

# Vinay Bommanahalli Umesha

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## EDUCATION

### M.Eng Electrical Engineering and Embedded Systems

02/2022 -2024

*Hochschule Ravensburg-Weingarten University of Applied Sciences, Germany*

- Key courses: Lidar and Radar System on Chip, Advanced Signal Processing, Embedded Computing, Advanced Control Systems, Autonomous Driving, OpenCV

### Bachelor of Technology in Electrical Engineering

07/2018 - 04/2022

*Gandhi Institute of Technology and Management (GITAM), India*

- Specialization: Robotics, Automation, IoT, and Embedded Systems

## TECHNICAL SKILLS

**Programming Languages:** Python, C++, MATLAB, CAPL, PCB Design-KiCAD

**Tools & Frameworks:** Robot Framework, CANoe, OpenCV, Rest-API, Postman, ET-Framework, PuTTY, WinSCP, On/Off-board Diagnostic Tools, Ki-Cad

**Software Development:** Git, GitHub, GitLab, AUTOSAR

**CI/CD & DevOps:** GitLab CI, Jenkins, Docker

**Hardware:** Microcontrollers, Radar, Lidar, FPGAs

**Operating Systems:** Windows, Linux

**Methodologies:** Agile (Scrum, Kanban), V-Model

**Collaboration & Monitoring:** Jira, Confluence, Grafana

## EXPERIENCE

### Software Test Engineer

02/2024 - 01/2025

*Mbition (Mercedes-Benz Innovation Lab), Berlin, Germany*

- Supported developers in software-based issue reproduction and troubleshooting, including VCPU simulation, Ethernet firmware debugging, QNX, and RichOS flashing.
- Simulated the core of vehicle function applications entirely in software on the newest Civic architecture.
- Developed automated test scripts using CAPL and XML scripting for software testing workflows.
- Analyzed Ethernet and DLT traces through software tools to ensure performance and reliability.
- Developed a software-based test framework to measure KPIs for the Rear View Camera (RVC).
- Conducted software testing of core vehicle modules using DOIP and other Ethernet logging interfaces.
- Tested core vehicle functionalities and infotainment, including Air Conditioning, Multifunctional Seats, RVC, and Assistant Settings, Safe-Mode entirely within software environments.
- Created software testing scripts, and documentation, and handled ticketing and verification processes in a software-controlled setup.
- Performed software-driven feature testing, verification, regression, and exploratory testing to ensure system integrity and reliability.
- Worked in a **Linux-based test environment** to verify feature/backend services for proper integration and stability.

### Test Automation Engineer

07/2023 - 01/2024

*MBition (Mercedes-Benz Innovation Lab), Berlin, Germany*

- Handled system integration, rebasing, and merging requests using **GitLab** and **Git**, improving collaboration and maintaining version control hygiene.
- Contributed to the development of automated backend flashing onto test environments aligned with daily release and production software updates using **Jenkins-based CI/CD pipelines**.
- Performed test planning, monitoring, analysis, execution, and status reporting for software testing processes.
- Conducted UDS Diagnostics Testing using **Vector Monaco Tool** to evaluate and validate software functionalities.

- Executed manual and automated software testing, including feature testing, regression testing, and system testing.
- Triggered logical blocks and maintained **CI pipelines** using **GitLab CI** and **Jenkins**, enhancing continuous integration and testing efficiency.
- Utilized **Docker** for containerizing test environments, improving deployment consistency and reducing environment-related issues.
- Set up and scheduled automated test cases for nightly runs, ensuring continuous software validation and quality improvement.
- Worked in a **Linux-based test environment**, including using shell commands for test execution, log analysis, and environment configuration.

## THESIS

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### RVC Automation: Enhancing Rear View Camera Testing with Automation

*Mbition (Mercedes-Benz Innovation Lab), Berlin, Germany*

#### \* **Phase 1: Comprehensive KPI Analysis for Rear View Cameras**

- Analyzed Key Performance Indicators (KPIs) to identify, classify, and prioritize factors impacting RVC performance.
- Documented findings to support the development of an automated testing framework.

#### \* **Phase 2: Development and Implementation of Automated Testing Framework**

- Designed and implemented tools/scripts to automate the RVC testing process entirely in software.
- Simulated real-world scenarios and automated data capture to ensure comprehensive testing of all conditions.
- Ensured system reliability and compliance with Automotive SPICE and ISO 26262 standards.
- Executed and maintained test automation in a **Linux-based environment**, including scripting, logging, and system configuration tasks.

#### \* **Expected Outcomes**

- Developed a robust automated testing framework for RVC systems, improving efficiency, accuracy, and reliability.
- Gained expertise in communication protocols including CAN, LIN, Ethernet, UDS, and XCP.
- Validated automated tests against manual methods, demonstrating superior performance.
- Automated testing was carried out on the software, utilizing predefined API points to ensure that CAN messages were readable and correctly processed.

## PROJECTS

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### **Object Detection Using Radar** | 09/2022 - 01/2023

- \* Worked on MMWCAS-RF-EVM radar by Texas Instruments with real-time data.
- \* Isolated dynamic objects from static points using velocity and discovered moving point clusters.
- \* Calculated cluster centroids and set a threshold for distance between bounding box centers and cluster centers.

### **Camera Calibration and Depth Estimation** | 03/2023 - 07/2023

- \* Conducted rigorous camera calibration to determine intrinsic parameters, including focal length and lens distortion coefficients.
- \* Produced distortion coefficients and provided images for calibration comparison.
- \* Calculated the intrinsic matrix to reduce noise and enhance image clarity.

### **Comparison of Lidar Sensors** | 09/2022 - 01/2023

- \* Analyzed point clouds from Blickfeld and Velodyne sensors, marking bounding boxes and determining the number of points within.
- \* Gained hands-on experience in data collection and analysis.

### **Coordinate Controlled Pick and Place Robot** | 03/2022 - 06/2022

- \* Implemented the A\* algorithm for a robot to execute pick-and-place tasks, successfully achieving project goals.

## LANGUAGES

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**English:** Professional Proficiency

**German:** Working Proficiency

**Kannada:** Native Speaker

**Hindi:** Intermediate