Field Robotics Summer Research Internship

University of Toronto
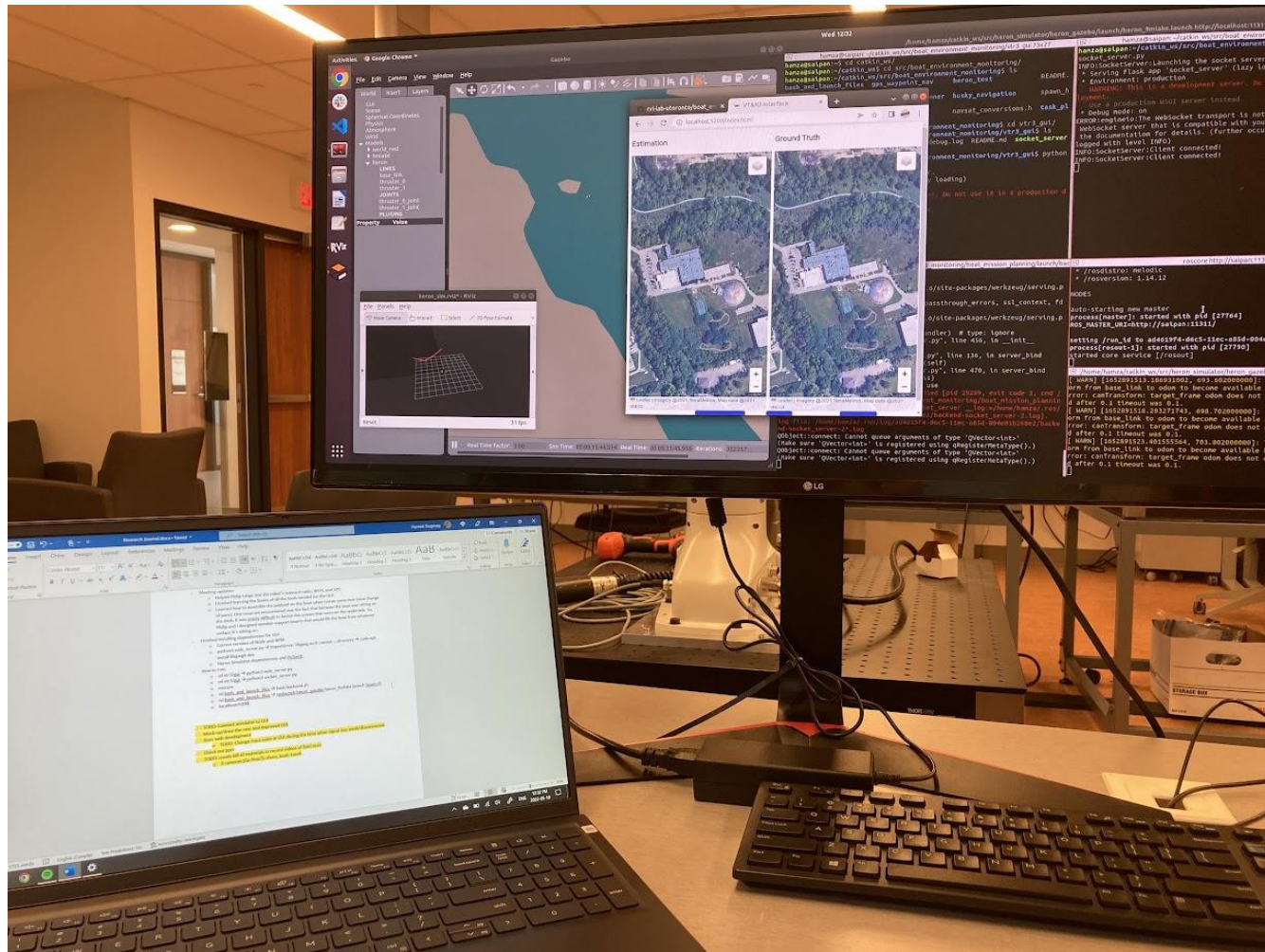
Autonomous Space Robotics Laboratory (ASRL)

Robot Vision and Learning Lab (RVL)

