

ADITYA NAIR

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PORTFOLIO: 🌐 <https://adityanairs.website/>

EDUCATION

Northwestern University, Evanston, Illinois <i>Master of Science - Robotics</i>	Sep 2023 - Dec 2024 GPA: 3.9
Birla Institute of Technology and Science, Pilani, India <i>Bachelor of Engineering - Mechanical Engineering</i>	Aug 2019 - May 2023 GPA: 3.6

PROFESSIONAL EXPERIENCE

HEBI Robotics, Pittsburgh Robotics Software Engineering Intern	June 2024 - Sep 2024
<ul style="list-style-type: none">▷ Unified example scripts across C++, Python, MATLAB, and ROS2 APIs for modular robot arms and mobile bases, improving cross-platform usability, maintainability, and reducing length and complexity.▷ Identified and fixed critical bugs while contributing significant improvements to C++, Python, MATLAB, ROS2, C, and Java APIs, enhancing overall stability and functionality.▷ Developed demos showcasing advanced features like force control and sensor fusion, with video tutorials.	

RESEARCH EXPERIENCE

MARMot Lab, National University of Singapore Visiting Researcher Advisor: Dr. Guillaume Sartoretti	Aug 2022 - Aug 2023
<ul style="list-style-type: none">▷ Invented a novel optimal torque-control strategy in Python for hexapod robots, accomplishing payload carrying.▷ Developed Python Libraries for $SE(3)$ body-pose control of legged robots, using PyBullet.	
Robotics Research Centre, IIIT Hyderabad Research Assistant	May 2022 - Aug 2022
<ul style="list-style-type: none">▷ Implemented a Model-Predictive controller in Python for single-agent box pushing manipulation in PyBullet.▷ Designed and tested under-actuated perching mechanisms on drones for power line inspection.	

FEATURED PROJECTS

Learning bio-mimetic flight for Bird Robots with Koopman Operators	Apr 2024 - Dec 2024
▷ Developing active learning ROS2 packages for a bio-mimetic flying robot (MetaFly) using an OptiTrack system.	
Multi-Agent Reinforcement Learning Sim environment from scratch	Apr 2024 - June 2024
▷ Built an end-to-end physically accurate pipeline for Multi-Agent Exploration training in C++, from scratch.	
Search and Rescue Missing Person with Autonomous Robot Dog	Jan 2024 - Mar 2024
▷ 3D visual SLAM and outdoor frontier exploration on Unitree Go1 and Zed 2i in ROS2, C++, and Python.	
Dexterous Manipulation through Virtual Reality	Oct 2023 - Nov 2023
<ul style="list-style-type: none">▷ Developed a ROS2 pipeline in a team of 5 for teleoperation of a humanoid robot avatar with haptic feedback.▷ Created custom Python wrappers for the MoveIt2 API, and for position control in Gazebo.	
EKF SLAM pipeline in C++ from scratch	Jan 2024 - Mar 2024
▷ Programmed a complete ROS2 pipeline in C++ for SLAM on a Turtlebot, from scratch.	
Mobile Manipulation with KUKA youBot	Nov 2023 - Dec 2023
▷ Devised a controller for pick-and-place manipulation on an omnidirectional KUKA youBot, in MATLAB.	

TECHNICAL SKILLS

Programming	C++, CMake, Python, Git, Linux, Unit Testing, Bash, Docker, Java, Lua, Jekyll
Computer Vision	Visual SLAM, Feature Extraction, Object Detection, Segmentation, Deep Learning
Simulation	Gazebo, MuJoCo, PyBullet, CoppeliaSim, Webots, Simulink, ANSYS, Fusion360, Blender
ROS/ROS2 Packages	Nav2, SLAM_Toolbox, MoveIt2, TF2, AprilTag, RealSense2, Isaac ROS
Hardware	ABB, KUKA, NVIDIA Jetson, Unitree, Embedded C, RaspberryPi, Teensy, PIC32, Franka