

Sushmitha Govindaraj

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SUMMARY

Results-driven Robotics Engineer with expertise in AI-powered solutions, autonomous systems, and industrial automation. Proven experience in developing intelligent systems with focus on deep learning, reinforcement learning, robotic manipulation, and sensor data fusion. Demonstrated ability to enhance autonomy, adaptability, and efficiency in robotics through advanced AI technologies. Passionate about shaping the future of human-machine interaction and advancing intelligent automation for industrial applications.

EDUCATION

TU Dortmund

M.Sc. in Automation & Robotics

Dortmund, Germany

Oct 2022 – Present

PSG College of Technology

B.E. in Robotics & Automation

Coimbatore, India

2018 – 2022

SKILLS

AI & Machine Learning: Deep Learning, Reinforcement Learning, Computer Vision, PyTorch, TensorFlow

Programming: Python, C++, MATLAB

Robotics: ROS1, ROS2, SLAM, Sensor Fusion, Autonomous Navigation

Automation & Control: PLC Programming,

SCADA, Robot Integration, Vision Systems

Embedded Systems: Microstrip Design, SI/PI, Sensor Data Fusion

Software & Tools: Gazebo, OpenCV, SolidWorks, SPICE Simulations

Languages: English (Fluent), German (B2 – Learning)

EXPERIENCE

Master Thesis Student

TU Dortmund

Nov 2024 – June 2025

Dortmund, Germany

- Conducted research on sonar-based SLAM for GNSS-free localization of autonomous vessels in environments.
- Developed a localization system using IMU, DVL, and sonar sensors in ROS2 and frameworks.
- Designed an LSTM neural network model to improve odometry accuracy in underwater with conditions.
- Implemented Extended Kalman Filter algorithms for real-time positioning in autonomous navigation.
- Validated system performance in Gazebo with visualization, detailed error heatmaps, and analysis.

Research Assistant

TU Dortmund

June 2024 – May 2025

Dortmund, Germany

- Worked at Information Processing Lab, Department of Electrical Engineering and Information Technology.
- Optimized signal processing in embedded systems through AI-driven modeling and advanced algorithms.
- Applied machine learning techniques to enhance circuit performance and improve signal integrity analysis.
- Developed Python tools for model training, data preprocessing, and automated evaluation frameworks.

Project Intern

AAteK Robo Private Limited

Dec 2021 – May 2022

Coimbatore, India

- Developed robotic automation system for RTPCR sample collection and processing to minimize intervention.
- Utilized Python and ROS framework for robot control and implemented computer vision algorithms for detection.
- Enhanced laboratory automation through intelligent control systems and adaptive mechanisms for handling.

PROJECTS

AI-Based SI/PI-Compliant PCB Design

Oct 2023 – June 2024

- Developed AI-based models to optimize high-speed PCB designs for signal integrity with generation.
- Created comprehensive training datasets using SPICE simulations and Zuken eCADSTAR with analysis.
- Integrated AI-driven recommendations to enhance PCB design reliability and performance with optimization.

Robotic Arm on Omnidirectional Base

Dec 2021 – May 2022

- Developed a 5-axis robotic arm mounted on a Mecanum-wheeled omnidirectional base with control.
- Created control algorithms for precise pick-and-place operations in dynamic environments with avoidance.
- Integrated flexible mobility solutions enabling adaptive handling in various workspaces with navigation.