

Karan Gandhi

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Permanent Resident of Canada | Open to Relocation

Embedded Firmware Engineer | AI-Augmented Embedded Systems

Embedded C firmware engineer with 3+ years at Qualcomm developing and optimizing production firmware for ARM-based LTE / 5G modem platforms. Experienced in RTOS, low-level drivers, power management, and system debugging. Focused on reliable, production-grade embedded software from bring-up to release. Currently exploring and building AI-assisted workflows for debugging, validation, and system design in embedded environments.

TECHNICAL SKILLS

Embedded & Firmware Development: **C, C++, RTOS (FreeRTOS), Assembly**
Microcontrollers & Platforms: **ARM Cortex-M** (STM32, TI TM4C, ESP32)
Drivers & Low-Level Software: **HAL drivers, bare metal firmware, bootloaders**
Communication Protocols: **CAN, UART, SPI, I2C, Ethernet/IP, BLE**
Debugging & Test: **JTAG, GDB, oscilloscopes, logic analyzers**
Tools & Processes: **Git, JIRA, Jenkins**
Scripting & Automation: **Python** for debugging, diagnostics, and log analysis

PROFESSIONAL EXPERIENCE

Embedded Software Engineer – Qualcomm Technologies Inc, USA June 2020 – April 2023

- Developed production C firmware for ARM-based LTE / 5G modem platforms serving global carriers
- Reduced crash-log debug effort ~30% via Python-based diagnostic tooling
- Debugged complex power, timing, and cross-subsystem integration issues
- Validated initialization flows and low-power transitions through on-target integration testing
- Contributed to firmware releases deployed in commercial modem products
- Role concluded due to organizational restructuring and U.S. visa constraints, currently a Canadian Permanent Resident

SELECTED PROJECTS

[BLE Environmental Sensor Node](#) — ESP32-C3 2026

- Built a spec-driven BLE environmental sensor node using ESP32-C3, ESP-IDF, NimBLE, custom GATT services, and SSD1306 OLED display
- Implemented notification-based telemetry, secure BLE pairing/control, persistent configuration, Android companion app integration, and pure-C TinyML classification

[STM32 Virtual Vehicle ECU](#) — STM32F446RE 2025

- Built STM32-based vehicle control simulation system using FreeRTOS, CAN, UART, and a custom bootloader
- Achieved deterministic task scheduling and modular embedded architecture

[Linux Virtual Network Driver \(vnet-driver\)](#) — Linux Kernel Module (C) 2025

- Implemented a Linux virtual Ethernet network interface driver using netdevice APIs
- Validated packet flow through kernel-level debugging

EDUCATION

Master of Science (Electrical Engineering) - University of Texas at Arlington 2018 – 2019

- *Major: Embedded Systems (4.0 GPA)*

Bachelor of Engineering (Electronics Engineering) - University of Mumbai 2013 – 2017