3D printing, and CNC machining
-Programmed 6 axis robot to draw an image by converting a 2D path in SVG format to a 3D path in Python

Projects:

Robust Multivariable Control of a 6-DOF Rotary Wing Aircraft April 2023 - May 2023
-Formulated a generalized plant of a rotary wing micro air vehicle for weighting functions for performance and input
-Synthesized an H∞ controller with bandwidth, tracking error, and disturbance rejection capabilities
-Analyzed nominal performance, robust performance, and robust stability with uncertainty

Automated Bartender January 2022 - May 2022
-Capable of serving 16 people at once with over 30 different common drinks
-Will dispense a cup with ice and fill with your preferred mixed drink using audio to command the robot
-Controlling 12 actuators, 6 motors, Raspberry Pi, Teensy, and hall effect sensor in Arduino IDE

Tesla Model 3 Simulation October 2021 - December 2021
-Implemented a vehicle PID controller for both steering and speed
-Navigated around the track with EKF SLAM, Lidar, and Computer Vision in Python
-Capable of parallel parking and stopping at a stop sign using computer vision

Control System Identification and Controllers January 2023 - April 2023
-System identified inverted pendulum, rotary bar, simple pendulum, flex link, and gyro in the frequency domain
-Designed a controller for each using root locus, PID control, or LQR control on hardware