

ADITYA KOTHARI

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EDUCATION

Stanford University

Sep 2025 – Mar 2027

MS in Aeronautics and Astronautics — GPA: 4.0/4.0

Stanford, CA

- NSF Scholar 25 | KC Mahindra Scholar 25 | JITO JEAP Scholar 25
- Relevant Coursework: **Robot Autonomy** (Multi-Robot Systems), **State Estimation**, Model Order Reduction.

Vellore Institute of Technology

Jul 2021 – Jul 2025

BS in Mechanical Engineering — GPA: 4.0/4.0

Vellore, India

- Merit Scholarship Award 2022–2025 | Student Achiever Awards 2024 & 2025

TECHNICAL SKILLS

- **Robotics & Autonomy:** ROS2, C++, Python, Gazebo, **Human-Robot Collaboration**, SLAM, Path Planning (A*, DWA).
- **Control & Learning:** **Reinforcement Learning (RL)**, MPC, PID, Extended Kalman Filter (EKF), Human-Robot Interaction (HRI).
- **Tools & Infrastructure:** Linux, Git, Docker, PyBullet, OpenCV, High-Performance Computing (HPC), Physics-Informed ML.
- **Domain Knowledge:** CFD (Ansys Fluent), FEM, Model Reduction, Navigation, Sensor Fusion (LiDAR/Vision), Collision Avoidance.

ROBOTICS & AUTONOMY PROJECTS

LangDrive: Language-Steered Autonomous Driving | *Gen-AI, Vision-Language Models, CARLA*

Dec 2025

- Developed a **hierarchical autonomy stack** by integrating **Vision-Language Models (VLMs)** for high-level decision making in autonomous vehicles in the **CARLA** simulator.
- Implemented a natural language interface using **LLaVA VLM** and RGB camera feed to process human commands, enabling the vehicle to reason about safety constraints and execute temporal maneuvers.
- Designed the control bridge to translate VLM outputs into actionable low-level steering and throttle commands, validating the pipeline in urban driving scenarios leading to safe behavior in $\approx 75\%$ cases with prompting.

Autonomous Ground Robot: On-Robot Autonomy Stack | *ROS2, C++, Gazebo*

Sep 2025

- Architected a modular **on-robot autonomy stack** in **ROS2/C++**, implementing sensor fusion via **EKF** and robust global localization using **Particle Filters (MCL)**.
- Integrated YOLO-based perception with **Occupancy Grid Mapping** to inform a hybrid planner (A* global + DWA local) for safe navigation in **cluttered, dynamic environments** akin to human-robot workspaces.
- Designed a trajectory tracking controller to minimize cross-track error, validating system robustness through extensive **real-world** and simulation testing.

Hierarchical RL for Robust Robotic Control | *Python, PyBullet, Research*

Nov 2025

- Architected a decoupled policy stack using **Soft Actor-Critic (SAC)** for high-level planning and **PPO** for low-level force control, outperforming non-hierarchical methods by **5x** for long-horizon **object manipulation and placement** tasks.
- Modeled the system as a POMDP to handle high relative noise, **upto 40% object half-length**, effectively mitigating compounding errors in long-horizon tasks.
- Designed a **custom dense reward** function with stability heuristics, ensuring robust **sim-to-real** transfer capabilities.

ENGINEERING EXPERIENCE

Stanford Multi-Robot Systems Lab

Jan 2026 – Present

Student Researcher

Stanford, CA

- Developing a semantic feature extraction layer for autonomous navigation using egocentric vision data from 3D Gaussian Splats.
- Designing a model that can autonomously follow complex language guided navigation tasks through the world using this novel sparse feature only world representation trained in a 3D-GS simulation environment.

BOEING

May 2024 – Jul 2024

Engineering Intern (Software Tools)

Chennai, India

- Developed Python-based tools to maintain and **automate engineering databases**, reducing **design release time** by **30%**.
- Collaborated with cross-functional teams to conduct Value Stream Mapping and deploy software solutions and tools that improved **safety validation** workflows reducing total cycle time by **7.8%**.

Team Veloce (University UAV and Robotics Team)

Apr 2022 – May 2024

Team Captain & Technical Lead

Vellore, India

- Directed a collaborative engineering team of 25 to develop and deploy a **fleet of 7 UAVs/Robots**.
- Oversaw the full software lifecycle, from algorithm development to **on-robot deployment** and field testing.
- Implemented rigorous system integration testing to ensure reliability across multiple robotic platforms.

ACHIEVEMENTS

Rank 1: GKN Aerospace Sustainable Aviation Challenge (INR 300,000 Prize)

Nov 2023

Rank 3: AIRBUS National Flight Challenge - Safety Systems

Feb 2024

Publication: Results in Engineering (Elsevier, JIF: 7.9), [Grain Boundary and micro-texture evolution in GRCo Alloys](#)

Feb 2025

Patent: *Wear Analysis Equipment* (2025), Patent 202541056455

| *Electronic Spherical Steam Trap* (2024), Patent 427140-001