

Nathan Adkins

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Education

West Virginia University, Morgantown, WV Aug 2021 - May 2025
Bachelor of Science in Computer Engineering (ABET), Minor in Computer Science, Minor in Economics

Internships & Experience

WVU Interactive Robotics Laboratory, Morgantown, WV May 2023 - Aug 2023
NSF-Funded REU Researcher

- Integrated an autonomous navigation system utilizing a LiDAR, IMU, and SLAM algorithms.
- Gained experience with ZED stereo cameras, Intel RealSense depth cameras, and ROS2.
- Researched creating real-time human safety maps in retail spaces using an autonomous mobile robot.
- Developed a live safety data mapping tool for retail spaces using wheel odometry and semantic segmentation.

Research Intern May 2022 - Apr 2023

- Co-authored an IROS 2023 paper on swarm robotics and robotic morphogenesis.
- Studied emergent behavior in robotic swarms utilizing biologically inspired design.
- Programmed microcontrollers in C and Python to gather environmental data from I2C sensors.
- Developed a scalable software architecture for a unique robotic swarm system utilizing Python and ROS.

Projects

WVU University Rover Challenge Team, Morgantown, WV Aug 2023 - May 2025
Algorithms Lead

- Led a small team of programmers in developing a robot autonomy system capable of navigating a mock Mars environment, placing second in the 2024 international competition.
- Trained a custom YOLO model, enhancing its performance using the Albumentations library for data augmentation.
- Designed an autonomous navigation system with a PRM global planner and SLAM-based local planner.
- Built a React-based robot control interface including a map system, robot diagnostics, and live camera streams.

Programming Lead Aug 2022 - Jul 2023

- Led a team of 20+ programmers in designing and developing a robot capable of autonomously navigating a mock Mars environment, achieving a first place victory in the 2023 international competition.
- Developed a CAN and UART motor library in Python and C++ for use on robot manipulator and drivetrain motors.
- Gained experience integrating GPS and IMU in an rover autonomy stack.

Programmer Feb 2022 - Jul 2022

- Learned ROS and ROS2 through Python and C++ programming and hands-on robot testing.
- Gained proficiency in Ubuntu Linux by troubleshooting robot hardware and software.

Awards

Second Place, 2024 University Rover Challenge June 2024
Statler Research Scholarship Fall 2023, Spring 2024
First Place, 2023 University Rover Challenge June 2023

Publications

Smith, T., Butts, M., Adkins, N., Gu, Y., "Swarm of One: Bottom-up Emergence of Stable Robot Bodies from Identical Cells,"
IEEE/RSJ IROS 2023, Oct 2023.

Skills

Languages: Python, C, C++, JavaScript, MATLAB, Bash

Software: Ubuntu Linux, Git, ROS (Robot Operating System), ROS2, FreeRTOS, React, OpenCV

Hardware: GPS, IMU, LiDAR, Depth Cameras, Microcontrollers, UART, CAN, I2C

Engineering: System Integration, Technical Documentation, Software Design, Project Management