DIVYESH RATHOD

623-284-9615 ∘ drathod2@asu.edu ∘ www.divyeshrathod.com ∘ linkedin.com/in/divyesh-rathod/ ∘ github.com/drathod2

EDUCATION

Arizona State University, Tempe, USA **May 2024**
Master of Science, Robotics and Autonomous Systems **GPA: 4/4**
Relevant Courses: *Robotic Systems (Kinematics, Dynamics, Controls), Machine Learning, Mechatronic Systems, Multi-Robot Systems, Embedded Machine Learning, Robotic Systems II (System hardware–software design).*

NMIMS University, Mumbai, India **July 2020**
Bachelor of Technology, Mechatronics Engineering **GPA: 3.25/4**
Relevant Courses: *Industrial Robotics, Flexible Manufacturing Systems, Embedded Systems, Control Systems.*

TECHNICAL SKILLS

Programming Languages: Python, C++, MATLAB, C#, Embedded C, SQL, HTML, PLC Programming, Linux Programming.
Frameworks & Tools: ROS, Gazebo, OpenCV, PyTorch, Tensorflow, Scikit Learn, MQTT, JSON, Git, Docker.
Software: SolidWorks, Simulink, LabView, AutoCAD, UiPath, PowerBI.
Certifications: Machine learning, Image Processing with MATLAB, Deep Learning with MATLAB, Stateflow/Simscape Onramp.

WORK EXPERIENCE

Automation Developer **July 2020 – May 2022**
Aliter Business Solutions Pvt Ltd **Mumbai, India**
- Designed, developed, and deployed 22 software robots for automating business operations on QAD with Python and C#, leading to an 80% reduction in human intervention and a 60% decrease in errors in business data.
- Led a 7-member team to develop and deploy a Python and NLP-powered cloud-based voice/chatbot to control robots on servers, accomplishing 30% improvement in process efficiency.
- Streamlined robot response speed by 50% through REST APIs and MQTT communication with IoT gateways. Collaborated with cross-functional teams to document technical specifications and conducted testing on the production environment.

Mechatronics Intern **May 2019 – June 2019**
Larsen & Toubro **Mumbai, India**
- Programmed PLC and 6 DOF Yaskawa, SCARA robots to build a color-based pick and place system with 95% accuracy.
- Constructed a surveillance and obstacle detection robot using a Raspberry Pi board equipped with a LiDAR sensor.
- Engineered PLC system with sensors and actuators, restructured code for object monitoring, counting, and sorting on a production line, resulting in an 18% reduction in delay time.

ACADEMIC PROJECTS

Advance Motion Planning Algorithms in Complex Environments (Python, C++)
- Implemented RRT, RRT*, Informed RRT* and Probabilistic Roadmap algorithms using sampling methods (Uniform, Random, Gaussian, and Bridge) on campus map for navigation around obstacles.
- Optimized Informed RRT* to achieve 40% shorter paths compared to RRT with advanced heuristics and efficient sampling.

Path Planning Algorithms in Grid-based Environments (Python, C++)
- Implemented algorithms such as BFS, DFS, Dijkstra's, A* and Weighted A* to interpret grid maps and navigate around obstacles.

Predicting Used Car Prices with Machine Learning Algorithms (Python, Scikit-learn, AWS)
- Applied and optimized diverse machine learning models, including linear regression, lasso regression, ridge regression, decision trees, random forest, PCA, and polynomial regression, to predict car prices.
- Conducted comparative analysis of algorithms on local computer, Google Colab, and AWS SageMaker instances, attaining high prediction accuracy with the Random Forest Model with PCA (R Square: 0.98, MAE: 1.5, RMSE: 2.23).

Vision-Based Object Detection and Line Following in UAV (MATLAB, Simulink)
- Innovated low-level flight control algorithm using MATLAB and Simulink for object detection and autonomous drone navigation.
- Incorporated Kalman Filter and Image processing module with edge detection & HSV values to boost navigation by 30% on tracks
- Utilized the Mambo drone's sensors and feedback control for stable hovering with a positional error of under 10 cm.

Autonomous Exploration and Image Recognition using YOLO and Turtlebot3 (ROS, Gazebo, OpenCV, C++)
- Developed an autonomous navigation system for Turtlebot3 in a prebuilt map in GAZEBO, leveraging ROS 2, AprilTag markers, and yolov3 weights, with a remarkable 90% object recognition accuracy and 50% reduced navigation time.
- Integrated YOLOv3-tiny neural network with ROS2 for advanced image recognition. Used OpenCV for filtering & segmentation.

Autonomous Step Climbing Delivery Bot (Solidworks, Embedded C, Labview)
- Designed and analyzed a 3-legged robot in SolidWorks for efficient stair climbing, resulting in a 50% payload increase.
- Built a self-stabilizing platform with servo motors and MPU6050 sensor data, demonstrating 80% reliability on inclined slopes.

CO-CURRICULAR ACTIVITIES

- Organized Robo'Olympics and Robo-golf events for 400+ participants at NMIMS University's technical festival.
- Collaborated with 18 team members from ASU's Biodesign Institute for the Clean Up Drive initiative.