SARATH KUMAR SENTHILKUMAR KAVITHA

Robotics Engineer

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Career Objective

Engineer specialising in robotics, automation, IoT and artificial intelligence, with advanced programming expertise in Python, C++, and ROS. Demonstrated success in developing and optimising robotic systems and integrating AI solutions and contributing to innovative automation projects. Committed to leveraging technical knowledge to enhance efficiency and precision in innovative automation projects within a professional robotics engineering role.

Education

The University of Manchester **September 2025 - Present**
Robotics Master of Science

Vellore Institute of Technology, Chennai **September 2021 - July 2025**
Computer Science Engineering Specialization In Artificial Intelligence and Robotics Bachelor of Technology
CGPA: 9.07

Experience

Vellore Institute of Technology Contractual Project – Bimental Pvt. Ltd. **January 2025 - August 2025**
Robotics Engineer Intern Chennai, India

- Developed an automated fault detection system using OpenCV and machine learning algorithms, identifying surface defects in real time on Nvidia Jetson Xavier, achieving an accuracy rate of 85%.
- Devised image preprocessing, feature extraction, and classification models that enhanced detection accuracy and precision by 89%, contributing to a research project presented at an international conference.
- Collaborated with 3 cross-domain teams to integrate the solution into existing industrial inspection workflows.

Mafkin Robotics **June 2024 - August 2024**
ROS2 Programming Intern

- Engineered and programmed movement and localization systems for an autonomous ship-cleaning robot using ROS2.
- Integrated Camera, Encoders, and IMU sensors for real-time navigation, mapping, and obstacle avoidance.
- Designed control algorithms to achieve high-precision localization and smooth motion control.

Tata Consultancy Services **August 2023 - November 2023**
RPA Developer Intern Chennai

- Developed and implemented 15 automated workflows for business processes using UiPath, enhancing operational efficiency.
- Collaborated with cross-functional teams to ensure seamless integration and deployment of RPA solutions.

Skills

Programming Languages: Python, JavaScript, C, C++, Java, SQL

Frontend Technologies: ReactJS, HTML, CSS, Bootstrap

Tools & Frameworks: UiPath RPA, ROS1, ROS2, Gazebo, RViz, Arduino, Raspberry Pi, Nvidia Jetson, Firebase

Technologies & Domains: Machine Learning, Computer Vision, NLP, IoT, Embedded Systems

Projects

Robotic Automation for Fault Detection in Metal Sheets **August 2025**

- Prepared an advanced fault detection framework utilising machine vision and deep learning, achieving an 89% accuracy rate in identifying cracks and surface defects in metal sheets.
- Applied OpenCV, TensorFlow, and YOLO-based models for real-time defect detection with high accuracy.
- Incorporated the system with an NVIDIA Jetson Xavier for on-device processing, enhancing defect identification efficiency by 40% and a robotic spray mechanism to automatically mark defective areas with ink.

Nuclear Environment Automation System **December 2024**

- Designed an autonomous robotic system for nuclear environment automation using vSLAM for real-time mapping and localization.
- Conducted simulation testing in Gazebo, validating navigation accuracy, sensor performance, and robotic arm operations in hazardous environments.
- Embedded depth camera sensors for object detection and environment perception, with a robotic arm attached for autonomous task execution.

Agri-Connect Smart Irrigation System **August 2023**

- Implemented a smart irrigation system using Raspberry Pi with integrated IoT functionality for remote monitoring and control.
- Deployed soil moisture, rainfall, humidity, and temperature sensors, along with weather forecast data, to optimize irrigation schedules.
- Formulated automation algorithms to control water flow and schedule irrigation based on real-time environmental data. Enabled remote access and monitoring via a user-friendly interface, improving water efficiency and crop management.

Voice-Controlled Home Automation System **May 2022**

- Built a voice-controlled home automation system using Raspberry Pi. Incorporated IoT protocols(MQTT/HTTP) and speech recognition modules to enable seamless voice-based device control.
- Implemented real-time device status monitoring and notifications to ensure efficient system performance and user awareness.
- Created a user-friendly interface for managing smart appliances, enhancing accessibility and convenience.

E-learn Website
Developed an E-learning platform that won the overall first prize in the CSI Product Development Hackathon. The platform features videos for all classes, quizzes for each video, and whiteboard and material support in regional languages. The project was developed using ReactJS, ExpressJS, and MongoDB.

3-DOF Robotic Arm
Developed a ROS-based IoT-controlled robotic arm with a 3-DOF manipulator mounted on a wheeled mobile base, integrating Raspberry Pi for processing and Python for control, enabling autonomous and remote operation.

Certifications

IOT-Foundations Course Completion **May 2019**
SP Robotics Maker Lab

RPA Developer Foundation **October 2023**
UiPath

Google Cloud Computing Foundation **November 2023**
NPTEL

Enterprise Automation Certificate **June 2023**
Workato

Face Recognition Application
GUVI Geek Networks, IITM Research Park

Developed Face Recognition Application using python

Awards & Achievements

- **1st Place – CSI One-Day Product Development Hackathon ’23**
  Computer Society of India | February 2023
  Secured overall 1st prize for developing an online education system using HTML, CSS, JavaScript, and Django.
- **Stage 3 Finalist – e-Yantra Robotics Competition ’24**
  Indian Institute of Technology Bombay | June 2024
  Advanced to Stage 3 as one of the top 100 teams; designed and implemented autonomous path-planning algorithms for a Geo-Guide robotic system.