Sahana Krishnamurthy

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Professional Summary

Robotic Engineer with over 3 years of experience in autonomous systems, computer vision, and AI/ML-based robotic control. Proficient in ROS/ROS2, Gazebo, SLAM, YOLOv8, and Sensor Fusion, with a proven track record of enhancing navigation autonomy, reducing error rates, and developing scalable robotic solutions for industrial automation. Known for structured problem-solving, innovation in robotic perception, and interdisciplinary collaboration across software, hardware, and cybersecurity environments.

Technical Skills

- **Languages & Libraries:** Python (NumPy, Pandas, SciPy, Matplotlib, OpenCV), C, C++, Embedded C, Shell (Bash), SQL, JSON.
- **Tools & Platforms:** ROS/ROS2, Gazebo, Franka Emika Panda, Dynamixel-X, OpenManipulator, Autonomous Mobile Robots (AMR), RViz, MoveIt, YOLOv8, PyTorch, TensorFlow, AUTOSAR, SILVER Framework, MQTT, LiDAR, Camera, GPS, Rational DOORS, Docker, Git, GitHub, CMake, PCL, IBM WebSphere, Oracle WebLogic, JBoss, IIS, VMware vSphere, Active Directory, LDAP, ServiceNow.
- **Expertise:** SLAM & Sensor Fusion, Path Planning (Dijkstra), Localization (Particle Filter, ICP), Computer Vision, AI & ML for Robotics, Automation Testing, Embedded Systems Security, Digital Twin Simulation, Cybersecurity Compliance (ISO 21434 / NIS2), Applied Mathematics (Linear Algebra, Probability, Statistics, Optimization), Statistical Methods, Windows/Linux Administration, Technical Documentation.
- **Core Competencies:** Analytical Thinking, Systematic Problem-Solving, Agile Methodology, Time Management, Project Management, Cross-Cultural Communication, Proactive Initiative, Creative Innovation, Decision-Making, Adaptability & Flexibility.

Professional Experience

Master Thesis [Grade-1.7/5 gpa]
Institute of Automation Technology and Software Systems, Germany **Jun 2024 – Nov 2024**

- **Developed and deployed SLAM-based autonomous navigation** using ROS2, Gazebo, and TurtleBot3, reducing obstacle collisions by 40% in dynamic factory environments.
- **Designed multi-sensor fusion architecture** combining LiDAR, RGB cameras, GPS, and radar, achieving 95% localization precision on robot navigation.
- **Trained and optimized YOLOv8 deep-learning models** for object detection and robotic manipulation, reaching 92% accuracy with 15 FPS real-time performance.
- **Integrated MQTT-based IoT protocols** for inter-robot communication and factory coordination, reducing manual coordination by 60% and increasing operational scalability.
- **Applied model quantization and edge optimization techniques** to achieve 35% inference latency reduction while deploying on embedded industrial devices.

Working Student – Cybersecurity Consultant
Itemis AG, Germany **Jun 2023 – May 2024**

- **Conducted cybersecurity compliance analysis** under ISO/SAE 21434, ISO 26262, and NIS2, identifying 30+ vulnerabilities across automotive software modules.
- **Performed TARA** (Threat Analysis and Risk Assessment) using Itemis SECURE, improving traceability from 65% to 92% via Rational DOORS.
- **Executed penetration testing and risk-mitigation strategies,** boosting system robustness by 40% against automotive cybersecurity threats.
- **Managed requirement engineering documentation** for OEM and Tier-1 cybersecurity audits, ensuring alignment between security and functional safety requirements.

Working Student – Automation Testing Engineer
Bosch Engineering GmbH, Stuttgart **Feb 2022 – Sep 2022**

- **Automated 200+ test cases** in C++ and Python using SILVER simulation framework, reducing testing time by 45%.
- **Designed AUTOSAR-compliant models** for sensor fusion and autonomous driving validation, reducing hardware dependency and increasing test coverage.
- **Conducted failure analysis and test validation** against ISO 26262 safety standards, ensuring alignment with automotive functional safety requirements.
- **Collaborated with system engineers** on optimizing test-automation pipelines, improving overall reliability and maintainability for development teams.

IT Consultant – Assistant System Administrator
Tata Consultancy Services, India **Jul 2019 – Aug 2021**

- **Managed 250+ enterprise middleware servers:** WebSphere, WebLogic, JBoss, IIS, while maintaining 99.9% system uptime and service availability to more than 10,000 concurrent users.
- **Automated SSL Certificate Renewal and disaster recovery** using Bash and Python scripts, reducing downtime incidents due to security by 55%.
- **Designed CI/CD automation pipelines** in Azure: reduced software release cycle time by 40% and decreased errors from deployments by 60%.
- **Strengthened cybersecurity monitoring and incident response workflows,** reducing mean-time-to-resolution by 50% with proactive automation.
- **Received multiple TCS Performance Awards** for excellence in system stability and customer satisfaction (2020 and 2021); provided 20+ production servers live within 1 week, Nov 2020.

Education

Masters in Electrical Engineering, **Universität Stuttgart** **Oct 2021 – Nov 2024**
Coursework: Algorithms, Data Structures, Software Engineering, Robotics, DL/ML, AI, Control Systems, Pattern Recognition, MRI Lab, Smart Systems, Embedded Systems.

B.E. in Electronics & Communication, **Visvesvaraya Technological University** **Jul 2015 – Jun 2019**
Coursework: Embedded Systems, Computer Engineering Fundamentals, Software Development, Signal Processing, Mathematics, Verilog.

Projects

Research Project — Universität Stuttgart, Germany **May 2023 – Oct 2023**
Identification of Failure Modes in Robotic Systems

Designed an LLM-based failure detection framework for Franka Emika Panda robot; improved diagnostic accuracy by 92% and reduced recovery time by 40%. Built knowledge graphs for predictive maintenance, reducing unexpected downtime by 60% and enhancing system robustness.

Mini Project — Universität Stuttgart, Germany **Nov 2023 – Feb 2024**
Digital Twin for Condition Monitoring of Mobile Robot

Built a ROS2 digital twin in Gazebo for real-time condition monitoring (95% accuracy). Implemented Python anomaly detection nodes (88% precision), reducing system downtime by 45%.

Certifications

Modern Robotics: Mechanics, Planning, and Control (Northwestern University, Coursera Specialization) **Apr 2024**
Advanced Computer Vision with TensorFlow (Coursera) **Jul 2024**

Languages

English C1 (Proficient)
German B1 (Intermediate)