Harsh Bhargav
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PROFESSIONAL EXPERIENCE

Associate Software Developer Intern
Maya Data Privacy, Dublin, Ireland — Jan 2024 – June 2024

- Developed and maintained the company website using React, ensuring a responsive and user-friendly interface.
- Utilized LangChain to train and integrate AI models (LLMs) into the web interface, enhancing data privacy and security.
- Collaborated with cross-functional teams to implement and optimize AI-driven features on the website and contributed to the overall design and architecture of the web application, focusing on scalability and performance.
- Conducted testing and debugging to ensure the seamless functionality of AI integrations with the web platform.

Control System Engineer
Talisha Space Research Organization, Durgapur, India — Nov 2023 - Dec 2024

- Developed Model Predictive Control (MPC) for autonomous rocket landing, optimizing descent trajectory.
- Designed and tuned PID controllers for precise thrust vectoring, ensuring stable orientation during landing.
- Simulated and analyzed control algorithms to enhance landing accuracy and system robustness.
- Conducted Hardware-in-the-Loop (HIL) testing to validate real-time control strategies and improve reliability.
- Collaborated with propulsion and avionics teams to integrate advanced control systems for seamless landing.

Robotics Engineer
AKSI Aerospace, Telangana, India — Feb 2026 - Current

- Developed and deployed multi-sensor fusion pipelines for UAV state estimation, integrating IMU, LiDAR, and vision data using advanced filtering techniques (e.g., ESKF) for robust navigation in real-world conditions.
- Built and validated high-fidelity simulation environments in Gazebo, enabling seamless transition of algorithms from simulation to hardware (Sim2Real) for autonomous drone systems.
- Engineered end-to-end UAV software stack integration, including real-time communication between onboard systems and ground control, ensuring reliable command, telemetry, and data flow.
- Performed control system design and optimization, including PID tuning based on flight log analysis, improving stability, response time, and disturbance rejection during real flight operations.

PROJECTS

Collision-Tolerant Indoor Inspection Drone

- Designed and developed a collision-resilient UAV for GPS-denied environments, integrating a protective frame with robust flight control to enable stable operation in confined spaces.
- Implemented LiDAR–Visual–Inertial Odometry (LIVO) using Ouster OS LiDAR and Intel RealSense, fused via Error-State Kalman Filter (ESKF) for real-time state estimation and drift minimization.
- Built a complete control and simulation pipeline, including PID tuning, flight log analysis, and Hardware-in-the-Loop (HIL) testing to validate navigation and stability under real-world disturbances.
- Developed autonomous navigation and mapping stack, enabling reliable flight in low-visibility, cluttered environments with sensor fusion, SLAM integration, and post-flight performance analysis.

Autonomous Rover

- Simulated a 6-wheeled autonomous lunar rover in Gazebo, creating realistic test environments to validate navigation algorithms.
- Visualized sensor data in RViz, performing real-time localization and mapping to enhance the rover's environmental awareness.
- Executed sensor fusion in ROS, combining data from LIDAR, camera, and encoders for accurate mapping and localization in both simulated and real-world scenarios.
- Developed a complete autonomous navigation system, achieving level-3 autonomy through effective simulation, sensor integration, and visualization.

Hand Gesture Drone

- Designed and developed a hand gesture-controlled drone, integrating sensors to interpret hand movements for flight control.
- Created custom algorithms for gesture recognition, ensuring precise drone responsiveness to specific hand signals.
- Assembled drone components, including motors, sensors, and controllers, ensuring proper integration and functionality for smooth flight operation.
- Conducted performance testing on the drone, analyzing control accuracy and stability during hand gesture inputs.
- Optimized flight stability and responsiveness, fine-tuning the drone’s control system to improve user experience and control precision.

EDUCATION

B.Tech, Production & Industrial Engg.
BIT SINDRI, Dhanbad, India — 2022 - 2026

CORE COMPETENCIES

- Selenium
- PyTorch
- YOLOv8
- opencv
- RViz
- PID Tuning
- Solidworks
- CAD
- JAVASCRIPT
- Motion Planning
- MoveIt
- ROS2
- REDUX
- Fusion 360
- MONGODB

ACHIEVEMENTS

Team leader, Top 19 Finalists, ISRO IROC-U

- Led a team of 10 members to secure a Top 19 placement in a national level competition Organized by ISRO.
- Managed project timelines, task delegations, and team collaboration to meet critical milestones.
- Utilized Robot Operating System (ROS) and Sensor Fusion for reaching autonomy of the rover.

Team leader, Top 100 Finalists, IISF’22

- Developed a device utilizing the mechanical vibrations of the environment generates electrical energy.
- Programmed arduino and used LDR to automate street lights by the energy generated by mechanical vibrations.