# Anshul Raje

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U.S. Citizen — No sponsorship required

## EDUCATION

**Worcester Polytechnic Institute** — *Aug 2026 — Present*
*M.Sc. Robotics Engineering* — Worcester, MA

**BITS Pilani, K.K. Birla Goa Campus** — *Sept 2020 — Jul 2024*
*B.E. Electronics and Communication Engineering — GPA: 3.401/4.0* — Goa, India

## EXPERIENCE

**Strider Robotics** — *Aug 2024 — Apr 2026*
*Associate Robotics Engineer* — Bangalore, India
*Autonomy & Perception (Jan 2026 – Apr 2026)*

- **Perception Orchestration Framework:** Designed and built a 5-layer modular ROS 2 architecture for industrial inspection robots, separating hardware drivers, CV application nodes, and task orchestration — deployed on quadruped robots for client's field operations.
- **Config-Driven Task Execution:** Architected a behavior tree–based orchestrator with ROS 2 lifecycle management, enabling new perception tasks to be implemented in ∼200 lines of code (80% YAML); deployed across multiple clients.
- **Computer Vision Pipelines:** Developed ROS 2 nodes for analog gauge reading and fire extinguisher detection using YOLO models trained on custom datasets via Ultralytics, integrated as independently testable lifecycle nodes.

*Systems & Controls (Aug 2024 – Dec 2025)*

- **Robust Locomotion:** Enhanced quadruped reliability by integrating MPC-based control with foothold optimisation for stable traversal on uneven terrain; developed fall recovery strategies for autonomous self-righting.
- **State Estimation:** Designed a Kalman filter–based state estimator fusing IMU, joint encoder, and foot contact data to enable reliable localisation in GPS-denied environments.
- **Actuator Characterisation:** Built automated testing pipelines to identify actuator dynamics, reducing sim-to-real discrepancies and accelerating reinforcement learning experiments.

**HiPeRT Lab, University of Modena and Reggio Emilia** — *Jul 2023 — Dec 2023*
*Research Intern — Robotics and Intelligent Systems* — Modena, Italy

- **Computer Vision:** Developed a novel algorithm for synthetic dataset generation; trained YOLOv4 on a synthetic dataset of 1500+ images, achieving 97% detection accuracy for opponent vehicle localisation.
- **Motion Planning & Control:** Developed and integrated an MPC-curve controller into the autonomous race car, achieving a mean lateral error of <2 cm, replacing the underperforming Pure Pursuit controller.

**Spaceonova** — *Jan 2022 — Apr 2022*
*Technical Trainer* — Bihar, India

- Delivered robotics lectures to 250+ students covering Robot Modeling, Path Planning, and Object Detection.
- Demonstrated practical implementations using Gazebo simulation and Pygame.

## PROJECTS

**Project Kratos — Mars Rover Team | Controls Lead** — *Sept 2021 — May 2023*
*Faculty Advisor: Dr. Toby Joseph* — BITS Goa

- Student-designed Mars Rover capable of autonomous terrain traversal, life-sign detection, and robotic manipulation.
- **Perception & Path Following:** Implemented Stanley Controller for waypoint tracking within 5 cm accuracy; integrated YOLOv3 trained on a custom dataset for real-time obstacle detection.
- **Manipulator:** Developed Forward and Inverse Kinematics algorithms to precisely control a 5-DOF on-rover manipulator.

## SKILLS

**Languages:** Python, C/C++
**Tools & Frameworks:** ROS, ROS 2, ROS 2 Control, RViz, Gazebo, OpenCV, Docker, Git, Linux

## ACHIEVEMENTS

- **2nd Place Globally, Anatolian Rover Challenge (Jul 2022):** Placed 2nd internationally in Istanbul, Turkey; won Best Autonomous and Controls Vertical and Best Science Vertical.
- **Excellence Award, International Rover Challenge (Jan 2023):** Received the Excellence Award for Overall Performance at the International Rover Challenge, Bangalore, India.