GPS, Stereo Camera, Policy Execution Testing
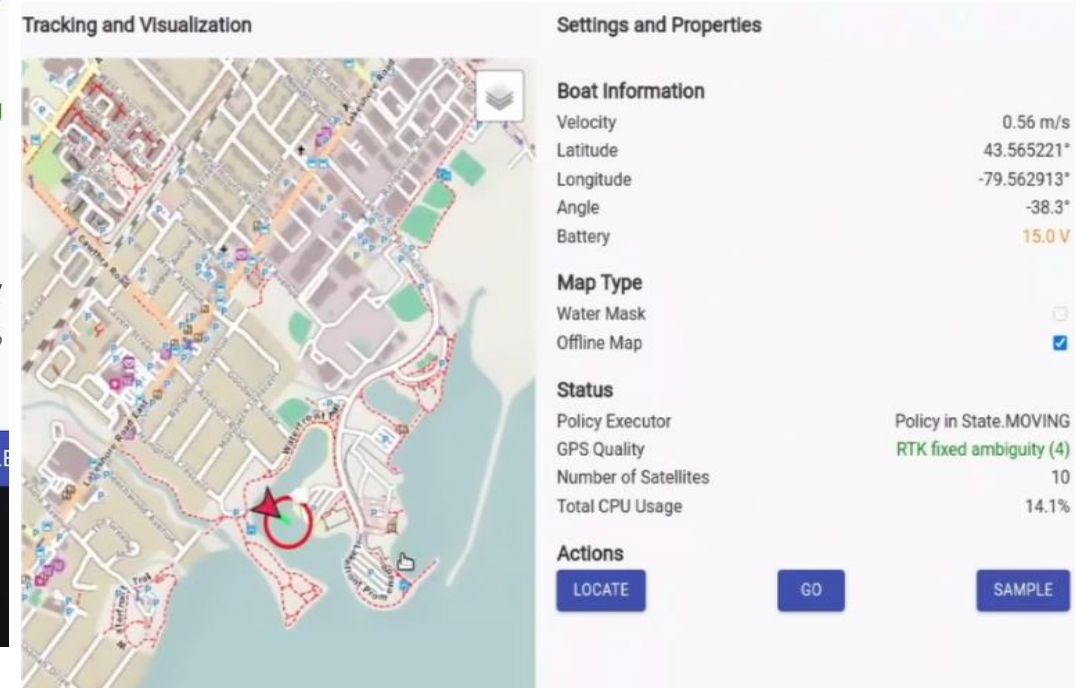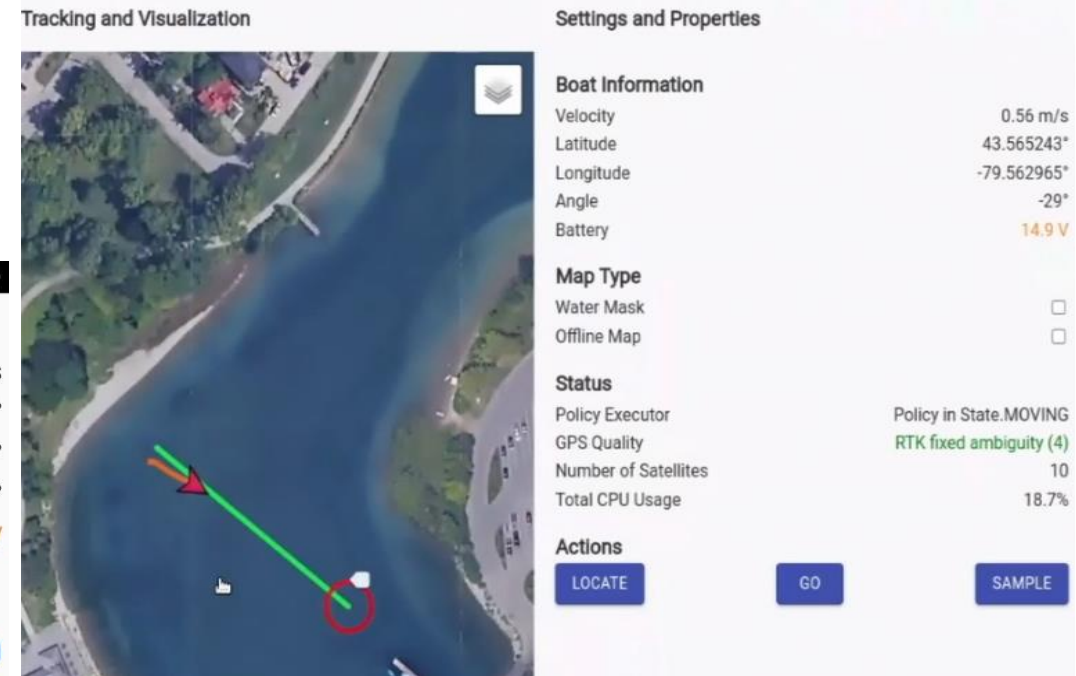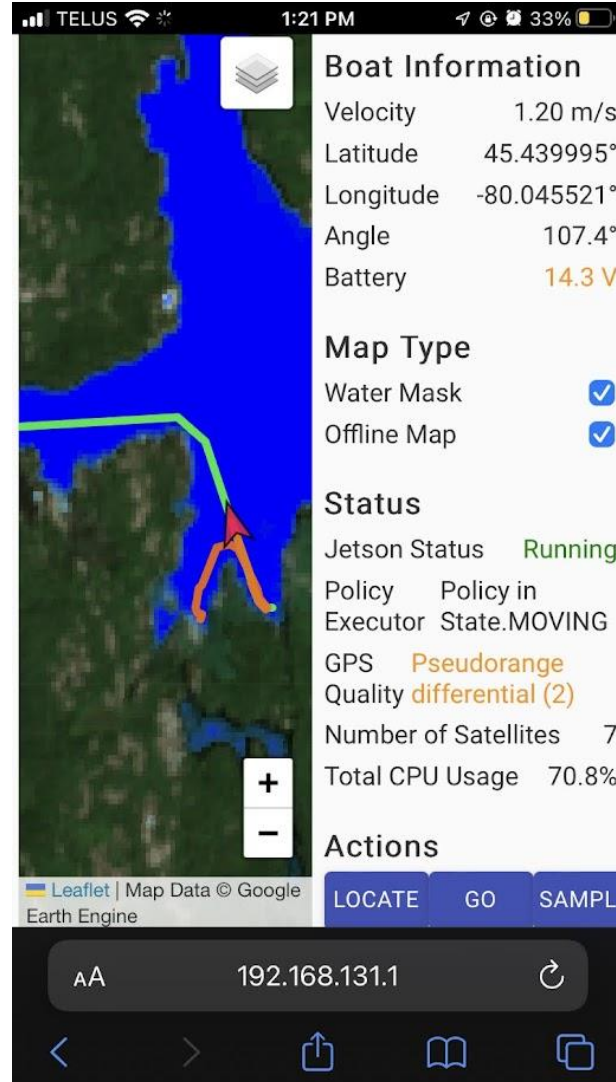
Lab Setup

