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

NSF-Funded REU Researcher — May 2023 – Aug 2023

- Researched creating real-time human safety maps in retail spaces using an autonomous mobile robot.
- Integrated an autonomous navigation system utilizing LiDAR, IMU, and SLAM algorithms in ROS2.
- Gained experience with ZED stereo cameras and Intel RealSense depth cameras.
- 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.
- 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 & Leadership

WVU University Rover Challenge Team, Morgantown, WV

Algorithms Lead — Aug 2023 – May 2025

- 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.
- Developed an autonomy system with a PRM global planner, SLAM-based local planner, and custom YOLO model.
- Built a React-based robot control interface including a map system, robot diagnostics, and live camera streams.
- Worked closely with mechanical engineers focusing on sensor placement, vibrations, and optimal camera FOVs.

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 a 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, SQL, 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