Ryan Barry

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Technical Skills

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

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 PCBs for custom electric motorcycles including road superbikes and a dirt bike.
- Designed a CAN interface board for a BeagleBone Black to communicate with the bike's network.
- 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.
- Designed an opto-isolated MOSFET switching array and CAN-based control system for a brushless coolant pump; mentored junior team members in implementing the full motor controller in Altium 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*
- Programmed PLC-based test fixture with touchscreen UI for reliability testing of forklift control cables.
- Supported CAN system emulation for motor controller validation.

Electrical Engineering Intern, *Davis Standard LLC*, Fulton, NY *May 2021 – August 2021*
- Revised schematics and drawings in AutoCAD; developed early prototype for 3D printer-inspired polymer extruder.

Projects

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.

Air Hockey Robot *October 2023 – December 2023*
- Designed a 3-DOF air hockey robot using YOLOv8 for puck detection and LSTM-based trajectory prediction.

Trajectory Matching Omnidirectional Mobile Robot *February 2023 – April 2023*
- Designed and programmed a holonomic robot with real-time YOLOv8-based object tracking and trajectory alignment.

Underwater Robot Motherboard PCB *November 2022 – April 2023*
- Designed and soldered a PCB to integrate power distribution, propulsion and rudder actuation, and 7 onboard sensors.

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.

Autonomous Nerf Blaster Mobile Robot *November 2021 – December 2021*
- Created a mobile robot with a modified Nerf blaster to autonomously track and fire at a moving shield.

Education

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