Robot-Tracker GUI

Splicing, Soldering, Heat-Shrinking, and Connecting Various Connectors
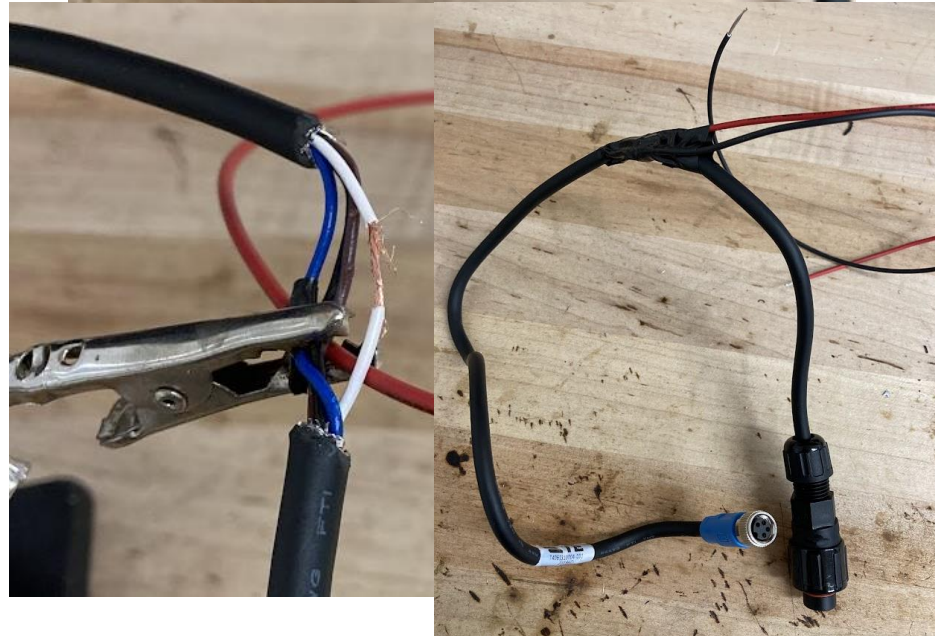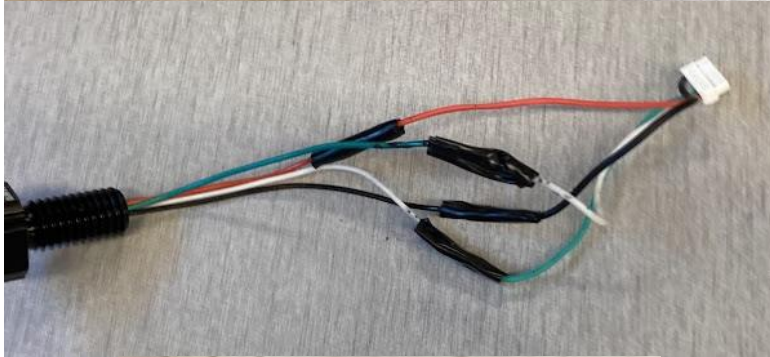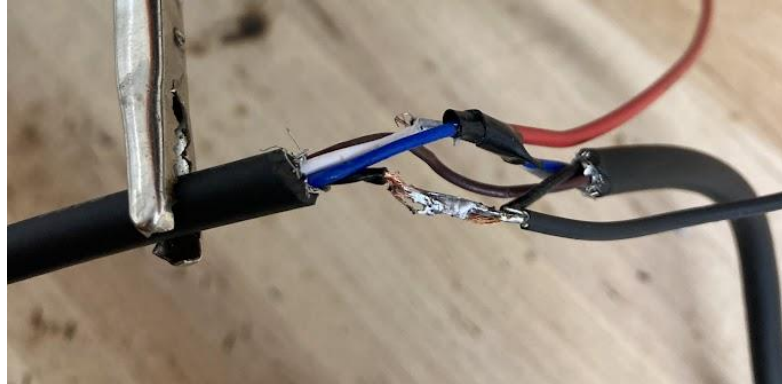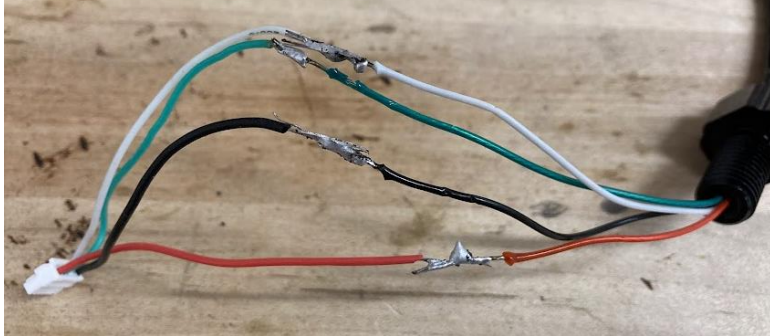
Navigation Algorithms Simulation Pipeline

