DIVYESH RATHOD

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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, PLC Programming, Linux Programming.
Frameworks & Tools: ROS, Gazebo, OpenCV, PyTorch, Tensorflow, Scikit Learn, MQTT, JSON, Git
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 using Python and C# to automate business operations on QAD, significantly reducing human intervention by 80% and decreasing error in business data by 60%.
- Led a team of 7 members in developing and launching a voice and chatbot using Python and Natural Language Processing to control operational robots on Azure Cloud, leading to a 30% improvement in process efficiency
- Integrated and communicated 28 IoT devices with 22 robots using REST APIs and MQTT to reduce time delay by 75%, while working collaboratively in cross-functional teams to document and deliver solutions.

Mechatronics Intern **May 2019 – June 2019**
Larsen & Toubro *Mumbai, India*
- Built color-based pick and place system using PLC programming for 6 DOF Yaskawa and SCARA robotic arms.
- Developed 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
- Implemented RRT, RRT*, and Probabilistic Roadmap algorithms using sampling methods (Uniform, Random, Gaussian, and Bridge) on campus map for navigation around obstacles.
- Leveraged RRT* algorithm to obtain up to 60% fewer nodes while found paths that were up to 13% shorter compared to RRT.

Path Planning Algorithms in Grid-based Environments
- 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
- Implemented 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, achieving 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
- Innovated an advanced object detection and line follower algorithm using MATLAB and Simulink and executed on Parrot Mambo drone via the access point and Bluetooth.
- Engineered the drone to navigate over predefined tracks through edge detection and calculated HSV values.
- Utilized the drone's built-in sensors and feedback control system to ensure stable hovering when an object was detected.

Autonomous Exploration and Image Recognition using YOLO and Turtlebot3
- Developed an autonomous navigation system for a Turtlebot3 in GAZEBO, integrating ROS 2, AprilTag markers, and yolov3 weights.
- Integrated YOLOv3-tiny neural network and OpenCV with ROS 2 for advanced image recognition and object detection capabilities.

Autonomous Step Climbing Delivery Bot
- Designed and analyzed a SolidWorks-based 3-legged robot for efficient stair climbing, determining its payload capacity.
- Integrated MPU6050 sensor with servo motors for a self-stabilizing platform using accelerometer and gyro sensor data.

CO-CURRICULAR ACTIVITIES

- Organized Robo'Olympics and Robo-golf events for 400+ participants at NMIMS University's technical festival.
- Contributed as a volunteer in ASU's Biodesign Institute Clean Up Drive initiative.