Bhushan Ravikumar

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Skills

Languages Python, C++, Javascript, SQL, VBA
Data Analysis Excel, MATLAB, Minitab, Alteryx
Toolchain Jama Connect, Jira, Agile, Labview
CAD Solidworks, Fusion 360, Siemens NX
CAE ANSYS, Ricardo WAVE
Packages ROS, Scipy, OpenCV, Pytorch, Tensorflow

Education

University of Minnesota, Twin Cities **Dec 2025**
Masters of Science in Robotics

PES University **May 2022**
Bachelor of Technology in Mechanical Engineering

Experience

Bracco Medical Technologies **Minneapolis, MN**
Systems Engineer *May 2025 – Present*

- Executed **comprehensive characterization testing** for **contrast-delivery platforms**, ran 100+ bench and simulated-use tests, performed **root-cause analyses**, and contributed to remediation plans that closed 80% of system-level non-conformities, helping the team reach **design freeze**.
- Authored and automated 40+ risk-based **System & System-Software V&V test cases** (20% of the program's total coverage), designed custom **electromechanical fixtures and Python/LabVIEW scripts** that **cut testing time 35% and delivered 100% traceability in Jama**.
- Engineered a **closed-loop reliability rig** to generate high-resolution lifecycle data that informed next-generation requirements and product-roadmap decisions in collaboration with principal engineers.
- Optimized **PID control** algorithms to smooth out high irregularities in motor control, resulting in improved system stability and performance

Ambient Intelligence **Minneapolis, MN**
R&D Engineer *Aug 2024 – May 2025*

- Designed and developed a **fall detection system for Alzheimer's patients** using mmWave sensors and Raspberry Pi, involving custom calibration, code development, and point-cloud data preprocessing for accurate detection.
- **Led product development from prototype to testing**, including 3D-printed enclosures and **regulatory-aligned device validation, ensuring reliability, durability, and healthcare compliance**.
- Integrated multiple devices to communicate with **AWS IoT using MQTT**, facilitating real-time data streaming, device status updates, and remote control capabilities for **comprehensive patient monitoring**.

University of Minnesota **Minneapolis, MN**
Research Assistant *Jan 2025 – May 2025*

- Designed and developed a test bench with embedded hardware and rapid prototyping(3D printing and machining) for **data-driven control of UAV engines**, enabling real-time performance analysis and optimization.
- Implemented system identification and **adaptive control algorithms** in MATLAB to enhance UAV engine efficiency and reliability.

KPMG **Bangalore, India**
Associate Analyst *Jul 2022 – Aug 2023*

- Analyzed large-scale trade data for Carrier Corp and Stellantis, achieving **$10.4 million in cost savings** by identifying favorable tariff rates and reducing import duties.
- Led a cross-functional initiative to **streamline data pipelines (Python, Excel/VBA)** and introduced a standardized reporting structure, reducing process time by 15%

Moog Inc. **Bangalore, India**
Mechanical Engineer Intern *Sept 2021 – Dec 2021*

- Conducted rigorous **Qualification and Acceptance testing** for the Geared Rotary Motor deployed in the Comac 919 Aircraft. Utilised **MATLAB** to create customised test paths for various test rigs, leading to a streamlined testing process and improved data analysis.
- Managed the execution of the Inboard Aileron Servo Control **endurance test**, ensuring accurate and reliable data collection. Successfully configured test equipment, resulting in a 10% increase in test accuracy.

Projects

HapticTelegraph Teleoperation With Variable Time Delay for Surgical Robots

- Built a haptic teleoperation system with simulated delay (0–500ms variance) using Python and embedded hardware; ran 30+ trials across 5 conditions to evaluate system responsiveness.
- Found task failures increased by 67% at 200ms variance and completion time peaked at 0.3s latency, highlighting delay thresholds critical for precision teleoperation.

Multi-Robot Simulation in Warehouse Environment

- Developed a simulation package in ROS and Gazebo, incorporating YOLO v5 for object perception, DH parameters for precise manipulation, and Inverse Kinematics for efficient pick-and-place operations.
- Integrated Anytime Repairing A* with Model Predictive Control for pallet truck navigation, optimizing navigation to achieve a 78% success rate.

Semantic Segmentation for Autonomous Driving in Urban Scenes

- Optimized FasterSeg architecture and augmented the Cityscapes dataset for semantic segmentation of urban scenes in autonomous vehicles using TensorFlow, reducing the training period by 15% and improving categorical accuracy with a mean Intersection over Union (mIoU) of 69.78