

ADITYA NAIR

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PORTFOLIO: 🌐 <https://adityanairs.website/> | **YouTube:** 📺 @AdityaNairBuilds

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 Engineer Intern	June 2024 - Sep 2024
<ul style="list-style-type: none">▷ Standardized the C++, Python, MATLAB, and ROS2 APIs for robot arms, using a unified config file format to reduce code and improve cross-language compatibility.▷ Responsible for identifying and resolving critical bugs in C++, Python, MATLAB, ROS2, C, and Java APIs, which significantly improved system stability and functionality.▷ Developed robot arm demos showcasing features like force control and sensor fusion, with video tutorials.	

RESEARCH EXPERIENCE

MARMot Lab, National University of Singapore Lead Researcher - Bachelor's Thesis 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, for payload transport.▷ Developed Python Libraries for 6-DoF body-pose control of legged robots, using PyBullet.	
Robotics Research Center, IIIT Hyderabad Research Assistant	May 2022 - Aug 2022
<ul style="list-style-type: none">▷ Implemented a Model-Predictive Controller for non-prehensile pushing using a Turtlebot in PyBullet.▷ Designed and tested under-actuated perching mechanisms on drones for power line inspection.	

FEATURED PROJECTS

Data-Driven Control of an Agile Bio-Mimetic Aerial Robot	Apr 2024 - Dec 2024
▷ Developed control strategies for a bird-like robot using an OptiTrack motion capture system, in ROS2/Python.	
Multi-Agent Reinforcement Learning simulation environment from scratch	Apr 2024 - June 2024
▷ Built an end-to-end physically accurate training pipeline for Multi-Agent Exploration in ROS2.	
Search-and-Rescue with an 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 with Shadow-Hands 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.	
Navigation and Kalman Filter Localization of Self Driving Car	Nov 2023 - Dec 2023
▷ Simulated an autonomous car with waypoint navigation, localization, sensor fusion, and A* path planning.	

TECHNICAL SKILLS

Programming	C++ (8+ years), CMake, Python, Git, Linux, Unit Testing, Bash, Docker, Java, Lua
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	NVIDIA Jetson & GPUs, Embedded C, UDP/TCP, RaspberryPi, Teensy, PIC32, Franka