

# Ryan Barry

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## Technical Skills

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**Languages:** Assembly, C/C++, MATLAB, PLC Ladder Logic, Python

**Frameworks:** CUDA, Git, Jupyter, Keras, NumPy, OpenCV, Pandas, PyTorch, ROS, Scikit-Learn, TensorFlow

**Software:** Altium Designer, AutoCAD, Creo, Inventor, LTSpice, MATLAB, SOLIDWORKS

**Hardware:** Microcontrollers, Motor/Sensor Control, PCB Design, SMT Soldering, TH Soldering, 3D Printing

## Professional Experience and Research

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**Robotics Research Engineer II**, *Robotics and Automation Design Lab*, Bryan, TX

March 2025 – Present

- Engineering fault tolerant robotic manipulators for use in contracted space missions, designed for environmental robustness and modularity.
- Designed custom PCBs in Altium for testing and spaceflight applications.
- Developed firmware and software in ROS, C++, and Python for actuator control and status monitoring.
- Built real-time data acquisition tools in C++ and Python for diagnostic logging, fault response validation, and performance analysis.

**Researcher**, *RIT Adaptive Human-Robot Teaming Lab*, Rochester, NY

August 2023 – May 2024

- Developed a custom reinforcement learning (RL) environment in ROS and Gazebo for terrain-aware velocity control of a quadruped robot in a physics-based simulator.
- Implemented Proximal Policy Optimization (PPO) from scratch in PyTorch with LSTM-based policy and value networks; built a custom trajectory buffer and integrated the full RL pipeline into the ROS-based system.

**Robotics Graduate Teaching Assistant**, *Rochester Institute of Technology*, Rochester, NY

August 2023 – May 2024

- Facilitated student learning of high-level robotics concepts and ROS through lab work and research projects.

**Software Technical Lead**, *RIT University Rover Challenge Team*, Rochester, NY

June 2023 – May 2024

- Spearheaded software architecture development for autonomous and remote operation of a robotic rover.
- Directed a team of engineers to develop and test software for all subsystems of RIT's rover.
- Integrated a Python-based ROS application with embedded C++ code for peripheral control via CAN.

**Electrical Engineer**, *RIT Electric Vehicle Team*, Rochester, NY

August 2021 – May 2024

- Designed a CAN interface board for a BeagleBone Black to communicate with the network of custom electric motorcycles.
- Led a team of undergraduate electrical engineers to develop a CAN based IMU board in Altium.
- Derived and documented a full gate driver and control architecture for a 3-phase BLDC motor from first principles; mentored junior team members in implementing the full motor controller in Altium for a brushless coolant pump as a foundation for future high-power traction systems.

**Machine Learning R&D Intern**, *Penn State ARL*, University Park, PA

May 2023 – August 2023

- Developed proof of concept synthetic data pipeline for active acoustic ML in unmanned undersea vehicles.
- Designed Python application for scenario development and interface with UUV simulation software.
- Developed an acoustic range and angle of arrival regression model to support transfer learning hypothesis.

**Product Engineering Co-op**, *The Raymond Corporation*, Greene, NY

January 2022 – July 2022

**Electrical Engineering Intern**, *Davis Standard LLC*, Fulton, NY

May 2021 – August 2021

## Projects

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**Open-Source Universal Kinematic Libraries for Generic Robots**

September 2023 – Present

- Developed Python and C++ libraries for forward/inverse kinematics of generic arm and fixed-wheeled mobile robots.

**Multi-Agent Reinforcement Learning for Pacman Capture the Flag**

November 2023 – December 2023

- Q-Learning agents with shared memory and reward shaping; reached tournament finals.

**Air Hockey Robot**

October 2023 – December 2023

- Designed a 3-DOF air hockey robot with custom YOLOv8 puck detection and LSTM-based trajectory prediction.

**Full-Stack Robot for Real-Time Object Interception**

February 2023 – April 2023

- Designed and built a custom omnidirectional robot—including CAD, 3D-printed omniwheels, electronics, and ROS.
- Implemented object detection and 3D velocity estimation for real-time trajectory matching of a free-floating balloon.

**Underwater Robot Motherboard PCB**

November 2022 – April 2023

- Integrated a 7-sensor perception suite with power distribution and propulsion control on a custom PCB.

**Collaborative Robot Ball-and-Cup Game**

February 2023 – April 2023

- Developed a ROS-based interactive game for Baxter robot using YOLOv6 and DeepSORT for object tracking.

**Nerf Mobile Robot with Autonomous Targeting**

November 2021 – December 2021

- Built a mobile robot with autonomous tracking and firing at a moving shield using a modified Nerf blaster.

## Education

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**Rochester Institute of Technology**, Rochester, NY

Master of Science in Electrical Engineering

Cumulative GPA: 3.92

*Specialization in Robotics and AI/ML*

**Rochester Institute of Technology**, Rochester, NY

Bachelor of Science in Electrical Engineering, *Summa Cum Laude*

Cumulative GPA: 3.86