Gokhul Raj Ravikumar

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Aspiring Robotics Engineer with a comprehensive foundation in mechanical engineering, programming, automation, and control systems. Proven ability to analyze and optimize robotic systems to support company objectives. Adept at fostering cross-departmental collaboration for successful project outcomes and driving efficiency improvements through strategic problem-solving and innovation. Dedicated to leveraging the latest technologies to advance automation capabilities and enhance operational performance.

EDUCATION

Hochschule Schmalkalden, Germany   Present
Masters in Mechatronics and Robotics | GPA: 2,6
Concentration: Control design, Operating system, Hardware Testing
Courses: Rapid Control Prototyping | Sensor Systems | Development of Mechatronic Systems | Robotic Vision

Anna University, India   Aug 2021
Bachelors in Mechanical Engineering | GPA: 1,9
Courses: Machine Design | Finite Element Analysis | Engineering CAD | Transmission Systems | Machine Learning
Honors: Elected as Secretary for Innovation Club and Teaching Assistant for Advanced Robotics application's Course

TECHNICAL SKILLS

Robotics Frameworks and Tools: ROS, ROS2, URDF, Xacro, Nav2, SLAM, MoveIt2, Rviz2, Lidar, Gazebo, Ignition Gazebo, AMCL, Particle Filter, Simple Commander API, Pure Pursuit, ROSLIB

Programming Languages and Libraries: C++, Python, HTML, CSS, JavaScript, React

Development and Deployment: Docker Containerization, Docker Compose, CI/CD, Jenkins, Git, GitHub

Other: Tableau, P-controller, PID controller, Computer Vision, OpenCV, GUI

EXPERIENCE

Shree Enterprises, India   Oct 2021 – Apr 2022
Graduate Engineer Intern

- Installed, commissioned, and programmed a fully automated robotic welding system with Panasonic MIG welding robots and a Yaskawa pick-and-place robot, integrating PLC and HMI for seamless operation.
- Developed and implemented custom pneumatic and magnetic end-effectors for precise handling and welding operations, optimizing cycle time from 1 minute 30 seconds to 40 seconds per beam.
- Conducted comprehensive troubleshooting of sensor data and PLC programming errors, ensuring safety protocols with LIDAR sensors to automatically halt operations during manual interventions.

PROJECTS

The Construct – Robotics Developer Masterclass Program   March 2024 - Present
RB1 Robot Warehouse Navigation Project

- Developed a Python script utilizing the Simple Commander API to orchestrate navigation tasks for the RB1 mobile robot, including localization, shelf manipulation, and waypoint navigation.
- Implemented a Costmap Filter to generate a Keepout Mask, employing navigation algorithms and path planning techniques to enhance the robot's safe navigation in complex environments by avoiding predefined obstacle areas.
- Integrated the Costmap Filter into the navigation stack by configuring navigation launch files, planner settings, and controller parameters.

UR3e Pick and Place Project Using Perception

- Developed a Perception node using ROS2 to detect the position of a cube on a table using point cloud data from the UR3e robot's wrist camera.
- Created a C++ client program to communicate with the Perception action server and retrieve object coordinates, enabling the robot to autonomously pick and place objects based on real-time perception data.

Web Development Project for Robotics

- Developed a web application to control the TortoiseBot robot, leveraging HTML, CSS, JavaScript (Vue.js), and ROSLIB for web development and ROS integration.
- Integrated features including map visualization, 3D robot model display, live camera feed, virtual joystick for manual control, and waypoint buttons for navigation.
- Designed an intuitive and user-friendly interface for robot control and provided real-time visualisation of mapping progress, robot model, and camera feed.

CERTIFICATES

Modern Robotics: Foundations of Robot Motion
Northwestern University, Coursera

Python Data Structures
University of Michigan, Coursera

Introduction to Self – Driving Cars
The University of Toronto, Coursera

MATHLAB & Simulink Onramp
MathWorks

PUBLICATIONS

Dual Side double-acting reciprocating Pump using Scotch yoke mechanism   Dec 2020
AIP Conference Proceedings Indexed in Scopus
Have independently conducted research resulting in a successful publication on design optimization
Research Article

LANGUAGES

- English [Advanced]
- German [Limited working proficiency]