# Rishikesavan Ramesh

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**Summary** — Curious robotics engineer dedicated to bringing imaginative ideas to life, one small innovation at a time.

## Skills

**Robotics** ROS 2, Matlab, SysML, MBSE
**Automation** Ansible, Shell, OCI
**Languages** C++, Python, Typescript
**CI/CD** Earthly, GitOps, CircleCI, Jenkins
**CAD** Onshape, Creo
**Testing** Pytest, GTest, TDD
**Technologies** OpenCV, Git, CMake, Colcon, Bazel
**Web Technologies** WebRTC, React, NodeJS, MongoDB, Sqlite

## Experience

**RobotoAI Technologies** **Jul 2024 – Present**
*Developer - Robotics and Web Systems*

Project: blackman*, a teleop robot

- Designed and implemented a comprehensive end-to-end deployment setup for the blackman* robot.
- Implemented remote logging and forwarding mechanisms.
- Integrated remote debugging capabilities for efficient troubleshooting.
- Analyzed traces to identify bottlenecks and optimize performance
- Automated routine tasks using scripts to reduce manual effort and increase productivity
- Documented system configurations and procedures for knowledge sharing within the team

Project: dymandEdge*, a robot admin dashboard

- Developed and deployed a fullstack web app for mobile robot control.
- Configured monitoring tools to track system performance and troubleshoot issues proactively
- Implemented comprehensive CI/CD pipelines to streamline development and deployment of web systems.
- Established standard DDS configurations for ROS2 in office environments and deployments.
- Analyzed the ROS2 message flow graph to evaluate end-to-end message flow latencies and assessed the busyness of the ROS2 executor for optimal performance.

**KC.IRI** **Jun 2024 – Jul 2024**
*Robotics Software Developer Intern*

Project: greenbot*, a four independent wheel drive robot

- Ported existing software for a four-wheeled mobile robot system to ROS2.
- Implemented the differential drive system using ros2_control for abstracted hardware resource management.
- Revised the Unified Robot Description Format (URDF) for the updated hardware configuration.
- Developed swerve drive kinematics for the robot.
- Configured the Nav2 stack for autonomous navigation.
- Implemented Simultaneous Localization and Mapping (SLAM) for the robot using slam_toolbox.

**RobotoAI Technologies** **Jan 2024 – Jun 2024**
*Intern*

Project: POC App

- Developed a proof of concept for a web application to control mobile robots
- Developed a robust and modular architecture for the web application.
- Creating a full-stack minimal viable prototype deployed on a cloud system for initial testing.
- Implemented password protection for user login in the web application.
- Established a private VPN network for secure communication between robots and the web application backend.

**Forge Innovation and Ventures** **Oct 2022 – Feb 2023**
*Graduate Innovation Engineer Trainee*

Training:

- Awarded a **100% scholarship** for exceptional merit, selected as one of 16 students for the program.
- Gained expertise in design thinking, entrepreneurship, hardware development, industrial automation, robotics, software programming, and rapid prototyping.
- Completed a program focused on innovation-centered engineering, creating a **real-world** solution with Vikra Oceans.

Project: DeepInspect

- Developed a Raspberry Pi-based system utilizing image processing techniques and laser points to enhance depth perception for monitoring and accurately identifying crack sizes in underwater structures using a Pi camera.
- Developed a QT desktop application to aid the system in monitoring process.

**Rane Engine Valve Limited** **Jun 2022**
*Operational Engineer Trainee*

Training

– Gained valuable insights into industrial automation, testing, quality assurance, planning, incentive systems, and workplace culture during my time as an Operational Engineer Trainee, including implementation of 5S methodologies.

## Education

**Dr. Mahalingam College of Engineering and Technology**
**Bachelor of Engineering in Mechatronics*

**CGPA: 9.5/10**

**Coursework Highlights:**

– Completed **6 out of 8 semesters**, focusing on key concepts in mechatronics, automation, and robotics.
– Engaged in hands-on projects that integrated theoretical knowledge with practical applications.
– Developed strong skills in system design, programming, and interdisciplinary collaboration.

## Projects

**SWERVEBOT *(HTTPS://GITHUB.COM/RISHIKESAVANRAMESH/SWERVE-DRIVE)*** **Aug 2024 – Present**

– A ROS2-compatible swerve drive robot designed for enhanced maneuverability and versatility. The core kinematics have been implemented, along with the URDF (Unified Robot Description Format) for accurate representation and simulation. This project aims to integrate advanced control algorithms to optimize performance in dynamic environments.

**BX4PIE *(HTTPS://GITHUB.COM/RISHIKESAVANRAMESH/BX4PIE)*** **Dec 2023 – Feb 2024**

– The BX4Pie project features a custom ergonomic teleoperation controller built with a Raspberry Pi and WaveShare display, designed for affordable and adaptable remote robot control. By integrating ROSLIB.js and ROSBridge server, it enables seamless communication with ROS devices. The open-source initiative promotes collaboration within the robotics community, while extensive testing ensures reliability and precision. With its innovative design, the project aims to make advanced robotics accessible to enthusiasts and professionals alike, fostering experimentation and innovation.

## Certificates

**Managed In Context Design** **Issued: Nov 2023**
*Onshape, a PTC Business*

– Developed skills in managing complex design projects and collaborating effectively in team environments.
– Gained proficiency in utilizing Onshape's tools for efficient design iteration and feedback.

**Master Model** **Issued: Nov 2023**
*Onshape, a PTC Business*

– Mastered the creation and management of multi-part assemblies using Onshape's advanced features.
– Enhanced understanding of best practices for scalable and maintainable design workflows.

**Simultaneous Sheet Metal** **Issued: Jul 2023**
*Onshape, a PTC Business*

– Learned to create and modify sheet metal parts efficiently within the Onshape environment.
– Developed skills in generating flat patterns for manufacturing and fabrication.

**FeatureScript Fundamentals** **Issued: Jul 2023**
*Onshape, a PTC Business*

– Acquired foundational knowledge of FeatureScript for custom feature creation in Onshape.
– Gained experience in scripting to automate repetitive design tasks.

**MBSE: Model-Based Systems Engineering** **Issued: Jul 2023**
*University of Buffalo*

– Learned principles of Model-Based Systems Engineering and its application in project development.
– Developed skills in creating and managing system models to improve project outcomes.

**Unix Systems Basics** **Issued: Jun 2023**
*Codio*

– Acquired a solid understanding of Unix operating systems, emphasizing command line proficiency and shell scripting.
– Developed skills in file system management, including permissions, processes, and automation tasks.