Field Test #1: RK McMillan Park

Field Tests #2-3: 120 Lakefront Promenade

Lakefront Test Plan

Arrive at 120 Lakefront Promenade by 12pm, aim to finish by 5pm

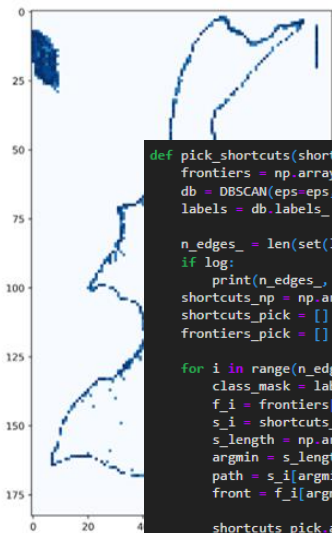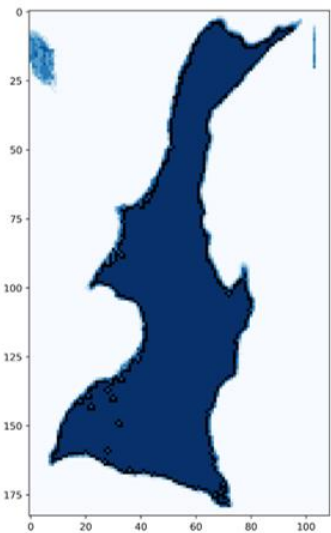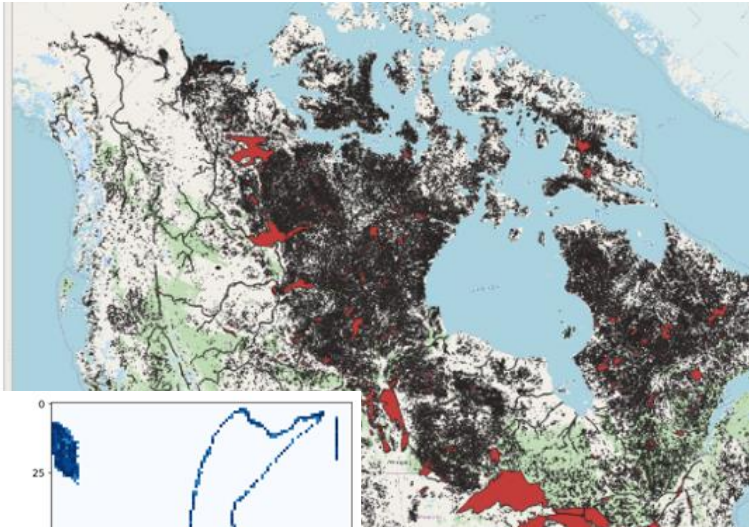| Tests	Control	Time	Result
Preparation (unload tools, boat, kayak), setup laptop		0.5hr	
Remote control Heron near shore, return back, and dock	RC	0.5hr	
Test if we can remote control heron to stop, back, and rotate in-place	RC	0.5hr	
Test if I can tow Heron on a Kayak back to dock	Tow	0.5hr	
Test the IMU orientation in ROS	Tow	0.5hr	
Test the GPS & localization node by towing the boat in a loop	Tow	0.5hr	
Test the velocity controller performance with manual twist command in rqt	Vel Ctrl	0.5hr	
Test if the local planner can drive blindly to a GPS pose	Local Planner	0.5hr	
Visualize sonar readings with Ping Viewer	RC	0.5hr	
Identify sonar frame orientation in ROS	ROS	0.5hr	
(if time left) Collect Zed Camera data	RC/Tow	0.5hr	
(if time left) Test water sampling	ROS	0.5hr	

