

Nichol Rodrigues, M.S.

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SUMMARY

Robotics and Autonomous Systems graduate engineer with expertise in various fields like data engineering, machine learning, and reinforcement learning. Equipped with a strong foundation in mechanical engineering and has since developed and applied other skills like robotics, programming and data analytics. Adept at problem-solving, learning on the job and teamwork, and seeking to employ this expertise and perspective to brand new learning opportunities in a research role.

TECHNICAL SKILLS

Programming: Python, C, C++, MATLAB, Linux Bash scripting, UIPath, Allen Bradley PLC (RSLogix), HTML/CSS, Javascript, Git
Data Analytics: R, SQL, Tableau, Pandas, Plotly, Data Visualization
Machine Learning (ML): Tensorflow, Pytorch, Computer Vision (OpenCV)
Mechanical Skills: Control Systems, Robotics System Modeling, 3D Printing, Mechanical Design, Finite Element Analysis (FEA)
Process and Project Skills: Lean Six Sigma, DMAIC, Statistical Process Control, Continuous Improvement
Design, Modeling and Simulation: SOLIDWORKS (2D and 3D), Revit, CATIA v5, Fusion 360, Ansys Workbench, ROS, Eagle

EDUCATION

Master of Science, Robotics and Autonomous Systems (Mechanical and Aerospace Engineering) Jan 2021 – Dec 2022
Arizona State University, Tempe, AZ GPA: 3.8/4
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 GPA: 7.04/10
Relevant Coursework: Computer-Aided Design and Manufacturing, Mechatronics, Database Management Studies, Thermodynamics

WORK EXPERIENCE

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

- Spearheaded endeavors to design a reinforcement learning-based automation for a traffic control system for any road network to reduce traffic congestion by at least 60% and redirect traffic in case of emergencies.
- Took ownership of composing and modifying 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 and operated root cause analysis with computer hardware 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.
- Implemented version control and tracking software like Jira to maintain quality of the webforms throughout their creation cycle and between project teams.

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.
- Initiated meetings for onboarding new interns, introducing them to the platform to be used for viewing, correcting, and notation of exam questions in the database.

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.

SUPPLEMENTARY EDUCATION

Google Data Analytics Specialization Aug 2024
Google, Coursera
Skills Obtained/Enhanced: SQL, Tableau, R, Data Visualization, Problem-solving

Lean Six Sigma Certification (White Belt) Apr 2024
The Council for Six Sigma Certification (CSSC)
Skills Obtained/Enhanced: Mechanical Engineering, Statistical Process Control, Continuous Improvement

BIM Fundamentals Apr 2024
National Taiwan University, Coursera
Skills Obtained/Enhanced: Autodesk Revit, Architecture, Civil Engineering, Mechanical Engineering

Robotics: Perception**Apr 2024****University of Pennsylvania, Coursera**

Skills Obtained/Enhanced: Computer Vision, Pose Estimation, Random Sample Consensus, MATLAB

Machine Learning Specialization**Apr 2023****Stanford University/DeepLearning.AI, Coursera**

Relevant Coursework: Applied Machine Learning, Deep Learning, Python, Neural Networks, Tensorflow

PROJECTS AND ACTIVITIES**Kaggle: Fitness Tracker Data Analysis****Aug 2024**

- Conducted data analysis on publicly available dataset containing fitness tracker data from 33 anonymous users collected through Amazon Mechanical Turk.
- Analyzed wellness statistics of these users, like daily calorie usage, daily exercise intensities and duration, daily sedentary time and daily time slept, to deduce the kinds of users of fitness trackers and the activities most logged by them.
- Performed analysis in R through RStudio and used libraries like ggplot and Plotly to visualize each of these statistics, demonstrating the ranges and most likely values of each wellness statistic for the 33 users.

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

- Undertook research into a flexible 2-axis camera fixture to mount a camera on the body of a prototype Martian rover as part of the team participating in the University Rover Challenge (URC).
- Initiated efforts for ZED 2 camera calibration with ROS2 through USB to establish computer vision for the rover to perform tasks such as object detection and navigation.
- In earlier semesters, worked on a teleoperation control system interfacing with a robot framework ROS for a 5-DOF robotic arm.

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.
- Tested and extended functionality to enable independent control of Turtlebot model robots for use in reinforcement learning.
- 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 multi-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.
- Designed the sensor body assembly with CAD tools like SolidWorks and electrical engineering principles like circuit design for lasers to pass through a transparent pipe filled with water and air.
- Assembled and conducted hardware testing for a laser diode array of 22 laser diodes.

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.
- Studied and harnessed various mechanical principles, tools, and materials like welding in manufacturing and testing of mechanical components in a machine shop environment.
- Fortified and serviced the bike as part of the pit crew in the 2-day final off-road racing event, placing the team fourth nationally.