

SUMMARY

First generation graduate with hands-on experience in robotics and hardware performance testing. Skilled in prototype bring-up, validation, qualification, and failure analysis of server technologies. Proficient in Python test automation, lab infrastructure management, and supporting hardware design and qualification teams. Focused on custom silicon solutions through system regression testing, DUT validation, and scalable test automation.

EXPERIENCE

Assistant Specialist, Department of Mechanical Engineering, UC Riverside, CA

Jul 2025 – Present

- Leading research to enhance safety and performance of robotic cutting systems, implementing impedance control strategies for safe physical interaction and system compliance with variable external forces.
- Developing algorithmic solutions for robotic behavior analysis under dynamic conditions, conducting comprehensive data collection, annotation, and system testing protocols for hardware validation.

Graduate Student Researcher at RaMS Laboratory, UC Riverside, CA

Apr 2024 – Jul 2025

- Developed Python automation test scripts for robotic hardware validation and system performance regression testing, achieving 87% trajectory tracking accuracy through systematic failure reproduction protocols.
- Executed prototype bring-up and hardware-in-the-loop testing for 7-DOF robotic systems, validating CPU, memory, storage, and high-speed interconnect performance against technical specifications.

Teaching Assistant University of California, Riverside, CA

Oct 2024 – Jan 2025

- Supervised Supervised prototype bring-up and validation testing for embedded sensing and motion control systems, coordinating hardware development lab resources and project planning activities.
- Conducted code-led debugging sessions and hardware-in-the-loop testing to verify functionality against device specifications, technical drawings, schematics, and datasheets.

System Integration Engineer Mother Miracle Trust, India

Dec 2021 – Jul 2023

- Deployed network, power and cooling infrastructure for hardware development labs with QoS optimization for multi-robot test systems, ensuring remote control functionality and operational reliability
- Assembled, configured, and performed diagnostics on 100+ embedded control units implementing Device-under-Test validation protocols and preventive maintenance schedules, reducing system downtime by 30%

SKILLS

Hardware Platforms: KUKA, Arduino, ESP32, Raspberry Pi, Jetson Nano/TX2, Kinova Gen3 (7-DOF) +2F-140, ViperX300S, Robotiq 2F-85/2F-140, embedded control units, Device-under-Test (DUT) interfaces.

Manufacturing & Fabrication: CNC milling/turning, FDM 3D printing, SolidWorks, AutoCAD, GD&T, Six Sigma, dimensional verification, preventive maintenance, root cause analysis.

Testing & Validation: Prototype bring-up, validation, qualification testing, failure analysis, system performance regression testing, Device-under-Test (DUT) validation, HIL testing, QA/QC, Python automation test scripts, external smart measurement instrumentation synchronization.

Frameworks & Tools: ROS1, ROS2, OpenCV, TensorFlow, PyTorch, Git, LabVIEW, MATLAB Robotics Toolbox, Linux/Unix operating systems, shell scripts.

Motion Planning & Perception: Kalman filtering, forward/inverse kinematics, impedance/admittance control, Zhang & Tsai – Lenz calibration, multi-sensor fusion, vision-guided robotics.

Programming Languages: Python, C/C++, Bash, MATLAB, Simulink.

Lab Management & Infrastructure: Hardware development labs design, network/power/cooling infrastructure, remote control functionality, fleet management of test systems, quality data collection systems, safe working environment maintenance.

PROJECTS

4-DOF Autonomous Room-Cleaning Robot: Autonomous cleaning robot with LiDAR-SLAM (Cartographer); achieved 81% area coverage and 30% faster operation using synchronized arm trajectories and A*/RRT* path planning.

Self-Checkout System: TensorFlow vision pipeline with multi-object tracking; improved processing speed by 40% and accuracy by 20% using INT8 quantization and model pruning.

Litter Locator Drone: Drone with YOLOv5 object detection; achieved 90% accuracy and 35% faster inference on Jetson Nano via quantization and pipeline optimization.

Lane Curvature Detection: Bezier curve fitting with Kalman filtering; improved road curvature estimation accuracy by 15% over Hough Transform on TuSimple dataset.

EDUCATION

University of California, Riverside

Sept 2023 – Mar 2025

M.S. in Robotics, Automation, and Mechatronics

Relevant Coursework: Edge Computing, Foundations of Robotics, Design and Fabrication of Robots, Advanced Computer Vision, Deep Learning, Machine Learning, Computational Methods for Robotics

Uttarakhand Technical University, India

Aug 2017 – Oct 2021

B. Tech in Mechanical Engineering

Relevant Coursework: Manufacturing Science, Kinematics of Machines, Strength of Materials, Concepts of Programming and OOPs, CAD/CAM, Six Sigma and Applications

PUBLICATIONS

[Fire Fighting Robot](#), *International Journal of All Research Education and Scientific Methods (IJARESM)*, 2021.