Field Test #4: UTM RAWC Swimming Pool
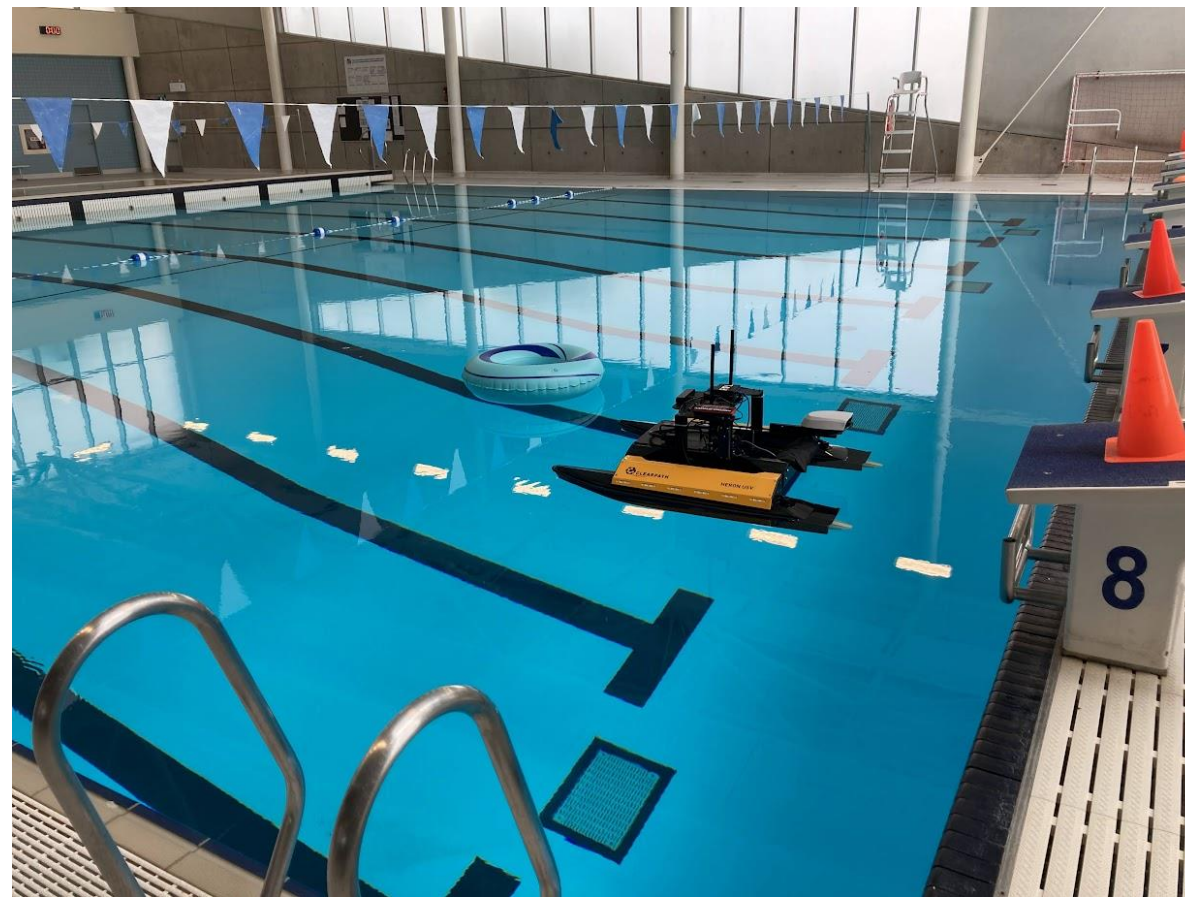