SUDARSHAN C S

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SUMMARY

4+ years engineering production-grade automotive firmware across ISO 26262 ASIL projects on Infineon Aurix TC2xx/TC39x and NXP S32Kxx. Specialist in AUTOSAR Classic BSW (ComXf, E2EXf, DCM, DEM, MCAL), UDS bootloader development, CAN/CAN-TP stacks, and E2E protection — with hands-on Linux device driver development and Python test automation.

KEY HIGHLIGHTS

- **AUTOSAR Classic BSW & ASIL Safety:** ComXf, E2EXf, DCM, DEM, MCAL, RTE — production delivery on ISO 26262 ASIL ECUs
- **Bootloader & Security:** Custom UDS bootloader on Aurix TC2xx; RSA + SHA256 asymmetric firmware authentication
- **Linux Device Drivers & Kernel:** Character drivers, kernel modules, Device Tree, udev, sysfs, platform driver model
- **ASPICE SW2–SW5 Process Compliance:** Full lifecycle ownership from architectural design through unit verification and release

TECHNICAL KNOWLEDGE

Languages	C/C++, Python Scripting, Linux Shell Scripting
Protocols	CAN, UDS (ISO 14229), CAN TP (ISO 15765-2), I2C, SPI, UART, PWM, ADC, BLE, MQTT
AUTOSAR BSW	ComXf, E2EXf, COM, DCM, DEM, NvM, WdgM, EcuM, MemStack, MCAL, RTE, SWC, ASW
AUTOSAR Tools	AGNOSAR BSW Stack, ASTRA SWC Editor, ARXML configuration, DaVinci (familiar)
RTOS / OS	FreeRTOS, Linux (Red Hat), Linux Device Drivers, GDB, Terminal
MCUs	Infineon Aurix TC2xx, TC39x, STM32F4xx, ESP32, ARM Cortex-M4, NXP S32Kxx
IDEs / Debug	Aurix Development Studio, STM32CubeIDE, UDE Debugger, Trace32/Lauterbach, Espressif IDE, Eclipse
Tools	Vector CANalyzer, QAC (MISRA C), Visual Studio Code, Git, SVN, Jenkins CI/CD, LDRA
Standards	ISO 26262 Functional Safety, MISRA C Compliance, ISO 14229, ASPICE SW2/SW3/SW4

CAREER PROFILE

Senior Software Engineer Dec 2024 – Mar 2026

Avin Systems Pvt Ltd, Bengaluru

- Delivered AUTOSAR BSW modules (ComXf, E2EXf) for ASIL-compliant ECU programs on NXP S32Kxx.
- Owned full SW2–SW5 ASPICE lifecycle — from architectural design through unit verification and CI/CD integration.
- Led LDRA-based unit testing and MISRA C static analysis; integrated pipelines into Jenkins for automated regression.

Software Engineer April 2022 – Dec 2024

Crevavi Engineering Solutions Pvt Ltd, Bengaluru

- Developed and validated a UDS bootloader on Infineon Aurix TC2xx for secure field ECU reprogramming over CAN.
- Worked across embedded domains — bootloader, Linux device drivers, FreeRTOS SDV PoC, and motor control firmware.
- Tested low-level peripheral drivers (UART, I2C, SPI) and validated 7+ hardware interfaces on ARM Cortex-M4 platform.

EDUCATION

Bachelor of Engineering (B.E.), Electronics & Communication Engineering 2021 | CGPA: 7.5

GECK

PUC (PCMB) 2017 | 77.8%

MES PU College Malleshwaram

SSLC 2015 | 95.6%

Gnanodaya Convent and High School

PROJECT CONTRIBUTIONS

1. AUTOSAR BSW Modules – ComXf & E2EXf Developer

Avin Systems Pvt Ltd

C/C++, CAN, Ethernet, AGNOSAR, ASTRA, Trace32, Jenkins CI/CD, SVN, LDRA

- Engineered ComXf and E2EXf BSW modules to R24_11 spec, achieving full SWS traceability across SW2–SW5 ASPICE phases on an ISO 26262 ASIL project.

