

ADITYA NAIR

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Portfolio: 🌐 adityanairs.website

EDUCATION

- ★ **Northwestern University, Evanston, Illinois** Sep 2023 - Aug 2024
Master of Science - Robotics GPA: 3.8/4.0
- ★ **Birla Institute of Technology and Science, Pilani, India** Aug 2019 - May 2023
Bachelor of Engineering - Mechanical Engineering GPA: 3.6/4.0

RESEARCH EXPERIENCE

- ★ **MARMot Lab, National University of Singapore** Apr 2022 - Present
Visiting Researcher | Advisor: [Dr. Guillaume Sartoretti](#)
 - ▷ Developed a hybrid motion-force controller for optimizing joint-torques of a hexapod robot, during load carrying and slope climbing.
 - ▷ Implemented admittance control and optimized trajectories for lifting objects using the hexapod's front legs.
 - ▷ Currently developing dynamics-informed Central Pattern Generator (CPG) for the hexapod.
- ★ **Robotics Research Centre, IIIT Hyderabad** Summer 2022
Research Assistant | Advisor: [Dr. Nagamanikandan Govindan](#)
 - ▷ Implemented a Linear Time Variant Model-Predictive Controller for single-agent box pushing manipulation.
 - ▷ Designed and tested under-actuated perching mechanisms for drones during power line inspection.
- ★ **Inspire Lab, BITS Pilani** Dec 2021 - May 2022
Undergraduate Researcher | Advisor: [Dr. Avinash Gautam](#)
 - ▷ Developed a ROS pipeline for teleoperation of robot swarms (Fire Bird VI robots).
 - ▷ Implemented Iterative Closest Point (ICP) on point clouds for structural depth estimation of cracks in walls.

WORK EXPERIENCE

- ★ **The Port of Singapore Authority - National University of Singapore** Oct 2022 - Jan 2023
Industrial Research Engineer
 - ▷ Engineered pioneering solutions at the intersection of robot design, control and motion planning for problems related to shipping container lashings.**Details sealed due to confidentiality**
- ★ **DomTech Robotics & Automation** Summer 2021
3D modelling & Automation Intern
 - ▷ Designed a 2-DoF automated welding positioner capable of handling torques up to 6000 Nm.

TECHNICAL SKILLS

Programming	C/C++, Python, Unit Testing, MATLAB, Bash, Java, Lua, SQL
ROS/ROS2 Packages	Nav2, Slam_Toolbox, MoveIt!, TF2, AprilTag, RealSense2, RViz2
Simulation	Gazebo, PyBullet, CoppeliaSim, Webots, Simulink, ANSYS, Fusion360, Blender
Python Libraries	SciPy, NumPy, SymPy, Matplotlib, Open3D, OpenCV, MediaPipe, Keras, DOLFIN
Microprocessors	Jetson Nano/Orin, NUC, Arduino, ESP32, RaspberryPi, Teensy

PUBLICATIONS

1. "Joint-Torque Optimization for Legged Robots during Payload Carrying Operations"
Nair A, Khurana S, Sartoretti G
To be submitted to the *IEEE Conference on Intelligent Robots and Systems (2024)*.
2. "Legged Robots for Object Manipulation: A Review" | [Paper](#)
Gong Y, Sun G, **Nair A**, Bidwai A, CS R, Grezmak J, Sartoretti G, Daltorio KA
Published in *Frontiers in Mechanical Engineering*.