Ryan Barry

ryanbarry.engineering@gmail.com | (315) 596-0754 | linkedin.com/in/ryanbarry99 | github.com/ryan-barry-99

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

Researcher, *RIT Adaptive Human-Robot Teaming Lab*, Rochester, NY   *August 2023 – May 2024 (planned to resume)*
- Conducting research on applying Proximal Policy Optimization to quadrupedal robot navigation using 2D/3D camera data and 360° LIDAR.
- Integrated the PPO algorithm for real-time control, ongoing plans to refine the policy's convergence and performance.

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 computer scientists 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 Controller Area Network (CAN).

Electrical Engineer, *RIT Electric Vehicle Team*, Rochester, NY   *August 2021 – May 2024*
- Designed PCBs for custom electric motorcycles (IMU, CAN data handler, and 3 phase motor controller).
- Led teams and mentored underclassmen in PCB design using Altium, and in research and development principles.

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 a PLC based robotic test fixture with a touch LCD to stress test forklift control handle cables.
- Researched and documented the adaptation of a software application to emulate CAN functionality for motor controllers on PCBs used in forklift test fixtures.

Electrical Engineering Intern, *Davis Standard LLC*, Fulton, NY   *May 2021 – August 2021*
- Revised wiring schematic and electrical panel drawings in AutoCAD.
- Researched and developed proof of concept prototype for an industrial polymer extruder modeled after 3D Printers to be used for automated splice line placement along material necking border.

Projects

Custom Hybrid Electric Wheelchair Attachment   *September 2024 – Present*
- Designing a non-invasive hub actuation system for low drag, hybrid manual and powered control of manual wheelchairs.

Open-Source Universal Kinematic Libraries for Generic Robots   *September 2023 – Present*
- Developed Python and C++ libraries for forward and inverse kinematic calculations of any fixed-wheeled mobile robot.
- Developed Python and C++ libraries for forward and inverse kinematic calculations of any arm robot configuration.

Air Hockey Robot   *October 2023 – December 2023*
- Designed 3 DOF robot to play air hockey via YOLOv8 object detection and LSTM trajectory prediction.

Trajectory Matching Omnidirectional Mobile Robot   *February 2023 – April 2023*
- Designed and programmed an omnidirectional robot to serve as a modular research platform.
- Explored detection and tracking in mobile robotics, utilizing YOLOv8 to follow a free-floating balloon.

Underwater Robot Control System   *November 2022 – April 2023*
- Designed and manufactured a motherboard PCB capable of managing power distribution, motor control, servo control, interfacing with two cameras, and integrating five sensors.

Collaborative Robot Interactive Game   *February 2023 – April 2023*
- Developed a ROS based interactive ball and cup game for Baxter robot with DeepSORT and YOLOv6.

Autonomous Nerf Blaster Mobile Robot   *November 2021 – December 2021*
- Designed an autonomous mobile robot with a modified Nerf blaster to track and shoot 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
Applicable Courses: Robotic-Systems, Principles-of-Robotics, Advanced-Robotics, Intro-to-Artificial-Intelligence, AI-Explorations, Biorobotics/Machine-Learning, Deep-Learning, Robot-Perception