Vishnu Mandala

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Education

University of Maryland, College Park, MD **Jan 2023 – Dec 2024**
Master of Engineering in Robotics GPA: 3.91/4.0
Coursework: Perception and Planning for Robots, Robot Modeling and Controls, AI and Deep Learning, Manufacturing Robotic Systems

Mahatma Gandhi Institute of Technology, India **Jul 2018 – Jul 2022**
Bachelor of Technology in Mechatronics GPA: 7.84/10
Coursework: Kinematics and Dynamics, Robotics and Automation, CAD/CAM, Microprocessors and Microcontrollers, MEMS

Skills

Languages: Python, C++, C, CUDA, Bash
Robotics & Control: ROS1/ROS2 (MoveIt, RViz, Gazebo, URDF, IsaacSim), SLAM, PID, Kalman Filter, Fleet Traffic Management
Automation: Ignition OPC/UA, FT Optix, Nexia, REST APIs, PLC, MQTT, Workflow Design, Acceptance Testing, Commissioning
AI & ML: PyTorch, TensorFlow, YOLO, Reinforcement/Transfer Learning, CNN/RNN, Supervised/Unsupervised Learning
Design & Simulation: SolidWorks, MATLAB/Simulink, ANSYS, Autodesk Inventor, Creo, AutoCAD, 3D Printing
Tools & Platforms: Git, Linux, Docker, CI/CD, Jupyter, CMake, Raspberry Pi, Arduino, NVIDIA Jetson, AWS, VRA, Jira
Sensors & Embedded: LIDAR, Depth Cameras, RGB-D Sensors, IMU, Encoders, Ultrasonic Sensors, PCB Design, Safety Interlocks

Experience

Systems Integration Engineer **Aug 2025 – Present**
OTTO by Rockwell Automation Fort Wayne, IN
- Engineered AMR workflows, fleet maps, intervention logs, and site reports for ∼100 robots across two large-scale plant projects, addressing system design issues, optimizing fleet traffic management, and standardizing deployment documentation
- Integrated AMRs with middleware (Nexia, GM systems) via REST APIs; debugged rosbag and RViz logs, analyzed visualizations, and escalated issues through Jira — improving travel time by 12% and cutting queuing by 20%
- Commissioned deployments by authoring acceptance tests, validating middleware integrations, and building VRA test servers on AWS to trial workflow and system enhancements
- Delivered Tier-3 support and structured training to ∼10 plant employees, combining technical documentation, troubleshooting workflows, and on-site validation to ensure reliable, long-term AMR operations

Robotics Intern **Mar 2025 – Jul 2025**
RoBuildX Inc. Remote
- Developed parametric URDF/XACRO models for the Roofie wall-panel placer, integrating MoveIt2 pipelines and achieving sub-10 mm placement accuracy in Gazebo
- Migrated Gazebo sensor and actuator plugins to ROS2 and built automated test frameworks to validate trajectories and safety interlocks — reducing commissioning time by 30%
- Designed upper-rail gripper controls and payload kits for a 500 kg AMR, fusing LiDAR, IMU, and AprilTag data with Nav2 planners for reliable dynamic navigation

Projects

Agile Robotics for Industrial Automation Competition (ARIAC) | *ROS2, C++, YOLOv8, Gazebo, RViz, UR10e, AGV*
- Managed a 5-member team to develop a NIST-compliant control system for UR10e robots and AGVs in a warehouse, improving kitting and assembly efficiency by 20% through strategic task prioritization
- Developed a YOLOv8-based system for part detection and localization with 98% accuracy, enabling precise conveyor tracking and adaptive handling of faults like missing or defective parts
- Constructed a fault-tolerant ROS2 architecture with real-time monitoring and dynamic tool-changing, enhancing reliability by 15%

Obstacle Recognition and Autonomous Navigation System | *SLAM, YOLOv8, OpenCV, Raspberry Pi, Embedded Control*
- Led a 5-person team to develop an autonomous differential drive robot with real-time pick-and-place, achieving 92% detection accuracy and a 15% YOLOv8 training time reduction using mosaic augmentation and tailored datasets
- Improved navigation precision by 30% with multi-sensor fusion and landmark-based SLAM for real-time trajectory adjustment

RC-NFQ Algorithm for Autonomous Navigation | *PyTorch, Keras, CNN, DQN, Path Planning, Reinforcement Learning*
- Engineered an enhanced RC-NFQ algorithm with dropout-regularized CNNs in PyTorch, reducing collision rates by 15% and training latency by 30%, ensuring robust performance in dynamic traffic and surpassing NFQ/DQN baselines

Improved Bi-directional RRT* for Robot Path Planning | *TurtleBot3, Gazebo, APF, Motion Planning, Sensor Fusion*
- Augmented Bi-Directional RRT* with Artificial Potential Field (APF), reducing path length by 25% and computation time by 30%
- Minimized path inflection points by 50% via APF-based tree growth, sensor fusion, and Dynamic Window Approach, improving real-time path efficiency by 20% in dynamic environments; tested in Gazebo and physical TurtleBot3 Burger

Activities

Vehicle Prototype Developer **FMAE BAJA 2021**
QUADTEK RACING, Mahatma Gandhi Institute of Technology Hyderabad, India
- Designed an off-road prototype vehicle in SolidWorks and ANSYS, reinforcing safety and durability through stress analysis, load distribution, and performance testing, ensuring compliance with FMAE and SAE BAJA standards