

# Vaibhav Raheja

[✉ vaibhavrasha@gmail.com](mailto:vaibhavrasha@gmail.com) [📞 +1 \(217\) 2029970](tel:+1(217)2029970) [LinkedIn](https://linkedin.com/in/Vaibhav-Raheja) [Portfolio](#) [Vaibhav-Raheja](#)

## WORK EXPERIENCE

<b>EarthSense, Inc</b> <a href="#">🔗</a>	Aug 2024 – Present Champaign, USA
<i>Robotics Integration Engineer / Project Lead</i>	
<ul style="list-style-type: none"><li>Led Solarbot project team of 8+ engineers as <b>Project Lead</b>, coordinating sensor integration architecture and cross-functional alignment between engineering, operations, and customers</li><li>Contributed 35+ merged PRs across <b>robotics stack in C++ and Python</b>, including safety-critical motion control, AWS Kinesis teleoperation system, multi-camera integration, and telemetry infrastructure</li><li>Integrated multi-sensor perception stack (Hesai LiDAR, PTZ cameras, thermal imaging) using ROS2 with Docker-based deployment pipeline</li><li>Directed field deployments across 2 solar farm sites, troubleshooting hardware failures and validating sensor performance in extreme conditions (43-46°C)</li></ul>	
<b>Intelligent Motion Laboratory</b>	Aug 2023 – Dec 2023 Champaign, USA
<i>Robotics Research Developer</i>	
<ul style="list-style-type: none"><li>Built a vision-based head pose estimation system for <b>autonomous robotic eye examinations</b>, achieving sub-2mm tracking accuracy using MediaPipe FaceMesh and ZED depth cameras on UR5</li></ul>	
<b>All India Institute of Medical Sciences (AIIMS) Hospital</b>	Feb 2021 – May 2023 Mumbai, India
<i>Robotics Research Developer - NMIMS</i>	
<ul style="list-style-type: none"><li>Engineered <b>robot-assisted intubation system on xArm5</b> with HOTAS-based teleoperation and real-time camera feedback for critical care procedures</li><li>Fabricated custom catheter end-effector with integrated miniature camera for real-time airway visualization</li></ul>	

## EDUCATION

<b>University of Illinois Urbana-Champaign</b>	Aug 2023 – Dec 2024
Master's of Engineering <b>Autonomy and Robotics</b>	Champaign, USA
<b>Mukesh Patel School of Technology Management &amp; Engineering</b>	Jul 2019 – Jun 2023
Bachelor of Technology in <b>Computer Engineering</b>	Mumbai, India

## PUBLICATIONS

V. Raheja, V. Shah, M. Shetty, P. Patel, and M. Tiwari, "Multi-Disease Prediction System using Machine Learning," 2022 International Conference on Futuristic Technologies (INCOFT), Belgaum, India, 2022, pp. 1-6, doi: 10.1109/INCOFT55651.2022.10094382 [🔗](#).

## PROJECTS

<b>Benchmarking Control Algorithms for Unitree Go1 Robot</b> <a href="#">🔗</a>	
<i>Python, ISAAC Sim, Reinforcement learning</i>	
<ul style="list-style-type: none"><li>Implemented benchmarking framework to evaluate factory controller vs. RL-based locomotion algorithms on Unitree Go1 quadruped in ISAAC Sim</li><li>Deployed and tested "Walk These Ways" RL controller on physical Go1 robot across varied terrain (grass, gravel, inclines)</li><li>Compared velocity tracking, stability, and terrain adaptability between RL and model-based control approaches</li></ul>	
<b>Intelligent Ground Vehicle Competition (IGVC)</b> <a href="#">🔗</a>	
<i>Python, ROS, OpenCV, PID Control, Path Planning, CAD</i>	
<ul style="list-style-type: none"><li>Led team to 2nd and 3rd place finishes in Cyber and Auto-Nav challenges with an autonomous ground vehicle featuring end-to-end path planning and obstacle avoidance</li><li>Implemented a multi-sensor perception pipeline (cameras, GPS, IMU) with lane detection, object avoidance, and GPS waypoint navigation, achieving 90% navigation accuracy</li><li>Designed and fabricated robot chassis with integrated sensor mounts using CAD and 3D printing, implementing low-level motor control via Arduino/Raspberry Pi</li></ul>	
<b>GRAIC Autonomous Racing</b> <a href="#">🔗</a>	
<i>Python, Hybrid A*, Path Planning, PD Control, Vehicle Dynamics</i>	
<ul style="list-style-type: none"><li>Designed a Hybrid A* path planner for autonomous racing at 70+ km/h, incorporating vehicle kinematics, turning radius constraints, and non-holonomic dynamics for real-time trajectory generation</li><li>Tuned PD controller for steering and velocity control, achieving 40.8% lap time improvement over baseline on the Shanghai circuit with dynamic obstacle avoidance</li><li>Compared three path planning algorithms (Hybrid A*, Dynamic Programming, Spline Interpolation) to optimize racing line and lap time performance</li></ul>	

## SKILLS

**Programming:** Python, C++, ROS/ROS2, OpenCV, PyTorch, Machine Learning (ML), CNNs

**Robotics & Perception:** LiDAR Integration (Hesai), Multi-Sensor Fusion, Camera Calibration, Path Planning, Motion Planning, Control Algorithms, Reinforcement Learning, Gazebo, SLAM, Docker

**Tools:** Linux, Git, Fusion 360, CAD, Arduino, Raspberry Pi, 3D Printing