

Ashfaque P P

Automotive Software Engineer

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Location: Bangalore, India

PROFESSIONAL SUMMARY

Automotive Software Engineer specializing in Test Automation and Diagnostics. Expert in engineering robust test frameworks using Python, CAPL, C#, and C++. Proven track record of accelerating development cycles by automating CI/CD pipelines with GitLab and Jenkins. Proficient in Vector CANoe, vTestStudio, and ISO 14229 (UDS). Knowledgeable in AUTOSAR architecture and ISO 21434 Automotive cybersecurity standards.

TECHNICAL SKILLS

- **Automotive Standards:** ISO 14229 (UDS), ISO 21434 (Cyber Security), DoIP, CAN-FD, AUTOSAR, ASPICE.
- **Testing & Tools:** Vector CANoe, vTestStudio, CAPL, VT System, HIL/SIL Testing, Lauterbach Trace32, IBM DOORS.
- **Programming Languages:** Python (PyQt, Pytest), C#, C++, JavaScript, GDScript, Bash Scripting.
- **DevOps & Automation:** Git, GitLab CI/CD, Jenkins, Jira REST API, Robot Framework.
- **Development Tools:** Visual Studio 2022, VS Code, CAPL Browser, Godot Engine (Simulation/UI).

PROFESSIONAL EXPERIENCE

TATA ELXSI | Whitefield, Bangalore **Software QA Engineer** | *February 2023 – Present*

Spearheaded test automation, security validation, and tool development for multiple Tier-1 automotive projects.

Key contributions include:

Project: Automotive Security & Conformance (ISO 21434) | *Jan 2025 – Present*

- **Security Validation:** Engineered a **CAPL-based Fuzz Testing framework** for verifying Security Access (Seed & Key) and sub-function parameters, ensuring 100% compliance with OEM security specifications.
- **Test Automation:** Developed a high-performance **ODX-D & ARXML parser** (Python/C#) to auto-generate test vectors, reducing test configuration time by 80%.
- **HIL Integration:** Validated security conformance of **SecOC, DTC Setting, KeyM, SEL, IDSM** on **HIL (Hardware-in-the-Loop)** achieving up to 85% confidence with requirements.
- **Traceability:** Managed test execution for Agile sprints, maintaining **ASPICE-compliant** traceability from Requirements (DOORS) to Test Cases (vTestStudio).

Project: ECU Diagnostics & Flashing Automation | *July 2023 – Dec 2024*

- **UDS Protocol Validation:** Designed comprehensive **vTestStudio** scripts for **ISO 14229 (UDS)** validation, covering Complex Device Drivers (CDD), DTC setting, and Snapshot Data analysis.
- **CI/CD Pipeline:** Automated the **ECU Reprogramming (Flash Bootloader)** sequence using **Lauterbach Trace32** and Python, integrating it into the GitLab pipeline for nightly builds reducing manual efforts by 90%.
- **Restbus Simulation:** Modified **AUTOSAR** stub functions and C-code hooks to simulate missing ECU nodes, enabling stable desk-bench testing before HIL availability.
- **Scalability:** Implemented **Robot Framework** wrappers to parallelize diagnostic checks across multiple variants, cutting regression cycle time by 40%.

Internal Tools & DevOps Initiatives | *May 2024 – Present*

- **Workflow Automation:** Built a **PyQt-based Defect Management Tool** integrating **Jira REST APIs**, automating the "Ticket Creation" phase for test failures.
- **Log Analysis:** Developed a **C# Log Parser** for XML test reports, enabling automated "Root Cause Analysis" categorization for failed test steps.
- **IDE Enhancement:** Created a custom **VS Code Extension for CAPL**, standardizing code formatting and linting across the team to reduce syntax errors.

SIL (Software-in-the-Loop) Simulation Development | *Feb 2023 – Dec 2024*

- **Virtual Environment:** Architected a 3D **Vehicle Physics Simulator** (Godot Engine) to generate synthetic sensor data for **ADAS algorithm validation** in a SIL environment.
- **Network Emulation:** Implemented a **TCP/IP to CAN Gateway** (Python) to feed simulated vehicle speed and steering signals into **Vector CANoe** via virtual channels.
- **Panel Design:** Designed interactive **CANoe Panels** for real-time fault injection and signal manipulation during "Open Loop" simulations.

EDUCATION

Bachelor of Technology in Mechanical Engineering APJ Abdul Kalam Technological University | Wayanad, Kerala *June 2018 – July 2022* | **CGPA: 7.2/10.0**