Will Heitman

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Making robots that help people and the planet.
Master's student at CMU Robotics Institute.

Education

M.S. in Robotic Systems Development, Carnegie Mellon – Aug. '23 – May '25 (expected)

Relevant courses taken and in progress:

Manipulation, Estimation and Control	*Computer Vision*	*Robot Autonomy*
Systems Engineering and Management for Robotics	*Intro to Robot Learning*	
Capstone Project I *Robot Mobility on Air, Land, & Sea*	*Introduction to Robotics Business*	

B.S. in Computer Engineering, University of Texas at Dallas (with honors) – Sept. '19 – May '23

• Finalist for Outstanding Undergraduate Student Award (out of 21,500 students)

• National Merit Scholarship Program within Hobson Wildenthal Honors College

Skills

Languages: français (B2 as of summer '22), C++, Python, Typescript, etc. **Tools:** ROS, Docker, CARLA, Unity, Colcon, MATLAB, Fusion 360. **Concepts:** SLAM, computer vision, ML, reinforcement learning, firmware, electrical design, mechanical & electronic fabrication, UX design, full-stack web development.

Projects

Automated reforestation using a ground robot, 2023 – '25 (expected).
Developing a complete robotic system to reforest marginal pastureland conveniently and inexpensively.

- Part of a team of five CMU Robotics students.
- Developing a custom, photorealistic forest simulator with Unity.
- Working with Pennsylvania foresters to publicly deploy on pastureland.
- Using off-the-shelf bare-root saplings.

***Nova* autonomous driving group**, *founder and team lead,* 2019 – '23.
Built custom AV hardware and software. Drove our car autonomously on 6+ km of public roads.

- Led ~20 student researchers with custom training, documentation, and mentorship.
- Worked with local governments and non-profits to advance real-world AV deployments.
- Architected and delivered a highly complex, safety-critical software/firmware/hardware system.
- Designed custom path planner derived from RRT, along with coupled actuator PIDs.
- Developed and leveraged custom simulation workflows using CARLA.
- Wrote a full-stack, real-time web dashboard using websockets, Three.js, rosbridge, and Tailwind.

NSF REU on point matching optimization, Ruths Lab at UTD, summer 2021.
Implemented, tested, and deployed point matching state estimation algorithms, including ICP, NDT, and GICP, along with factor graph-based LIO-SAM, onto a real vehicle.

Simulation of efficient SLAM using constrained zonotopes, Ruths Lab, 2022 – '23
Applied constrained zonotopes to express SLAM as a linear optimization, which is more efficient than factor graph-based optimization while offering comparable accuracy in simulation.

President, **UT Dallas Environmental Conservation Organization**, 2020 – '21
Organized volunteer activities, hosted talks by prominent authors and scientists, advised campus policymakers.