

Srividya Srinivas

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Robotics & Controls – Autonomous Systems, Mechatronics, Embedded Hardware & System Integration

Education

Columbia University – M.S. Mechanical Engineering, Robotics & Controls
Amrita Vishwa Vidyapeetham – B.Tech Electronics and Communication Engineering

New York, NY | Expected Dec 2026
Bengaluru, India | Jun 2025

Experience

Graduate Researcher – Creative Machines Lab, Columbia University

May 2026–Present

Aerial Robotics / Multisensor Integration / Mechatronics

New York, NY

- Building and integrating a **5 kg MTOW pressure-washing UAV** for facade cleaning, combining **Pixhawk flight control, camera/LiDAR sensing, propulsion, washer actuation, payload electronics, and tethered power/fluid delivery** across sensing, electrical, compute, and mechanical subsystems.
- Evaluated **~4.52 kg onboard-washer vs. ~4.05 kg tethered architectures**, quantifying payload margin and the effects of washer/hose/fluid mass, thrust availability, and facade-proximity constraints on system feasibility.
- Characterized the **18 V Ryobi washer power path**, including a **~25 A startup surge against a 12.55 A bench-supply limit**, and developed the ground-controlled relay/trigger interface for remote actuation.
- Debugging **camera–LiDAR misalignment, reflective-surface sensing failures, noisy serial TX/RX, recoil-induced disturbances, and electrical/interface faults** through subsystem isolation, calibration, repeated bench tests, and integrated hardware trials.

Teaching Assistant – MEMS Sensors and Systems, Columbia University

Jan 2026–May 2026

Sensors / Instrumentation / Experimental Validation

New York, NY

- Sole TA for a **40-student laboratory course** covering sensor characterization, ADC calibration, signal conditioning, electrical-noise analysis, circuit testing, measurement uncertainty, Python data analysis, and repeatable experimental evaluation using bench instrumentation.

Undergraduate Thesis Researcher – Indian Institute of Science

Sep 2024–Jun 2025

Embedded Vision / Edge ML / Electromechanical Control

Bengaluru, India

- Developed and tested an **AI-controlled EV prototype** integrating power electronics, motor control, ESP32-CAM image acquisition, and **PyTorch YOLOv8 perception**, connecting embedded vision to physical-system control; published at **IEEE ICCECE 2025**.

Robotics Intern – ARTPARK AI & Robotics Technology Park @ IISc

Jun 2024–Jul 2024

Perception / Localization / Physical Robot Integration

Bengaluru, India

- Integrated **LiDAR, IMU, onboard compute, perception, localization, and ROS2/Nav2** on a physical autonomous robot; configured waypoint execution and recovery behavior while diagnosing sensing, communication, localization, hardware, and runtime failures across simulation and real-world testing.
- Validated obstacle-aware patrol and real-time visual threat-detection behavior in repeated hardware trials, achieving **>90% detection accuracy**.

Founder & Team Lead – Team Odyssey, Mars Rover Team

Sep 2023–Sep 2024

Field Robotics / Electromechanical Systems

Bengaluru, India

- Founded and led a **30-member rover team** integrating ROS2, LiDAR, Intel RealSense, Jetson Nano, Arduino Mega, A* path planning, motor control, power distribution, communications, and mechanical subsystems; led full-system integration for ISRO IROC, securing **Top 30 nationally**.

Selected Robotics & Mechatronics Projects

DockSight – Visibility-Aware Vision-Guided Robot Docking

Raspberry Pi, Python, OpenCV, AprilTag

- Built a physical differential-drive docking robot with a complete **camera-to-control pipeline**, estimating AprilTag bearing/distance, calibrating asymmetric motor response, and implementing **SEARCH / ALIGN / APPROACH / RECENTER / DOCK / TAG-LOSS** states with immediate safe-stop on target loss.

Autonomous Mobile Robot Patrol System

ROS2, Nav2, AMCL, LiDAR, Gazebo

- Implemented localization and autonomous navigation with AMCL/Nav2, waypoint execution, timeout/retry logic, costmap recovery, and dynamic-obstacle validation; debugged odometry drift, perception edge cases, and simulation-to-real behavior on the physical platform.

Adaptive Industrial Sorting System

Raspberry Pi, Camera, IMU, PCA9685, I²C

- Integrated vision, inertial sensing, embedded compute, and robotic-arm actuation; implemented **grasp-failure detection, automatic retry, and recovery logic** for closed-loop manipulation.

8-DOF Quadruped Robot

Raspberry Pi, LX-16A Servos, MuJoCo

- Built and integrated an **8-DOF physical quadruped** using LX-16A serial-bus actuators; developed coordinated gait/control workflows and evaluated stabilization and sim-to-real behavior in MuJoCo.

Directional Piezoelectric Microphone

COMSOL, LTspice

- Designed a segmented-electrode piezoelectric sensor for directional acoustic sensing; modeled electromechanical response in COMSOL and developed a charge-amplifier signal-conditioning front end in LTspice.

Technical Skills

Robotics / Controls: ROS2, Nav2, AMCL, SLAM, A*, AprilTag, OpenCV, state-machine control, feedback control, MPC, Pixhawk/ArduPilot, LiDAR/IMU/Intel RealSense integration

Embedded / Hardware: Raspberry Pi, Jetson Nano, Arduino, ESP32, PCA9685, cameras, motor drivers, ESCs, relays, PWM, ADC, UART/serial, I²C, SPI, LiPo systems, power distribution, hardware-software integration

Software / Modeling / CAD: Python, C, Linux, SSH, Git, MATLAB, Fusion 360, Onshape, COMSOL Multiphysics, LTspice, Gazebo, MuJoCo, Isaac Sim, PyTorch, JAX

Test / Instrumentation: Sensor calibration, experimental validation, failure isolation, root-cause troubleshooting, measurement uncertainty, multimeter, oscilloscope, bench power supply, technical documentation

Publications & Awards

IEEE ICCECE 2025 – IISc Bengaluru | Top 10 Finalist – 2025 DETermined Scholarship, Duolingo English Test × Office of the Principal Scientific Adviser, Govt. of India | Global 5th Place – IDC Robocon 2024 | Top 30 – ISRO IROC'24