Rebecca E. Schwartz

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Education

Master of Engineering in Mechanical Engineering | Control of Robotic and Autonomous Systems | May 2020
Fung Institute for Engineering Leadership | College of Engineering | University of California, Berkeley | GPA: 3.67

Bachelor of Science in Mechanical Engineering | Minor in Engineering Management **|** June 2019
Pennoni Honors College **|** College of Engineering **|** Drexel University, Philadelphia, PA **|** GPA: 3.58

Projects

Sensor Robots for Emergency Response: Centrally Actuated Mobile Robot Sept. 2019 – Present
- Led hardware assembly to build Squishy Robotics' first centrally actuated tensegrity mobile robot
- Enabled face-to-face motor control using Dijkstra's shortest path algorithm and an IMU
- Hired as a full time Mechatronics Engineering Intern for May – Aug 2020

Advanced Controls

Controlling a Simulated Landing of the SpaceX Starship Rocket on Mars Dec. 2019
- Simulated a rocket landing on Mars by implementing Model Predictive Control (MPC) with ref. tracking
- Tested robustness via varying initial conditions and environmental disturbances

State Estimation of a Bicycle with the Extended Kalman Filter (EKF) Apr. 2020
- Designed an EKF in MATLAB to predict the final position of a bicycle despite various unknowns

Robotics

Low Level Control of a 3D Printed Pick and Place Robot Jan. – May 2020
- Controlled a 3D printed robot arm with a PSOC microcontroller, interfacing with C and LabVIEW
- Concepts Implemented: real-time, multitasking, interrupts, state machine, data communication

Pick and Place Challenge Jan. – March 2019
- Designed and built a 2P 3R Vex robot to compete in a pick-and-place challenge
- Coded and wired Arduino UNO in C++ to control all 5 selected motors using the serial monitor

Feedback Control with Optical Shaft Encoders Honors Project Jan. – March 2019
- Built a 2R robot to demonstrate feedback control using optical shaft encoders and Arduino UNO

Wearable Energy Harvesting Device Senior Design Project Sept. 2018 – May 2019
- Built wearable energy harvesting components using MXene coated yarns
- Engineered a yarn-coater for mass production of MXene coated yarns for knitted antennas with <$100

Computer Vision Independent Side Project June – July 2019
- Implemented an image classifier with Google's GPU Compute Engine, Jupyter Notebook, and fastai
- Hand selected 150 impressionist paintings for training and testing, receiving a 67% success rate

Advanced Programming Jan. 2018 – June 2019
- Built and implemented an automatic file organizer in Unix
- Learned object-oriented programming (OOP), data structures, and algorithms

Computer Skills

Python, MATLAB, C++, C, LabVIEW, Bash/ Unix, AutoCAD, Creo, Revit, Excel, Jupyter/ Pytorch/ fastai

Professional Experience

Mechanical Engineer Co-op | Bruce Brooks and Associates, Philadelphia, PA Apr. – Sept. 2018
- Designed mechanical and plumbing building systems using fluid mechanics and thermodynamics
- Drafted plumbing, fire protection, and mechanical systems for 10 projects in Revit

Formulations Engineer Co-op | FMC Corporation, Philadelphia, PA Apr. – Sept. 2017
- Managed the front end of a $400K project to upgrade and relocate an insecticide packaging line
- Designed and implemented a scheme to minimize a biological cleanout's water usage by 42%

Project Manager Co-op | Children's Hospital of Philadelphia, Philadelphia, PA March – July 2016
- Led a $49K mechanical project to renovate a Variable Air Volume (VAV) system
- Presented need for new piping systems after processing 268 pages of ultrasonic testing data in Excel

Leadership

- President of Drexel Honors Student Advisory Committee (HSAC) June 2018 – June 2019
- ITF Taekwondo Instructor July 2010 – Sept 2015

Coursework

Graduate
Experiential Advanced Control Design I, II
Advanced Controls I
Design of Microprocessor-Based Mechanical Systems

Undergraduate
Dynamics; Controls I, II, Micro-controls
Intro to Robotics
Advanced Programming I, Data Structures