

FERBIN RICHARD

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SUMMARY

Robotics MS (Northeastern, April 2027) who builds simulation rigs on real autopilot firmware and takes the same code to hardware: led the co-op team on an eight-thruster ROV from bench bring-up to open water, and took 2nd place, Robotics track, Hackachusetts 2026.

EDUCATION

Northeastern University, Boston, MA

Sep 2025 - April 2027

Master of Science in Robotics

Vellore Institute of Technology, Chennai, India

Sep 2021 - April 2025

Bachelor of Technology in Mechatronics, Robotics and Automation Engineering

TECHNICAL SKILLS

Robotics: ROS 2 (Nav2, tf2, rosbag2, ros2_control), MAVLink and ArduPilot/ArduSub/PX4, SLAM (RTAB-Map, SLAM Toolbox), sensor fusion, motion planning, inverse kinematics

Simulation & Learning: NVIDIA Isaac Sim, Isaac Lab, MuJoCo, Gazebo Harmonic, ArduPilot SITL, PPO reinforcement learning, PyTorch, YOLO, OpenCV

Hardware & Tools: Pixhawk, Jetson Orin Nano, Raspberry Pi 5, ESP32-S3, Ping360 sonar, RealSense D455, VectorNav IMU, I2C and serial bring-up, Docker, Linux, Git

Programming Languages: Python, C++, Embedded C, Bash, CMake

PROFESSIONAL EXPERIENCE

Robotics Engineer (Co-op), Archenaux Robotics, Boston, MA

June 2026 - September 2026

- Primary engineer for the vehicle's sensor stack and operator interface: Ping360 scanning sonar, three cameras, VectorNav VN-100 IMU, Bar30 depth, lighting and the PyQt operator UI. Diagnosed a sonar driver returning a fake wall at 0.3 m on every beam while the real wall sat at 4 to 5 m, invisible downstream because message rates looked valid, and fixed it with a regression test; raised the serial link to 2 Mbaud, taking a 360-degree sweep from 23.3 s to 5.9 s; and characterized the IMU the estimate depends on over 321k samples (Allan variance, Kalibr noise parameters, gyro ARW 0.26 deg/sqrt-hr).
- Sole author of the containerized runtime that ships to the real ROV: MAVLink bridge on the companion computer, joystick piloting, mechanism control, and video, as one multi-arch Docker image deployable on a blank laptop with a single script.
- Trained an underwater object detector with no real training data by generating a seeded procedural world that emits ground-truth labels via 3D-to-2D projection, reaching 0.969 mAP@50 across two diagnosed fine-tuning rounds and cutting clutter false positives from 54% to 0% (YOLO11, PyTorch).
- Brought up the vehicle's sensors, fixing a dead depth sensor traced to a BARO_PROBE_EXT I2C bitmask, an RC-override system-ID mismatch blocking all thruster commands, and tether rail sag misread as thermal throttling; authored the power-tree analysis behind the companion-computer swap.
- Owned the shared three-container simulation core (ArduSub SITL, Gazebo Harmonic, QGroundControl) the other engineers build on, and ported the vehicle to NVIDIA Isaac Sim as a second physics backend with a Gerstner-wave ocean and hydrodynamics, leading the co-op engineering team reporting to the CEO across five repositories.

Vice-President (Robotics Team), Vellore Institute of Technology, India

Oct 2022 - Aug 2024

- Co-led a team of 80 to design and manufacture FPV drones, autonomous drones, battle bots, and AMRs.
- Organized workshops and competitions to build robotics talent, mentoring students in ROS2, Gazebo, and OpenCV, and developed algorithms for path planning, navigation, and sensor fusion.

Robotics Intern, Mafkin Robotics, Chennai, India

Jan 2024 - June 2024

- Engineered an autonomous ship hull cleaning robot to address biofouling, which increases drag by up to 40% and drives higher fuel costs and carbon emissions.
- Implemented real-time 3D SLAM in Gazebo using RTAB-Map, enabling precise mapping and navigation for underwater environments, and collaborated on a cavitation jet based cleaning system.

Research Intern, Universiti Teknologi Petronas, Perak, Malaysia

Sep 2023 - Dec 2023

- Researched autonomous drone and AMR technologies for surveillance and navigation, applying ROS2 for system integration and control.
- Implemented and tested SLAM and navigation algorithms in Gazebo, and integrated multi-sensor perception using Intel RealSense D455i depth cameras, RPLIDAR, wheel encoders, and IMUs.

PROJECTS

Bridge Inspection Drone and ROV, Hackachusetts 2026, 2nd place, Robotics track

Oct 2026

- On a 3-person team, built the robots, an Isaac Sim rebuild of a Boston bridge and the autopilot loop in one day: real ArduCopter and ArduSub SITL flying a drone and a DVL-navigated ROV over MAVLink, with GPS degraded under the deck. The ROV held 0.60 m worst-case navigation error over a 200 m dive with GPS off, the two robots built one 4.54M-point lidar and sonar model, and a 21-topic ROS 2 bag (35,752 messages) drove the live finals demo from one Docker launch.

Hyperion: Warehouse Robot Fleet Ops Agents, Dell x NVIDIA GB10 hackathon

Oct 2026

- On a 4-person team, built the Isaac Sim warehouse of 20 Nova Carter robots streaming live fleet telemetry and deployed the stack as six services in one Docker image on the GB10, where a local LLM triages robot faults into tickets; a follow-up agent pipeline (fault detection, root cause, technician scheduling, Hungarian re-allocation) raised simulated deliveries from 27.3 to 42.0 (+54%) over 3 seeds, with replay verification of every run.

Isaac Lab Reinforcement Learning, github.com/FERBIN12

2026

- Brought a quadruped Isaac Lab does not ship (Barkour vB) into the GPU RL pipeline through URDF conversion, actuator and articulation config and a PPO environment, and ran a 29-run reward-term ablation on a Unitree G1 humanoid where removing the termination penalty cut episode length to 4.2% of baseline while reward climbed; exported policies to ONNX with sim-to-sim parity checks and ran them with no simulator, on a 6 GB laptop GPU.

AWARDS

- 2nd place, Robotics track, Hackachusetts 2026,** drone and ROV bridge inspection on real ArduPilot firmware in Isaac Sim.
- Won Track 2, The Open Accelerator healthcare hackathon,** hosted by Red Hat with IBM Ventures and the Mass AI Hub.

Oct 2026
2026

PUBLICATIONS

- Automated Detection and Classification of Rice Leaf Diseases Using YOLOv8, **IET**
- Efficient Real-Time Okra Stage Identification Using YOLOv8, **IEEE**

Jan 2025
Sep 2024