Micah Nye

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Education

Carnegie Mellon University Robotics Institute May 2026
M.S. in Robotics (Advisors: Sebastian Scherer & Wenshan Wang) Cumulative GPA: 4.0/4.0

University of Pittsburgh Swanson School of Engineering August 2024
B.S. in Mechanical Engineering (Dean's Honors List) Cumulative GPA: 3.96/4.00

Skills

Specialized Topics: Robot Learning, Optimal Control, Motion Planning, Field Testing, Systems Integration, Dataset Balancing
Languages: Python, C++, Embedded C, MATLAB, HTML, Javascript
Frameworks/Development: PyTorch, ROS2/ROS, Docker, DDS, TensorFlow, OpenCV, GTSAM
Software: Microchip Studio, Raspberry Pi, Arduino, IsaacSim, Unreal Engine, Adobe Premier Pro, Solidworks, Fusion 360, LT Spice
Fabrication: 3D Printing, Soldering, CNC Laser Cutting, Waterjet Cutting, Lathe
Relevant Coursework: 16-831 Intro to Robot Learning, 16-745 Optimal Control and Reinforcement Learning, 16-782 Planning and Decision Making, 16-711 Kinematics, Dynamics, & Controls, 16-720 Computer Vision, Intro to Machine Learning, 16-811 Mathematic Fundamentals for Robotics

Research Experience

The AirLab at Carnegie Mellon University (🔗) **08/2024–Present**
Graduate Research Student—Advisors: Sebastian Scherer, Wenshan Wang *Pittsburgh, PA*

- Developed predictive dynamics models for off-road driving using robot learning techniques
- Collaborated with Army Research Laboratory on self-supervised autonomy research, leading to successful field-testing and deployment on sponsor robot platforms
- Deployed full autonomy stack on quadruped robot for navigation in unstructured environments, part of DARPA Triage Challenge
- Optimized large data transport by implementing RTI Connext DDS protocol and building specialized Docker infrastructure for reliable, high-throughput communication
- Developed and maintained large ROS2 workspace (39 packages, 24 submodules), introducing better code maintenance and source control practices to the research group

The AirLab at Carnegie Mellon University (🔗) **09/2022–08/2024**
Research Assistant—Advisors: Sebastian Scherer, Wenshan Wang *Pittsburgh, PA*
Paper

- Worked on a full-scale autonomous ATV with online learning and navigation in rugged, uncertain terrain
- Established effective ways to estimate epistemic model uncertainty of traversability costmap predictions over patches of ground in unknown off-road terrain
- Implemented deep learning models in PyTorch and TensorFlow frameworks for uncertainty estimation
- Designed a computer box for an off-road ATV robot, equipped with vibrational dampening, modularity, and environmental protection

Indy Autonomous Challenge with MIT-PITT-RW (🔗) **03/2022–05/2025**
Chief Engineer, Localization and Deployment Subteam Lead *Pittsburgh, PA*
Paper

- Led a 40-member autonomous racing team as Chief Engineer (and 7-person localization/deployment subteam), delivering a full-scale autonomous racecar operating reliably at speeds up to 155 mph in multi-agent competitions

- Implemented IMU-centric SLAM to improve GPS-denied state estimation robustness, while implementing IMU fusion with an EKF to add failsafe dead-reckoning modes for degraded sensing.
- Built a unified ground-truth and track-artifact API and integrated it across perception, localization, planning, and control modules to improve system-level efficiency.
- Collaborated with researchers from multiple R1 institutions on a fully student-led, uncompensated project

ESTAT Actuation (Industry R&D) (🔗) **01/2023–12/2023**
Lead Software Developer & Mechanical Co-op—Advisors: Kirby Witte *Pittsburgh, PA*
Media

- Developed device test stands to research electrostatic robotic clutches, directly enabling company success
- Placed 1st out of 9 startups in Startup Challenge at 2023 International Automate Trade Show
- Developed a low-level motor controller with torque feedback and integrated new encoder, writing in embedded C and streaming measurements to a multithreaded python planner
- Established a robust, generalizable architecture for longevity, linear, and high-torque test stands with hardware
- Overhauled software source control with a focus in validation testing, documentation, and user-friendliness

Carnegie Mellon Robotics Institute Summer Scholar (RISS) (🔗) **06/2023–08/2023**
Summer Scholar — Advisors: Sebastian Scherer, Micah Corah *Pittsburgh, PA*
Paper | Poster | Video

- Worked on a collaborative team of quadrotors for creating a filming and reconstruction autonomy platform
- Developed a photorealistic, highly dynamic simulator using IsaacSim for quadrotor aerial simulation
- Implemented a non-linear minimum-snap-based controller for tracking aggressive trajectories
- Developed infrastructure for imperative learning safe-navigation planner to act as local planner for filming drones

