

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: 3.8
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
▷ Reliably integrating robotics algorithms into commercially available robots, utilizing ROS2, C++, and Python.	

RESEARCH EXPERIENCE

MARMot Lab, National University of Singapore Visiting Researcher Advisor: Dr. Guillaume Sartoretti	Aug 2022 - Aug 2023
▷ Invented a novel optimal torque-control strategy in Python for hexapod robots, accomplishing payload carrying.	
▷ Devised an optimal admittance control trajectory planner for lifting objects using a hexapod robot's front legs.	
Research Intern:	Apr 2022 - Aug 2022
▷ Developed a Python Library for $SE(3)$ body-pose control of legged robots, using PyBullet.	
Robotics Research Centre, IIIT Hyderabad Research Assistant	May 2022 - Aug 2022
▷ 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.	
Inspire Lab, BITS Pilani Undergraduate Researcher	Dec 2021 - May 2022
▷ Led a team in developing a ROS pipeline in Python for teleoperation of robot swarms (FireBird VI robots).	
▷ Implemented Iterative Closest Point (ICP) using PCL Library in Python for structural depth estimation.	

FEATURED PROJECTS

Bird Robot flight control with Koopman Operator (in progress)	Apr 2024 - Dec 2024
▷ Developing optimal control ROS2 packages for a bio-mimetic flying robot (MetaFly) using an OptiTrack system.	
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
▷ Developed a ROS2 pipeline in a team of 5 for teleoperation of a humanoid robot avatar with haptic feedback.	
▷ Created a custom Python wrapper for the MoveIt2 API.	
EKF SLAM pipeline in C++ from scratch	Jan 2024 - Mar 2024
▷ Programming 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
Robotics	Motion Planning, SLAM, Machine Learning, Computer Vision, Nonlinear Optimization
ROS/ROS2 Packages	Nav2, SLAM_Toolbox, MoveIt2, TF2, AprilTag, RealSense2, Isaac ROS
Simulation	Gazebo, MuJoCo, PyBullet, CoppeliaSim, Webots, Simulink, ANSYS, Fusion360, Blender
Hardware	ABB, KUKA, NVIDIA Jetson, Unitree, Embedded C, RaspberryPi, Teensy, PIC32, Franka