Luke Schmitt

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EDUCATION

Carnegie Mellon University Pittsburgh, PA

Master of Science in Mechanical Engineering May 2021

QPA: 3.83/4.00

The University of Akron Akron, OH

Bachelor of Science in Mechanical Engineering, Minor in Applied Mathematics

GPA: 3.78/4.00

May 2019

PROFESSIONAL EXPERIENCE

Westinghouse Electric Company

Madison, PA

Robotics Engineer

May 2020 – March 2021

- Implemented path planning in ROS to improve mobile robot semi-autonomous teleoperation navigation stack
- Used perception algorithms to read lidar data in safety-critical velocity filters for mobile robots
- Performed conceptual design for a novel multi-robot inspection system
- Communicated with suppliers and potential vendors for product selection and market research

Moen North Olmsted, OH

Engineering Co-op

Spring 2017, Fall 2017, Summer 2018

- Developed, prototyped, and evaluated new product concepts
- Designed critical components for a high-volume product based on analytical and marketing feedback
- Used CFD tools and math models to maximize product attributes such as flow rate and pressure
- Performed finite element analysis to efficiently design critical components against pressure and consumer use

S&C Electric Chicago, IL

Electroplating Intern

Summer 2016

• Wrote standard work orders, formed relationships with suppliers, advanced operator aptitude certification system

ACADEMIC PROJECTS

The University of Akron

Carnegie Mellon University

Pittsburgh, PA

Computational Engineering and Robotics Lab • Control Project Group

Spring 2020 - Present

- Research tethered UAV controller design, simulation, and application
- Used reinforcement learning methods to create UAV control policy that rejects disturbances
- Simulate tethered UAV dynamics in PyBullet for use in reinforcement learning environment
- Design a UAV controller development platform based on PX4 and MAVROS

24-774 Advanced Control Systems Integration • Model Predictive Control Hardware Integration

Fall 2020

Fall 2020

- Wrote an MPC C++ application that achieved position and balance control of a two-wheeled robot
- 24-787 Machine Learning & Artificial Intelligence <u>Tethered Quadcopter Reinforcement Learning</u>

Learned a stabilizing controller for a tethered drone simulated in PyBullet using reinforcement learning methods

16-899 Adaptive Control & Reinforcement Learning • Improving State Estimation Through Filter Learning Spring 2020

• Improved state estimation of a simulated quadcopter using machine learning techniques

16-868 Biomechanics & Motor Control • Modeling Bipedal Balance Strategies

Fall 2019

Modeled a robust 2D bipedal controller using Simulink that recovers standing balance under disturbances

Senior Design Project • Autonomous Combat Robot

Akron, OH

- Designed, built, and analyzed a platform for the development of an autonomous combat robot
- Won first place at senior design showcase for Health, Robotic, and Manufacturing System Design

NASA Robotic Mining Competition Team • ME/EE Divisions & Treasurer

Fall 2015 - Spring 2019

Spring 2018 - Spring 2019

Lead the design and fabrication of the robot's locomotion and excavation systems and LED driver PCB

Biomedical Engineering Design Team • President & Various Projects

Fall 2015 - Spring 2019

Created and delivered tools and toys for children in the local community with disabilities

SKILLS

Programming: Advanced - C++ (Eigen, Boost), Python (NumPy, SciPy), C | Intermediate - JavaScript Applications: Advanced - MATLAB, Simulink, SolidWorks, Creo | Intermediate - ANSYS FEA, EAGLE PCB Control Systems (Classical, PID, LQR, MPC), Robot Operating System, Simulation, Linux, Reinforcement Learning (OpenAI), Localization & Mapping, Kinematics & Dynamics, OOP