Publications & Presentations

[C1] **BETTY Dataset: A Multi-modal Dataset for Full-Stack Autonomy**
IEEE International Conference on Robotics and Automation, 2025. **M. Nye**, A. Raji, A. Saba, E. Erlich, R. Exley, A. Goyal, A. Matros, R. Misra, M. Sivaprakasam, M. Bertogna, D. Ramanan, S. Scherer.
Paper | Website

[C2] **TartanDrive 2.0: More Modalities and Better Infrastructure to Further Self-Supervised Learning Research in Off-Road Driving Tasks**
IEEE International Conference on Robotics and Automation, 2024. M. Sivaprakasam, P. Maheshwari, M. G. Castro, S. Triest, **M. Nye**, S. Willits, A. Saba, W. Wang, S. Scherer.
Paper | Website | Video | Code

[C3] **A Quantitative Analysis of Undergraduate Researchers' Intent to Apply to Graduate School**
IEEE World Engineering Education Conference, 2026. R. Burcin, **M. Nye**, I. Adu, V. Mruthyunjaya, J. M. Dolan.

[J1] **Fast and Modular Autonomy Software for Autonomous Racing Vehicles**
Journal of Field Robotics Vol. 4, 2024 (now retitled as IEEE Transactions on Field Robotics) A. Saba, A. Adetunji, A. Johnson, A. Kothari, M. Sivaprakasam, J. Spisak, P. Bharatia, A. Chauhan, B. D. Jr., N. Gasparro, C. King, R. Larkin, B. Mao, **M. Nye**, A. Parashar, J. Attias, A. Balciumas, A. Brown, C. Chang, M. Gao, C. Heredia, A. Keats, J. Lavariega, W. M. III, A. Slavescu, N. Stathas, N. Suvarna, C. T. Zhang, S. Scherer, and D. Ramanan.
Paper

[J2] **Simulation and Control for Learning Collision-free Navigation for Aerial Vehicles**
Robotics Institute of Summer Scholars Working Papers Journal, Vol. 11, 2023. **M. Nye**, M. Corah, and S. Scherer.
Paper | Poster | Video

[W1] **TartanDrive 1.5: Improving Large Multimodal Robotics Dataset Collection and Distribution**
IEEE International Conference on Automation and Robotics Workshop on Pretraining for Robotics, 2023. M. Sivaprakasam, S. Triest, M. G. Castro, **M. Nye**, M. Maulimov, C. Ho, P. Maheshwari, W. Wang, and S. Scherer.
Paper

Fellowships & Awards

- CMU Rales Fellow (Inaugural Cohort) ($191k) (🔗) 04/2024 – 05/2026
- NSF Graduate Research Fellowship Honorable Mention (🔗) 04/2024
- NSF REU Scholar 08/2023
- CMU RISS Scholar ($8k) 08/2023
- Pitt Success Merit Grant ($8k) 08/2020–08/2024
- Pennsylvania Ready to Succeed Scholarship ($6.6k) 02/2023

Professional Service & Community

Professional Service

- Reviewer for IEEE RA-L 2025 (3 submissions)
- Reviewer for IEEE ICRA 2025 (1 submission)
- Organizer for RSS 2025 Workshop on Resilient Off-road Autonomous Robotics (🔗) 06/2025
- Organizer for undergraduate Intro to ROS Robotics Workshop (🔗) 03/2024
- CMU RISS REU Admissions Committee 01/2024

Leadership & Teaching

- Principal Investigator for Study on REU Impact 08/2025
- Researcher for Robotics Institute Demographics and Spatial Equity (🔗) 05/2024–01/2025
- Robotics Teacher at Summer Camp with United Way Venango County (🔗) 07/2024–08/2024
- Robotics Teacher with the Northside SAFE for the Summer Program (🔗) 06/2024–08/2024
- RISS Scholar Buddy 06/2024–08/2024
- Outreach Initiative Team Member for CMU RISS RISS Robolaunch (🔗) 08/2023–05/2024
- High school alumnus talk (self-initiated) 05/2024
- Student Leader at Community Engagement Center Robotics Week (🔗) 04/2024
- Certified Tutor for Calculus & Physics at University of Pittsburgh Study Labs 08/2021–05/2022
- Residence Hall Council 08/2020–05/2021

Memberships

- Institute for Electrical and Electronics Engineers
- Robotics and Automation Society
- American Society of Mechanical Engineers
- Society of Automotive Engineers
- American Society for Engineering Education