Ethan Senatore

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Education

University of Pennsylvania — Expected May 2026
M.S.E Robotics
Focus: Deep Learning, Perception and SLAM for Mobile Robotics
GPA: 3.83 — *Philadelphia, Pennsylvania*

Franklin and Marshall College — May 2024
B.A. Computational Physics and Applied Mathematics minor
Lancaster, Pennsylvania

Specialized Skills

Programming: Python (PyTorch, SciKit-learn, OpenCV), MATLAB, R
Machine Learning: Reinforcement Learning (PPO, Behavior Cloning, Actor-Critic, Q-Learning), NeRF, Computer Vision (YOLO, SOLO, Diffusion, Transformer)
State Estimation and Filtering: SLAM, EKF, UKF, Particle Filter, Hidden Markov Models (HMMs)
Simulation and Control: MuJoCo, F1TENTH, ROS2, OpenAI Gym, DM-Control
Other: Linux, Git, TensorBoard, Docker

Experience

Localization and Remote Sensing Intern — June 2025 – August 2025
Nokia Bell Labs — *Murray Hill, New Jersey*

- Developed an IMU-based localization pipeline utilizing the RoNIN (Robust Neural Inertial Navigation) neural architecture
- Collaborated on the development of a trajectory correction algorithm inspired by closest point optimization, significantly improving tracking precision and robustness
- Conducted comprehensive data collection for human tracking, facilitating the evaluation of pedestrian tracking performance in complex industrial environments
- Optimized and repurposed the existing codebase to improve data processing efficiency, inference speed, and overall presentation quality

Optical Engineering Intern — June 2023 – August 2023
Anduril Industries — *Lexington, Massachusetts*

- Designed an optical hardware setup for investigating infrared lens transmission through comprehensive lens testing using a mid-infared laser and off-the-shelf optomechanical products
- Developed an automated testing program featuring a GUI and multithreading capability to optimize testing processes and enhance data capture efficiency
- Aligned Off-Axis Parabolic mirrors using an interferometer, improving the sharp focus and accuracy of infrared cameras
- Automated an MTF testing setup using Newton Optics optomechanical equipment increasing characterization efficiency of infrared lenses
- Gained on hand experience and knowledge of object detection using computer vision and machine learning

Projects

PPO for Walker in DeepMind Control Suite: This project builds a PPO agent from scratch in PyTorch to control a DeepMind Control Suite walker. The goal was to achieve stable locomotion while closely following PPO's theoretical formulation.

Soccer IQ-Function: Framework for evaluating soccer actions via offline Q-function estimation using StatsBomb tracking data. Demonstrated that TD(0) estimators outperform Monte Carlo in predicting long-term returns.

'Beat The Expert' IL-RL Racing: Developed an autonomous F1TENTH racing framework combining PPO with a pre-trained HG-DAGGER policy, improving sample efficiency and benchmarking IL, RL, and expert methods.

Relevant Coursework

Machine Learning: Principles of Deep Learning, Learning in Robotics, Reinforcement Learning in Robotics
Perception & Vision: Advanced Machine Perception, Machine Perception
Control & Dynamics: Advanced Robotics

Other Interests

Athletics: Captain, Franklin & Marshall Men's Varsity Soccer (2023)
Leadership & Honors: Founder & President, Chess Club (2021–2023); Harwood Leadership Seminar Graduate (2022); Howard & Mary Patton Geophysics Award (2022)