

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), SLAM, PID, Kalman Filtering, System Modeling, CARLA

AI & ML: PyTorch, TensorFlow, YOLO, Reinforcement/Transfer Learning, CNN/RNN, Supervised/Unsupervised Learning

CAD & Simulation: SolidWorks, MATLAB/Simulink, ANSYS, Autodesk Inventor, Creo, AutoCAD, 3D Printing

Tools & Platforms: Git, Linux, Docker, CI/CD, Jupyter Notebook, CMake, Raspberry Pi, Arduino IDE, Windows, NVIDIA Jetson

Sensor & Embedded Systems: LIDAR, Depth Cameras, RGB-D Sensors, IMU, Encoders, Ultrasonic Sensors, PCB Design

EXPERIENCE

Robotics Intern

Mar 2025 – Present

RoBuildX Inc.

Remote

- Developed parametric URDF/XACRO models for the Rooftop wall-panel placer, integrated MoveIt2 pipelines, and achieved sub-10 mm placement accuracy in Gazebo simulations
- Ported Gazebo sensor and actuator plugins to ROS2 and built automated test frameworks to validate trajectories, safety interlocks, and refine control parameters — cutting commissioning time by 30%
- Designed an upper-rail-mounted gripper control and payload attachment kit for a purchased 500 kg AMR; integrated CANbus I/O, e-stop circuitry, and HIL tests, then fused LiDAR + IMU + AprilTag data with Nav2 planners for reliable dynamic navigation

Graduate Teaching Assistant

Aug 2023 – Dec 2024

Department of Mechanical Engineering, University of Maryland

College Park, MD

- Delivered hands-on instruction in SolidWorks and Autodesk Inventor to over 600 students, improving design accuracy by 25% through advanced CAD lectures, targeted feedback, and collaboration with faculty on grading and assessments

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
- Designed a multi-threaded Raspberry Pi system for concurrent sensor processing and motor control, ensuring stable 10 FPS obstacle recognition and 25% faster task execution through optimized path planning

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

CERTIFICATIONS

Master Statistics & Machine Learning: Intuition, Math, Code - Udemy

Oct 2024

A Deep Understanding of Deep Learning - Udemy

Oct 2024