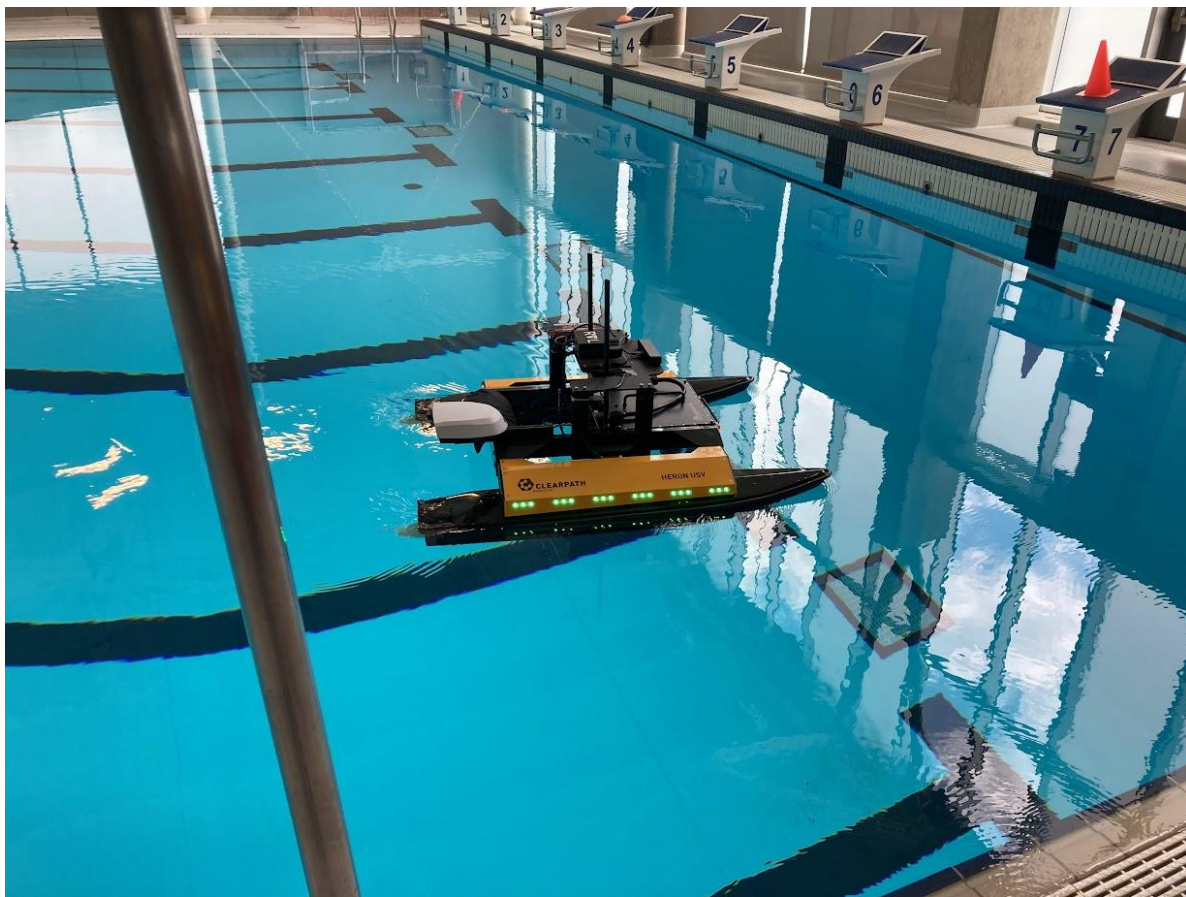
Field Tests #5+: Nine Mile Lake (Day 1)

