Brian Lui

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EDUCATION

Cornell University, Ithaca, NY — Aug. 2015 – Dec. 2019

- Masters of Engineering in Mechanical Engineering
- Bachelors of Science in Mechanical Engineering
- GPA: 3.81
- *Relevant Coursework*: Intermediate Dynamics, Nonlinear Dynamics, Vibrations, Feedback Control Systems, Mechatronics, Autonomous Mobile Robots, Machine Learning, Embedded Operating Systems, Statics and Mechanics of Engineering Materials

EXPERIENCE

Amazon Prime Air, Seattle, Washington

Hardware Development Engineer — Mar. 2020 – Present

- Conduct material level testing as per ASTM standards and RTCA DO-160G to enable development, qualification, and compliance with requirements and regulations for carbon fiber, adhesives, and core material used in drone development
- Perform trade studies of adhesives for composite repair and foam core material for improved drone robustness
- Manage a database for material properties necessary for ANSYS analysis to improve traceability and ensure synchronization across functional teams
- Support manufacturing and production challenges through failure analysis and root cause corrective actions

Product Design Engineer Intern — Jun. 2019 – Aug. 2019

- Investigated the root cause of carbon fiber porosity on the trailing edge of the wings of the drone
- Improved manufacturing and material selection to solve porosity problem and reduce foam weight by 38%
- Automated data parsing of experimental data from materials testing using Python scripts

Teaching Assistant, Cornell University, NY — Aug. 2018 – Dec. 2019

Mechatronics (Fall '18, Fall '19)

- Led a weekly 30 student lab section about circuits and programming Arduino UNOs to eventually build an autonomous robot for collecting wooden blocks
- Held office hours and review sessions; answered questions on Piazza; graded lab reports and homework

Biorobotics and Locomotion Laboratory, Cornell University, NY — Jun. 2017 – May 2018

Undergraduate Researcher under Professor Andy Ruina

- Designed molds using SolidWorks to create the curved feet and shoes of a biped walking robot
- Manufactured the feet of the biped walking robot using wet carbon fiber, foams, and 3D printed molds
- Created a flexible PCB using Eagle that allowed pressure sensors to fit inside the feet of the robot

PROJECTS

Autonomous Mobile Robots

- Programmed an iRobot Create to handle localization using an extended Kalman filter and particle filter for a known map and using SLAM for an unknown map
- Autonomously traversed to waypoints using a rapidly-exploring random tree and feedback linearization on a known map

Applied Dynamics

- Solved for periodic trajectories for a particle subjected to a central force using trajectory optimization (single shooting, multiple shooting, collocation) through a nonlinear optimization in MATLAB

Embedded Operating Systems

- Analyzed the dynamics of a Furuta pendulum in MATLAB, then designed, machined, and controlled it using a Raspberry Pi and stepper motor in real time in Python

SKILLS

Programming Languages: MATLAB, Python, Java, C
Computer Programs: SolidWorks, Autodesk Fusion 360, ANSYS, Autodesk EAGLE, Linux
Fabrication Skills: Metal machining (lathes and mills), 3D Printing, Laser Cutting, Soldering