Akhil Javvadi

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About Me

I am passionate about building intelligent systems that combine robotics and machine learning to solve real-world problems. My expertise spans autonomous navigation, perception systems, and AI-driven decision-making. I enjoy designing and deploying smart algorithms from robotic control to deep learning models that drive innovation across automation and intelligent systems. With a strong foundation in both practical implementation and research, I thrive on projects that push the boundaries of robotics and AI.

Experience

AI/ML Engineer Intern | *BizFirst LLC* ***Jun 2025 – Present***

- Developing an intelligent AI agent for a no-code website builder using Gemini API to automate content generation and layout decisions.
- Designing and integrating scalable backend APIs with FastAPI to handle real-time interactions and multi-user contexts.

Research Intern | *Titan* ***Aug 2022 – May 2023***

- Built a deep learning model for visual defect detection in analog watches, achieving 92.46% accuracy on real-world samples.
- Enhanced model generalization in low-light and noisy conditions by optimizing preprocessing with OpenCV and TensorFlow.
- Deployed the solution in a live manufacturing setting, reducing defect detection time by over 95%.

Skills

Programming Languages: Python, C++, MATLAB, Embedded C, SQL
Libraries and Tools: OpenCV, ROS2, Gazebo, NumPy, Pandas, TensorFlow, PyTorch, Arduino, Solidworks, Git, Scikit-learn, AWS, Langchain, LangGraph, RAG
Deep Learning & Machine Learning: Transformers, CNNs, Object Detection, LLMs, NLP, Multimodal Learning
Web & Backend Development: FastAPI, Django, Streamlit
Development Platforms: Embedded robotics, Gazebo, SLAM, Path Planning, Data Visualization
Soft Skills: Creative Thinking, Leadership, Interpersonal communication, Workload Management, Problem-Solving Skills

Projects

AI-Powered Doctor Appointment Booking Assistant| *LangChain, Streamlit, FastAPI, SQLite, LLM*

- Built a hospital appointment booking assistant that uses LangChain, local LLMs, and SQLite to extract user input and validate it against a database.
- Created a Streamlit frontend and FastAPI backend to handle chat-based interactions, multi-user support, and step-by-step scheduling.

Adaptive Text-to-Command Translation for Robot Navigation Using T5-small

- Fine-tuned a T5-Small model to convert natural language commands into robot navigation goals, using LoRA to reduce parameters while keeping 98.5% accuracy.
- Deployed the model in a ROS2 and Gazebo setup to control a TurtleBot3 based on user instructions.

Dynamic A and Dijkstra Path-Finding for a Differential Drive Robot*

- Modified A* and Dijkstra algorithms to include robot-specific kinematics like wheel RPM and angular velocity.
- Simulated the robot in Gazebo to test path efficiency and reduce deviation during motion.

Perception-Based TurtleBot Navigation

- Combining YOLO, optical flow, and vanishing point detection to guide a TurtleBot in dynamic settings.
- Tested the system in real environments, reaching an 85% success rate on unfamiliar terrain.

Simulation-Based Autonomous Industrial Robot for Agile Manufacturing

- Built a ROS-based robot for industrial pick-and-place tasks with sensor feedback and fault handling.
- Simulated the complete workflow in Gazebo as part of the ARIAC project team.

Med Nurse (Viropana) | *Fusion 360, Arduino, Sensors, Gazebo, ROS2, C++*

- Designed a robotic nurse assistant for hospital deliveries using ROS2, sensor-based navigation, and obstacle avoidance.
- Simulated delivery paths and interactions in Gazebo to test its reliability and precision.

Education

Master of Engineering – Robotics Aug. 2023 – May 2025
University of Maryland (UMD), College Park, MD
Bachelor of Engineering – Electronics and Communication Engineering Aug. 2019 – May 2023
Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, India