

# RONISH NADAR

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## SUMMARY

Robotics / embedded engineer (NYU M.S. Mechatronics and Robotics) building autonomous systems across perception, planning, and control. Experienced with ROS 2, firmware, sensor fusion, and real-time integration for robotics deployments.

## SKILLS

**Languages:** C, C++, Python, MATLAB  
**Robotics:** ROS 2, SLAM, A\*/RRT\*, Nav stacks, Pure Pursuit, PID/LQR/MPC, System Identification  
**Perception/AI:** OpenCV, YOLO, ArUco/AprilTag, VLM/LLM integration, PyTorch  
**Embedded:** STM32/ESP32/RPi/Jetson; UART/I<sup>2</sup>C/SPI/CAN/RS485; Wi-Fi/BLE/LoRa; PCB (Altium/KiCad/Eagle)

## EXPERIENCE

**Graduate Research Assistant — NYU Mechatronics Lab** Jun 2025 – Present  
*Embodied AI for multi-robot autonomy (LLM/VLM + planning + control)* New York, NY

- **Engineered** zero-code LLM/VLM pipeline with **GUI** for high-level reasoning and task execution (pick/place, sorting).
- **Produced** a full autonomy stack: **multi-camera** perception → **RRT\*** (online replanning) → **Pure Pursuit/PID** for precision docking.
- Demonstrated real-robot experiments across multi-robot task coordination; **orchestrated** a **ZeroMQ/CBOR** RPC layer with multi-comm bridge (**Wi-Fi/BLE/ESP-NOW**) for low-latency control.

**Graduate Teaching Assistant — NYU Tandon, MAE Department** Sep 2025 – Present  
*Automatic Controls & Mechatronics Laboratories* New York, NY

- **Redesigned Automatic Controls** curriculum; **crafted Arduino** experiments for real-time **PID/LQR** and **system ID**.
- **Headed Mechatronics** lab support for **embedded bring-up**, **sensors/actuators**, and **discrete-time** feedback control.

**Embedded Systems Engineer — Utopia Tech (EazyIoT)** Jul 2023 – Jul 2024  
*IoT Energy Monitoring Systems* Mumbai, India

- Shipped **production firmware** and designed **PCB** for **IoT devices** deployed at **10,000+ units**; **minimized** device downtime by ~17%.
- **Built** automated factory test jigs, cutting validation cycle from **14 days** to **3 days** (**4.6×** throughput).
- **Programmed** **STM32/ESP32** communication stacks and **HMI** for field configuration and diagnostics.

## EDUCATION

**New York University, Tandon School of Engineering** 2024 – 2026  
*M.S. Mechatronics & Robotics* ◇ *GPA: 3.917* New York, NY

**University of Mumbai** 2019 – 2023  
*B.E. Electronics & Telecommunications* ◇ *GPA: 3.8* Mumbai, India

## PROJECTS

**Dual Track Ackermann Drive Simulation + Control (Hybrid A\* / SMC)** Sep 2025 – Dec 2025

- Modeled **double-track Ackermann dynamics** and **executed SMC** tracking for curvature-constrained paths; **diminished** tracking error by **35%** compared to baseline PID.
- **Validated Hybrid A\*** planning + closed-loop tracking in obstacle scenarios; improved success rate by **40%** while enforcing steering/torque constraints at **100 Hz**.

**Mapping Robot: SONAR Point Cloud + ROS 2 Visualization** Sep 2024 – Dec 2024

- **Fabricated** an **ESP32 Micro-ROS** pipeline streaming sensor data to **ROS 2** at **50 Hz**; increased map update stability by **45%** and visualized **point clouds** in **RViz**.
- **Synthesized IMU + encoder fusion** for **pose estimation** and **slashed pub/sub latency** by **25%**.

**TATA Power: 110 kV Insulator Cleaning Robot** Aug 2022 – Jan 2023

- **Spearheaded** a **4-DoF SCARA manipulator** for **110 kV** environments; **formulated IK** and **motion planning** achieving **±8 mm** precision.
- Architected **EMI-hardened hardware** using optocouplers and Faraday shielding that **mitigated** diagnostic downtime by **50%** via distributed firmware.
- **Integrated IR thermography** for hotspot detection and **OpenCV** for line-following; **cut** inspection time by **3×** and improved consistency by **65%**.