- Architected E2E protection layer (CRC + counter management) across multiple profiles, eliminating silent data corruption on multi-ECU CAN/Ethernet networks.
- Hardened Failsafe ASW with fault-reaction strategies and safe-state management, directly satisfying ASIL decomposition requirements.
- Integrated ComXf outputs into COM module for I-PDU formation; scaled serialization logic to cover both intra-ECU and inter-ECU composite data types.
- Configured DCM/DEM diagnostic stack and full CAN stack (CAN Driver, CAN IF, CAN TP) on NXP S32Kxx, enabling multi-frame UDS diagnostic throughput.
- Automated ARXML-based RTE generation via AGNOSAR toolchain, cutting manual configuration effort across SWC integration cycles.
- Executed LDRA-based unit testing and MISRA C static analysis across BSW modules; integrated test pipelines into Jenkins CI/CD for automated build and regression validation.

2. Bootloader Development – 2/4-Wheel Torque Transfer ECU

Crevavi Engineering Solutions

Embedded C/C++, Aurix TC2xx, CAN, ISO-TP, UDS, Eclipse, CANalyzer, QAC

- Developed UDS-based bootloader supporting secure ECU firmware updates over CAN (ISO-TP multi-frame communication) at 500 kbps on Aurix TC2xx.
- Integrated and validated UDS services for session management, security access, and firmware flashing sequence (0x10, 0x11, 0x27/28, 0x34, 0x36, 0x37) with a 7-state FSM.
- Hardened security by migrating from symmetric key to RSA + SHA256 asymmetric authentication, eliminating firmware spoofing attack surface.
- Built Flash driver abstraction over Infineon APIs covering sector erase, page-aligned write, ECC detection, and CRC32 post-flash verification.
- Enforced MISRA C compliance via QAC across all modules; validated full reflash cycle with Vector CANalyzer, achieving zero regression failures.

3. OBN G3 – On Board Networking

Tessolve Semiconductors

Embedded C, Python, Shell Scripting, I2C, SPI, UART, USB, TCP/IP | ARM Cortex-M4, Red Hat Linux, MPLAB IDE, Congatec MA7 Module

- Developed Linux character device driver with full file_operations (open, read, write, ioctl) for peripheral control from user space.
- Leveraged Linux internals — kernel modules, udev rules, Device Tree overlays, sysfs, platform driver model — to manage hardware across 7+ board interfaces.
- Implemented and tested low-level drivers for UART, I2C, and SPI on ARM Cortex-M4 using MPLAB IDE on Congatec MA7 module.
- Validated communication protocols (UART, USB, Ethernet, I2C, SPI, mSATA, cellular, Wi-Fi) against functional specs; automated board-level regression suite using Python, Shell Scripting, and C.

4. SDV-Based Remote Keyless Fob PoC

Crevavi Engineering Solutions

Embedded C, FreeRTOS, MQTT, BLE, ESP32, Espressif IDE, Linux

- Delivered an SDV PoC on ESP32 with BLE proximity authentication, achieving secure keyless vehicle access with sub-second lock/unlock response.
- Integrated fingerprint sensor, central locking, and power window control via FreeRTOS task scheduling and MQTT cloud telemetry in a single firmware build.

5. Power Window with Anti-Pinch Safety Mechanism PoC

Crevavi Engineering Solutions

Embedded C, STM32F407x, PWM, ADC, STM32CubeIDE, MATLAB Simulink and Code Generator

- Engineered PID motor control with current-sensing anti-pinch detection on STM32F407x; system triggers automatic reversal within safety response time limits.
- Validated obstruction detection accuracy and motor reversal timing against automotive safety benchmarks using Simulink simulation before hardware deployment.