Gobinath Kannan



Senior Embedded Software Engineer

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Nationality: Indian | Permanent residence permit (Niederlassungserlaubnis)
Available immediately

Profile

Embedded software engineer with about 10 years of experience in C and C++ firmware for automotive and industrial products. At E-Works Mobility I rebuilt an OEM's complete instrument cluster alone by reverse-engineering its hardware and software, and took it from prototype to production in about 70–80 vehicles. Strong in CAN-based systems, bootloaders and OTA updates, hardware bring-up and signal-level debugging. Former technical lead of a small embedded team with direct customer contact.

Professional Experience

Oct 2022 – Jul 2026 **Embedded Software Developer** *Ismaning, Germany*
E-Works Mobility GmbH

Diesel-to-electric vehicle conversion. Working student first, then full-time. Employment ended in July 2026 due to the company's insolvency.

- **Instrument cluster:** Sole firmware owner of the instrument cluster. Rebuilt the OEM's complete cluster alone by reverse-engineering its hardware and software (the OEM had a full team for it), added new functions, integrated it into our vehicle and took it from prototype to production in about 70–80 vehicles.
- STM32H7 with FreeRTOS (CMSIS-RTOS v2); 480×800 RGB TFT with TouchGFX GUI in C++ and SDRAM framebuffer; stepper-motor gauges, LEDs, ADAS and safety warnings; interrupts, DMA, D-/I-cache, timers and state machines. Audio: evaluated I2S on STM32F4, then built SAI playback on STM32H7 with a MAX98090 codec and assets in QSPI flash.
- **CAN:** The cluster communicated with every ECU in the vehicle, received data from the VCU and BMS and exchanged commands with the VCU. I decoded the OEM's CAN messages and defined the CAN interfaces between cluster, low-voltage junction box (LVJB) and telematics unit (TCU).
- **CAN bootloader:** Composite image across internal and external QSPI flash, adapted open-source ISO-TP library, CRC32 integrity check on every boot and recovery from interrupted updates. CAN over the wire harness was the only access to the ECU.
- **Hardware:** Selected MCU, flash, LCD and LED drivers, supplied hardware requirements for schematic and PCB, reviewed schematics and supported board bring-up. Worked directly with suppliers in China for parts and rapid prototypes.
- **OTA updates:** Built the C++ OTA application on the Raspberry Pi-based TCU (Linux). It receives firmware over LTE through a WireGuard VPN (SSH/SCP), verifies it and flashes the ECUs over CAN. Deployed in about 70–80 vehicles in the field. Also brought up a Quectel GPS/LTE module in a prototype phase.
- **LVJB:** Developed firmware features on STM32F4 together with the team: overcurrent detection, fault recovery and reporting, safe-state handling, bootloader-side update support, and a hardware-version layer so one binary runs on all PCB revisions.
- **Testing:** Built a hardware-in-the-loop bench test for the cluster with PCAN-Explorer: recorded vehicle CAN traffic replayed against the real hardware, with pass/fail reports. It became part of our release validation. Python test benches, unit tests, MISRA-C, GitLab CI/CD.
- **Debugging and process:** Signal-level debugging with oscilloscope, logic analyzer, JTAG/SWD, PCAN-Explorer and BUSMASTER; root-cause analysis on the bench and in the vehicle. Wrote architecture and API documentation. Agile/Scrum with sprint planning, sprint reviews and code reviews.

Jan 2022 – Sep 2022 **Software Designer (Research Assistant, Werkstudent)** *Chemnitz, Germany*
Technische Universität Chemnitz

- Firmware on a 32-bit MCU for the "Growthboxes" research prototype: reading temperature and humidity sensors and controlling pumps and actuators.

- ESP32 IoT devices sending sensor data over MQTT to ThingsBoard, with dashboards and device control.

Aug 2018 – Sep 2021 **Technical Lead** *India*
Intellipredikt Technologies Pvt. Ltd.
Joined as Senior Software Engineer, promoted to Technical Lead in June 2019.

- Led and mentored a small embedded team: task assignment, technical reviews and customer contact with Fiat Chrysler, Eaton, Nissan and Dearborn Group.
- Built CAN/J1939, ISO 15765 and UDS stacks for production dataloggers.
- Worked to the V-model: requirements, architecture, system design, implementation and test cases traced back to requirements, with phased releases.
- Delivered the BLE 5.0 mesh stack for the Autoliv MLT seat-belt monitoring system.
- Built a production Android diagnostic app for Dearborn Group (Bluetooth to vehicle-bus bridge); ported the RP1227 API from Windows to Android and added CAN bus statistics.
- Firmware for Wipro asset-monitoring gateways with GSM and Bluetooth.

Dec 2017 – Aug 2018 **Embedded Software Developer** *India*
Analog and Digital Labs

- Wireless traffic-control system for the Tamil Nadu Police: Wi-Fi communication, SPI output control and PCB design. LED scroll board with audio.

Jun 2016 – Dec 2017 **R&D Engineer** *India*
Lakshmi Info Tech

- Industrial data loggers with Wi-Fi; Modbus-based energy monitoring on Raspberry Pi for Texmo Industries.

Skills

Programming	C, C++, Python, MATLAB
Microcontrollers	ARM Cortex-M (STM32 F4/H7), ESP32, NXP, TI, Silicon Labs; Raspberry Pi
RTOS / OS	FreeRTOS (CMSIS-RTOS v2), TI-RTOS, Linux (application level)
Automotive	CAN, CAN FD, ISO-TP (ISO 15765), J1939, UDS; AUTOSAR and V-model
Interfaces	SPI, QSPI, I²C, UART, I2S/SAI, LIN, Ethernet, RS-232/485, Modbus, MQTT, BLE (GATT, advertising, pairing, mesh), Wi-Fi, LTE
Hardware	Schematic and 4-layer PCB design in KiCad, Gerber/BOM, board bring-up, component selection
Bootloader / OTA	CAN bootloader, CRC32 integrity check, recovery from interrupted updates, OTA over LTE
Toolchain / Debug	GNU toolchain (arm-none-eabi-gcc, make, CMake), gdb, OpenOCD, VS Code, STM32CubeIDE, J-Link, ST-LINK, oscilloscope, logic analyzer
Tools	Git, GitLab CI/CD, Jira, Confluence, Doxygen, TouchGFX, PCAN-Explorer, BUSMASTER
Methods	Unit testing, HIL bench testing, MISRA-C, code reviews, Agile/Scrum

Education

Oct 2021 – Apr 2026 **M.Sc. Embedded Systems (grade 2.1)** *Chemnitz, Germany*
Technische Universität Chemnitz

- Thesis (1.7): analog excitation signals for bioimpedance measurement on STM32 – signal generation, acquisition and processing, energy efficiency analysis with MATLAB.
- Research project (1.3): ESP32 measurement system for 32 force-sensitive resistors, including PCB design in KiCad.
- Coursework: real-time systems, automotive platforms (AUTOSAR, CAN, FlexRay, Automotive Ethernet), DSP, FPGA design (VHDL), verification and test, network security (PKI, TLS).

2012 – 2016 **B.E. Electronics and Communication Engineering** *India*
Info Institute of Engineering, Anna University, Chennai

Languages

English: C1 (fluent) **Tamil:** native **German:** A1 (Goethe certificate); A2–B1 course from Nov 2026