Field Tests #5+: Nine Mile Lake (Day 2)

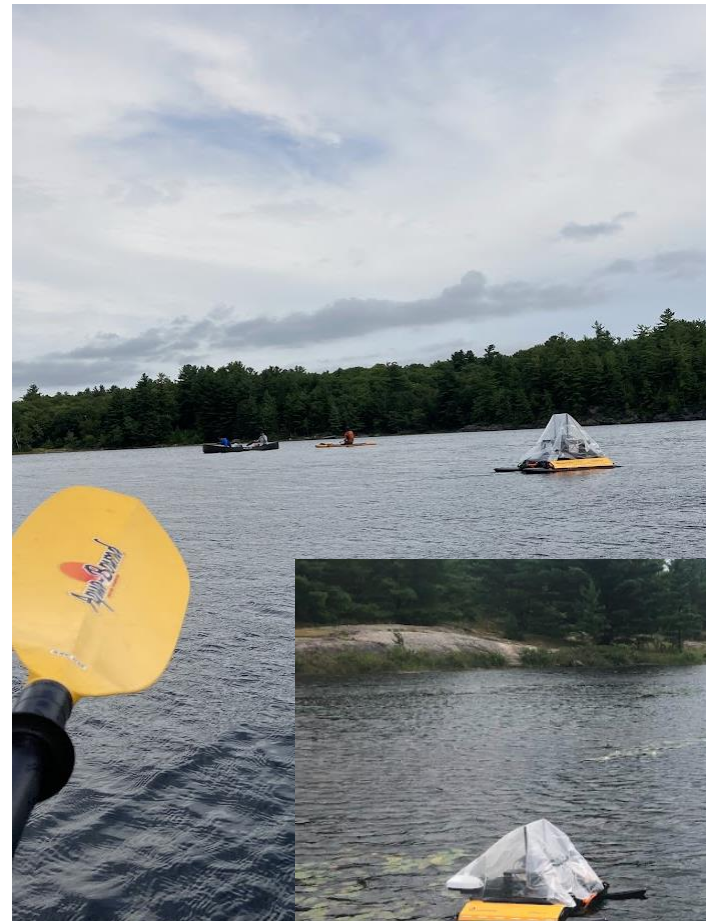Test - Full navigation policy (4 samples, 3 stochastic edges)

7:20 - Pre-launch verification
- ☐ XP-1 battery level
- ☐ All ethernets cable securely connected and lights flashing
- ☐ No exposed / wet electronics
- ☐ base-station communication
- ☐ remote controller works
- ☐ localization (GPS, IMU)
- ☐ sensors (stereo, sonar)
- ☐ local planner (occupancy grid)
- ☐ visualization (rviz, GUI, rqt)

7:25 - Pre-launch configuration
- ☐ Set policy and experiment name

Field Tests #5+: Nine Mile Lake (Day 3)