SEAN GILLEN

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EDUCATION

University of California Santa Barbara September 2017 - March 2022 (Expected)
MS/PhD Electrical And Computer Engineering

University of Maryland College Park September 2013 - May 2017
BS Electrical Engineering

TECHNICAL SKILLS

Software	Python, C++, C, MATLAB, Bash, Mathematica, Julia, Elisp, LaTeX
Electrical	Embedded system prototyping/debugging.
Mechanical	Prototyping (Manual and CNC machining, 3D printing, soldering/crimping etc.)

WORK HISTORY

University of California Santa Barbara September 2017 - Present
Graduate Student Researcher

- Researching the application of reinforcement learning to robotic control (**Python, C++, Matlab**). Focusing on the control of under-actuated dynamic systems and legged locomotion in particular.

Veoneer June 2019 - February 2020
Robotics Consultant

- Delivered a **C++** device driver and **ROS** node for a new automotive camera system designed for Daimler.
- Implemented camera authentication and security on a low power embedded system (**C**).

Northrop Grumman June 2016 - September 2016
Electrical Engineer

- System level integration for prototype sensor payloads in an unmanned underwater vehicle (UUV).

Naval Air Systems Command (NAVAIR) June 2015 - September 2015
Electrical Engineering Intern

- Developed a prototype vision system capable of imaging in extremely turbid underwater environments.
- Designed and constructed an underwater vessel to house and control the visioning system.

University Of Maryland September 2015 - June 2016
Undergraduate Student Researcher

- Implemented computer simulation of nematic liquid crystals using **Matlab** and **Mathematica**.
- Gave a talk at the American Physics Society March Meeting.

Horn Point Laboratory June 2014 - June 2015
Software Engineer

- Wrote software (**C++**) for a Remus 600 UUV to provide altitude control, user-defined acoustic modem messages, augmented data simulation, and adaptive mission planning to the vehicle.

PERSONAL PROJECTS

Seagul: Utility Library for Reinforcement Learning

- Wrote a **Python** package implementing state-of-the art reinforcement learning algorithms. Now used internally at the UCSB Robotics Lab for research in robotic control.

Qubo: Underwater Octocopter

- Led a team of around 8 engineers to design and build an autonomous underwater octocoptor from scratch. The vehicle can autonomously navigate to targets using computer vision. Semifinalists at Robosub 2017.
- Wrote majority of the vision (**OpenCV**), control (**C++**), autonomy (**Python**), and embedded (**Arduino**) software, using **ROS** as a middleware.

Aq Bars: Tactile, Fist Bumping, Robot Arm

- Wrote software connecting a Novint Falcon controller to a low-cost robot arm, allowing users to control the arm and "feel" objects it interacts with.
- Wrote Arduino code for the arm to allow for interactive use.

GAN Art

- Trained a Generative Adversarial Network (GAN) to make fine art using **Pytorch**.
- Created an interactive notebook allowing anyone to explore the trained model, interpolate between images, and more!

Compressed Air Engine

- Manufactured a small compressed air engine, using manual and CNC Machine tools.

PUBLICATIONS

Sean Gillen, Asutay Ozmen, and Katie Byl. Direct random search for fine tuning of deep reinforcement learning policies, 2021 (Preprint, under review)

Sean Gillen and Katie Byl. Mesh based analysis of low fractal dimension reinforcement learning policies. *International Conference on Robotics and Automation*, 2021

Sean Gillen and Katie Byl. Explicitly encouraging low fractional dimensional trajectories via reinforcement learning. *4th Conference of Robotic Learning*, 2020

Sean Gillen, Marco Molnar, and Katie Byl. Combining deep reinforcement learning and local control for the acrobot swing-up and balance task. *59th IEEE Conference on Decision and Control*, 2020

TEACHING

Intermediate C programming (Spring & Fall 2016)
Introduction to Circuits (Fall 2017)
Digital Control (Winter 2017)
Introduction to Probability & Statistics (Spring 2017)
Robotic Modeling & Control (Fall 2018)
Operating Systems (Spring 2019)
Compilers (Fall 2020)
Algorithms & Data Structures (Winter 2021, Spring 2021)