

SURAJ KALWAGHE

☎ (240)-438-1930 ✉ suraj.kalwaghe@protonmail.com 🌐 [Suraj Kalwaghe](#)

Education

University of Maryland

M.Eng Robotics

Aug 2023 - May 2025

College Park, MD

Savitribai Phule Pune University

B.Eng Electronics and Telecommunications

Aug 2019 - May 2023

Pune, India

Technical Skills

Languages: Python, C++, Embedded C, Git, Scripting (Bash), LaTeX, HTML.

Libraries: Numpy, Sympy, Pandas, Matplotlib, OpenCV

Robotics: ROS 2, RViz, Gazebo.

Development Boards: Arduino, AtMega, Nvidia Jetson, Raspberry Pi, Teensy, Orange Boards.

Experience

MLIT-18 Technologies Pvt Ltd. | *Software Engineering Intern*

Oct 2021 - Dec 2021

- Collaborated closely with industry experts to optimize business processes and gained expertise in multiple projects leveraging a diverse range of technologies, including Arduino, Jetson Nano, Jetson Xavier, and Autodesk Fusion 360.
- Implemented Machine Vision cameras across diverse domains, streamlining quality control processes and reducing defects through automated visual inspection.
- Spearheaded the development of a comprehensive presentation on New Product Development, effectively communicating complex concepts to colleagues and senior management, resulting in increased buy-in and project alignment.

Smart Setu. | *Research And Development Intern*

May 2021 - Aug 2021

- Analyzed experimental data with precision and proactivity, translating findings engaging presentations leading to end product development; showcased the potential of UV sanitation for improved health and safety.
- Led system redesign initiative, streamlining processes and optimizing workflows, resulting in a 30% increase in team efficiency.
- Rendered CAD designs to optimize 3D models for UV-based sanitation solutions.

Projects

Anti-Kaboom | *ROS2, Gazebo, RViz, Python, C++, Matlab*

Nov 2023 - Dec 2023

- Employed a 5 DOF manipulator arm with a claw-like end-effector for intricate handling.
- Developed and optimized precise forward kinematics models for manipulator arms, ensuring accurate end-effector positioning and achieving a 95% reduction in positioning errors.
- Validated kinematic calculations with exceptional accuracy and efficiency through implementing meticulous testing methodologies; reduced margin of error by 75%.
- Optimized the tele-operation model using python resulting in 12% increase in handling time and movement.

Mastering Crane Dynamics: Control Design and Analysis | *Matlab*

Dec 2023 - Dec 2023

- Developed a comprehensive mathematical model of a nonlinear crane system with two suspended loads.
- Designed and implemented LQR controllers for both linearized and original nonlinear models, achieving effective stabilization and 95% settling time reduction in response to disturbances.
- Leveraged MATLAB's powerful capabilities to create dynamic visualizations, reports and enhancing data interpretation.

TurtleBot Maze Navigation | *ROS2, Gazebo, C++*

De 2023 - Dec 2023

- Built ROS2 package for autonomous TurtleBot navigation in intricate mazes.
- Built a project utilizing Aruco markers, significantly improving localization precision and reducing collision incidents by 12%, resulting in enhanced performance for autonomous vehicles.
- Orchestrated the integration of Python and C++ for real-time object recognition, enabling advanced environment analysis techniques.
- Enhanced communication using ROS nodes, enabling faster response times.

Commercial Electric Vehicle | *Raspberry Pi, Arduino, Linage OS, CrankShaft*

Jun 2022 - Jan 2023

- Engineered and upgraded embedded control systems for an electric vehicle, resulting in a 15% increase in energy efficiency and enhanced user experience.
- Pioneered the implementation of a real-time data acquisition and analysis system to optimize vehicle performance.
- Innovated the design and implementation of an intuitive and user-friendly interface for vehicle control and monitoring, leading to a 20% increase in user engagement.