Divyesh Rathod

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EDUCATION

Master of Science in Robotics and Autonomous Systems **Expected May 2024**
Arizona State University (GPA: 4.0/4.0) **Tempe, AZ**
Relevant Coursework: Robotic Systems (Kinematics, Dynamics & Controls), Machine Learning, Mechatronic Systems, Multi-Robot Systems, Embedded Machine Learning, Robotic Systems II (System hardware – software design).

Bachelor of Technology in Mechatronics Engineering **May 2020**
NMIMS University (GPA: 3.25/4) **Mumbai, India**
Relevant Coursework: Industrial Robotics, Flexible Manufacturing Systems, Embedded Systems, Control Systems

TECHNICAL SKILLS

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

PROFESSIONAL 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 deploying a voice and chatbot using **Python** and **Natural Language Processing** to control deployed robots on **Azure Cloud**, leading to **30%** improvement in process efficiency.
- Integrated and communicated IoT devices with robots using **REST APIs** and **MQTT** to reduce delays and enhance connectivity, while working collaboratively in cross-functional teams to document and deliver solutions.

Project Trainee **May 2019 - June 2019**
Larsen and Toubro **Mumbai, India**

- Implemented color-based pick and place operations 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.

OTHER WORK EXPERIENCE

Facility and Space Planning Aide **November 2022 - Present**
Arizona State University, Biodesign Institute **Tempe, AZ**

- Create and maintain a comprehensive database of **21 centers, 30 labs, and 600+ occupants**, ensuring accurate information for efficient space planning, resulting in streamlined operations and optimized resource allocation.
- Collaborate with Center directors, Professors and Project Managers to analyze space requirements, conducted annual space surveys and audits, optimizing space utilization through data analysis, resulting in workflow efficiency, **13 %** cost savings.

ACADEMIC PROJECTS

Predicting Used Car Prices with Machine Learning Algorithms **January 2023 – May 2023**

- Developed and implemented diverse machine learning models, including linear regression, lasso regression, ridge regression, decision trees, random forest, PCA, and polynomial regression, to predict car prices based on 70,063 records with 14 features.
- 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**).

Autonomous Exploration and Image Recognition using YOLO and Turtlebot3 **May 2022 – July 2022**

- Developed an autonomous navigation system for a **Turtlebot3** in **GAZEBO**, integrating **ROS 2**, neural network, and computer vision for image detection and classification using **AprilTag** markers, **yolov3** weights, and darknet ros2 wrapper.
- Leveraged ROS 2 as the communication and middleware layer. Implemented navigation, localization, SLAM-based map building, and coordinate transforms with **TF2** and **quaternions**.
- Integrated **YOLOv3-tiny** neural network and **OpenCV** with ROS 2 for advanced image recognition and object detection, enabling robust filtering, segmentation, and thresholding operations.

Autonomous Step Climbing Delivery Bot **July 2019 - May 2020**

- 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.
- Implemented **RRT*** algorithm on Turtlebot2 using ROS for optimal path planning and navigation towards a predefined goal.

Automated Sorting System **January 2019 - May 2019**

- Engineered PLC system with sensors and actuators, developed code for object monitoring, counting, and sorting on a production line, resulting in an **18%** reduction in delay time.
- Installed IoT-enabled Alarm System, achieving **35%** improved efficiency through timely detection of faulty parts.

LEADERSHIP & INVOLVEMENT

- Organized Robo'Olympics and Robo-golf events for 400+ participants at NMIMS University's technical festival.