NICHOL RODRIGUES, M.S.

Robotics Engineer

+1 (480) 803-7992 • nrodri72@asu.edu • Tempe, AZ • linkedin.com/in/nicholrodrigues

EDUCATION

Master of Science, Robotics and Autonomous Systems; Mechanical and Aerospace Engineering **Jan 2021 – Dec 2022**
Arizona State University, Tempe, AZ 3.8/4 GPA
Relevant Coursework: Control Systems, Robotics System Modeling, Finite Elements for Engineers, Project Management

Bachelor of Engineering, Mechanical Engineering **Jun 2015 – May 2019**
Don Bosco Institute of Technology, Mumbai, India 7.04/10 GPA
Relevant Coursework: Computer-Aided Design and Manufacturing, Mechatronics, Database Management Studies, Thermodynamics

TECHNICAL SKILLS

Mechanical Skills: Control Systems, Robotics System Modeling, 3D Printing, Mechanical Design
Process and Project Skills: Lean Six Sigma, DMAIC, Statistical Process Control, Continuous Improvement
Design, Modeling and Simulation: SOLIDWORKS, CATIA v5, Fusion 360, ROS, Ansys Workbench
Programming: Python, C, C++, MATLAB, R, SQL, Linux Command Line, UIPath, Allen Bradley PLC (RSLogix)
Machine Learning (ML): Tensorflow, Pytorch, Pybullet, Computer Vision (OpenCV)

WORK EXPERIENCE

Shoptaki, Remote: Reinforcement Learning Traffic Control System Developer **Feb 2023 – Jan 2024**

- Spearheaded endeavors to design a reinforcement learning-based autonomous and adaptive traffic control system for any road network to reduce traffic congestion by at least 60% and redirect traffic in case of emergencies.
- Designed and modified functionality based on research through technical documentation to develop an efficient reinforcement learning model for optimal traffic control over a network with 100 intersections.
- Developed code in Python with modules such as pygame, SUMO and OpenStreetMap API to simulate real neighborhoods to visualize and reduce simulated traffic in 4 different kinds of networks.

Arizona State University Financial Aid and Scholarship Services, Tempe, AZ: Webform Design Assistant **May 2022 – Dec 2022**

- Created and corrected templates for creation of webforms on the platform for different departments and academic years throughout the university improving productivity across 4 campuses state-wide.

Embibe, Remote: Content Developer **Apr 2020 – Jun 2020**

- Standardized examination questions from the syllabi of JEE Main and JEE Advanced, thus maintaining quality on an online competitive examination practice platform for students with over 1 million questions.

Stylus Solutions, Mumbai, India: Content Writer **Jul 2019 – Sep 2019**

- Led creative content authoring for systematic guides on using popular computer software to include in a series of primary school computer textbooks for 4 grades.

ENGINEERING PROJECTS

Multi-Agent Reinforcement Learning for Navigation and Exploration **Aug 2022 – Dec 2022**

- Constructed a multi-robot environment in ROS simulated in Gazebo testing for reinforcement learning between 3 agents in an unknown environment for navigation and exploration.
- Studied and analyzed code for simulation in OpenAI Gym and assisted in adapting to implement reinforcement learning algorithms.

Multi Robot Object Transport Using Potential Field and Symmetric Formation Control **Aug 2021 – Dec 2021**

- Led a team of 4 students to devise a method for controlling multiple robot systems to achieve synchronous transport of items.
- Created a framework of operation of collaborative autonomous robots in search and rescue operations.
- Adapted the mathematical model of the multi-robot system for 6 robots in a MATLAB-based simulator ensuring formation control during transport.

Development of Void Fraction Measurement Sensor **Jun 2018 – May 2019**

- Developed a laser-based, non-intrusive measurement device for void fraction in 2-phase flow of air and water.
- Composed the sensor body with SolidWorks to enable 3D printing and assembled lasers to pass through a transparent pipe filled with water and air.
- Assembled and programmed a small-scale Arduino prototype of the sensor to demonstrate the concept to a panel of 8 faculty members.

ACTIVITIES

Sun Devil Robotics Club (SDRC), Mechanical and Software Teams **Aug 2022 – Jan 2023**

- Initiated efforts to interface the ZED 2 camera with ROS2 to establish computer vision for a prototype Martian rover to perform tasks such as object detection as part of the team participating in the University Rover Challenge (URC).

Xanthium Racing **Oct 2015 – Sep 2016**

- Fabricated a quad bike for the national competition "Quad-TORC" in 2016, as a part of the chassis team under 12 experienced seniors, placing the team fourth nationally.