

# Viren Sompura

Robotic Engineer

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## OBJECTIVE

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Seeking a challenging position as a ROS Engineer or Robotics Software Engineer where I can leverage my expertise in ROS/ROS2, robotics systems, and software development to contribute to innovative robotics solutions.

## KEY SKILLS

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- ROS/ROS2 Framework, Autonomous Navigation, SLAM, Sensor Integration, Gazebo
- RS-485 Communication, MicroROS, FreeRTOS, RTAB, ORB-SLAM
- Robot Hardware-Software Integration, Python, C++, Version Control (Git)
- API Integration, Stream lit, Flask Framework
- CAD, Blender, URDF
- Linux Systems, Embedded Systems Programming

## EDUCATION

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<b>M.S. Ramaiah University of Applied Science</b> <i>M.Tech. in Robotics Engineering</i>	2021 – 2023 CGPA: 9.0
<b>Sal College of Engineering</b> <i>B.Tech. in Mechatronics Engineering</i>	2016 – 2020 CGPA: 8.02

## PROFESSIONAL EXPERIENCE

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<b>Vama Communications Pvt. Ltd.</b> <i>Robotic Engineer</i>	Sept 2023 – Present <i>Ahmedabad, Gujarat</i>
<ul style="list-style-type: none"><li>• Spearheading the development of Curio Robot's hardware and software in the R&amp;D department</li><li>• Designed and implemented custom PCB solutions for enhanced robot functionality</li><li>• Currently implementing ROS2-based navigation and SLAM on Jetson Nano, improving robot autonomy by 40%</li><li>• Developed software modules that reduced system latency by 25% and increased overall robot efficiency</li></ul>	
<b>Fenwick and Ravi (F.A.R.)</b> <i>Intern</i>	April 2023 – July 2023 <i>Bangalore, Karnataka</i>
<ul style="list-style-type: none"><li>• Developed software for a radio-shuttle system, improving warehouse automation efficiency by 30%</li><li>• Created an Autonomous Mobile Robot using ROS2 Framework, implementing custom navigation algorithms</li></ul>	
<b>Raicam Automotive Private Limited</b> <i>Trainee Engineer</i>	September 2020 – March 2021 <i>Sanand, Ahmedabad</i>
<ul style="list-style-type: none"><li>• Contributed to the production of Clutch Actuation systems, focusing on Clutch Master Cylinder and Concentric Slave Cylinder development</li><li>• Implemented process improvements that increased production efficiency by 15%</li></ul>	

## ROBOTICS PROJECTS

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### Curio: Museum Guidance Robot

🎥 [Video](#) 📁 [Project](#)

- We developed a Guidance Wheel Robot named "CURIO" for guidance at Kolkata Museum, which is using Atmega2560 IC
- User can interact with robot and can ask any science and technology related questions and robot can explain every exhibit of the museum

### Humanoid Robot

🎥 [Video](#) 📁 [Project](#)

- Along with "CURIO", we also developed a Humanoid Robot that greet and talks to everyone
- Used various sensors which sense the movement of the crowd and greets the visitor of museum

## Autonomous Mobile Robot with LiDAR & A\* Search Algorithm

[GitHub](#) [Project](#)

- Developed an AMR prototype using Raspberry Pi 4 for ROS integration and Arduino Mega for low-level hardware control
- Implemented real-time obstacle mapping and navigation using RPLiDAR A1M8 and A\* search algorithm

## ROS2 Robot Development and Testing

[Project](#)

- **ORB-SLAM3 Integration:** Integrated ORB-SLAM3 with ROS2 and Nav2 for real-time visual SLAM and precise localization
- **RTAB-Map Mapping:** Implemented RTAB-Map for 3D mapping and loop-closure detection on a mobile robotic platform
- **Autonomous Docking:** Developed an auto-docking solution using a static `docking_station` TF frame and `NavigateToPose`
- **Web Control Interface:** Built a web-based interface for remote robot control and monitoring via ROS2 topics and services
- **RS-485 Communication Driver:** Engineered an RS-485 protocol interface for DDSM115 motors, enabling multi-channel communication and synchronized motor control
- **micro-ROS Hardware Integration:** Deployed micro-ROS on embedded MCUs to orchestrate wheel encoders, LEDs, INA219 power sensors, and stepper motors within the ROS2 ecosystem
- **FreeRTOS Real-Time Framework:** Implemented FreeRTOS task scheduling and inter-task communication to guarantee deterministic sensor sampling and smooth actuator performance
- **System Performance Optimization:** Performed real-time profiling and firmware optimizations to reduce control-loop jitter below 5 ms and enhance resource efficiency

## ROS2 Sensor Integration and Driver Development

[GitHub](#) [Project](#)

- Developed and implemented custom ROS2 drivers for advanced sensors, including Qwiic ICM20948 IMU and VL53L0X ToF distance sensor
- Engineered a robust sensor fusion algorithm, significantly enhancing the accuracy and reliability of robot localization and obstacle detection

## Automatic Cocoon Sorting Machine

[GitHub](#) [Project](#)

- Designed and built a low-cost prototype for sorting male and female cocoons based on weight
- Achieved a sorting rate of 600 cocoons per hour, improving efficiency in silk production

## Smart Jacket for Visually Impaired People

[Project](#)

- Created a wearable assistive device using Arduino Mega, ultrasonic sensors, and vibrating motors
- Implemented obstacle detection and distance-based feedback system

## TECHNICAL SKILLS

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- ROS/ROS2 Framework, Navigation Stack, SLAM, Linux, Docker, Git, FreeRTOS, ORB-SLAM, RTAB, RS-485 Communication, MicroROS
- Python, C++, Arduino, Machine Learning and Computer Vision basics, Flask basics, API integration, Streamlit
- Microcontrollers: Arduino, NodeMCU (ESP8266), ESP32
- Single-board computers: Raspberry Pi 4, Jetson Nano
- CAD: SOLIDWORKS, CATIA V5R20, AUTOCAD 2D
- Simulation: Gazebo, Rviz, MSADAMS (introductory), ANSYS (introductory), HYPERMESH (introductory)
- Other: MATLAB and Simulink (beginner), Automation Studio

## CERTIFICATIONS AND ADDITIONAL ACTIVITIES

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- NPTEL course: "Introduction to Machine Learning" - IIT Madras (November 2022)
- Participated in "Arduino with MATLAB workshop" - GANPAT University
- Volunteered for "MATHO" workshop at Sal College of Engineering