

Christopher Cameron Zawacki

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EDUCATION

Ph.D in progress in Electrical Engineering 2018-Present
University of Maryland College Park

M.S.E in Robotics 2016-2018
University of Pennsylvania

B.S.E Double Major in Mechanical Engineering and Computer Science 2013-2017
University of Pennsylvania

Minor in Mathematics 2017
University of Pennsylvania

TECHNICAL SKILLS

- **Areas of Focus:** Embedded Systems, Mechatronics, Machine Learning, Control Theory
- **Experienced With:** Robotic Operating System, Solidworks Computer Aided Design, Printed Circuit Board Design, Field Programmable Gate Arrays, Machine shop experience, Composite Materials
- **Languages:** C, Verilog, C++, Java, Matlab, Python, C#, JavaScript, Coq, HTML, CSS

EXPERIENCE

Electrical Engineering Ph.D Teaching Assistant 2018-Present
University of Maryland College Park

- **Advanced FPGA Design** - Projects emphasize using microcontrollers on FPGAs for control, sensing, and communication through various I/O devices.
- **Autonomous Control of Interacting Robots** - The students work in teams to develop and construct robotic platforms to accomplish self defined tasks.
- **Independent Research** - Directly advised a senior undergraduate's research project. The work focused on developing a mobile robotic platform to aid in research directed at designing robust personal robotic systems.
- **Digital Logic and Introduction to FPGAs** - Introduction to the design, construction, and characterization of digital circuits containing logic gates, sequential elements, oscillators, and digital integrated circuits.

Kodlab Research Assistant - GRASP subsidiary 2015-2018
University of Pennsylvania

- Researched constant voltage, gait stabilizing leg design
- Designed the mechanical structure and wrote the controller software for a new quadrupedal robot
- Explored multiarmed bandit style gait optimization on the new quadrupedal robot
- The resulting paper can be found here: www.camzawacki.com/projects/bandit

Mechanical Engineering Teaching Assistant 2017-2018
University of Pennsylvania

- **Mechanical Junior Fall Lab** - The first of a two-semester junior level laboratory sequence. The technical content includes aerodynamics, applied fluid systems and structural analysis.
- **Mechanical Junior Spring Lab** - This is the second of a two-semester junior level laboratory sequence. The technical content is connected multimodal transient heat transfer and dynamic systems modeling.

PROJECTS

Electronics for Mechanical Engineers

Current

- Writing an introductory guide on basic circuitry for UPenn's mechanical labs
- Starts with basic circuit components (resistors, capacitors, and inductors) and works up to RCL circuits and operational amplifiers in active filters

pAInter

Current

- Modifying custom 3D printer into a painting platform for an AI agent
- Developing a reinforcement learning algorithm for continuous state and action spaces

Peregrine Parcel - The OXcopter

Completed

- University of Pennsylvania senior design class project
- Our team developed a novel flight vehicle intended as a personal delivery system
- Link: www.camzawacki.com/projects/oxcopter

Autonomous hockey robots with custom bathroom PCBs

Completed

- Took advantage of an easy project to learn how to use off-the-shelf chemicals to etch custom PCBs
- Designed a modular and stack-able board layout with microcontroller breakout, custom H-bridge, and sensor layout board
- Link: www.camzawacki.com/projects/pcb_etching

Learning in Mobile Service Robots

Completed

- Project focused on making a general use service robot for personal or workplace use cases
- My team developed learning capabilities such as object distribution within a map and adaptive traffic flow patterns based on observations
- As a final demonstration we implemented a mail delivery system that was able to ride the elevator and recognize recipients
- Link: www.camzawacki.com/projects/learning

Hemoglobetrotter - Hospital blood bag delivery system

Completed

- Designed and built an autonomous transport robot capable of traveling speeds of 3-4 mph with a max payload of 35lb
- LiDAR based navigation system running a RANSAC algorithm for wall detection.
- Link: www.camzawacki.com/projects/hemoglobetrotter