**Sudhir\_80pc** 📧 sudhir\_80pc@gmail.com | 📱 +91 9845521621 🏛 Bangalore University, B.E. in Electronics Engineering | Graduated: 2000 🧠 24+ Years Experience in Embedded Systems & C Programming

**🧩 Professional Summary**

Seasoned Embedded Systems Engineer with 24 years of experience in low-level firmware development, real-time systems, and hardware integration. Specializing in efficient C programming for microcontrollers, device drivers, and memory-constrained environments. Adept at architecting scalable embedded solutions across domains including automotive, IoT, and industrial automation.

**🧠 Core Technical Expertise**

**C Programming & Embedded Systems**

* Proficient in C (C99/C11), pointer arithmetic, function pointers, and bit-level operations
* Strong grasp of memory management, const correctness, and volatile usage
* Developed bootloaders and firmware update mechanisms (FOTA/OTA)
* Experienced with hardware register configurations and memory-mapped I/O
* Skilled in implementing and debugging multi-threaded code with mutexes, semaphores, IPC
* Developed and maintained device drivers: SPI, I2C, UART, CAN, USB
* Expertise with cross-compilation toolchains: GCC for ARM, Keil, IAR
* Created Hardware Abstraction Layers (HAL) and integrated power management routines
* Deep understanding of startup code and linker scripts for embedded platforms

**RTOS & Systems Programming**

* Developed software components on FreeRTOS and RT-Thread
* Troubleshot real-time issues: deadlocks, priority inversion, task starvation
* Context switching and task scheduling optimization for real-time constraints
* Experienced in writing and optimizing Interrupt Service Routines (ISRs)

**Testing, Debugging & Tools**

* Hands-on with JTAG/SWD debuggers, logic analyzers, oscilloscopes, protocol analyzers
* Proficient with GDB, Git versioning, and build automation (Make/CMake)
* Performed unit, integration, and system-level testing on target hardware
* Conducted memory leak detection, stack profiling, and static code analysis

**🤝 Collaboration & Documentation**

* Worked alongside hardware engineers and QA teams through full product lifecycle
* Created design specs, API references, and validation documentation
* Active participant in Agile methodologies: sprint planning, stand-ups, retrospectives

**🌱 Additional Skills & Exposure**

* Familiarity with STM32, NXP, and ESP32 microcontroller families
* Basic proficiency in Python and C++ for tooling support and automation
* Experience with BLE and TCP/IP stack implementation
* Exposure to MISRA C and IEC 61508 for compliance in safety-critical applications

**🏆 Key Achievements**

* Architected firmware platform reused across multiple automotive ECUs
* Reduced interrupt latency and improved ISR throughput by 40%
* Streamlined memory usage on constrained devices resulting in 15% footprint savings

**👨‍💻 Projects & Domains Worked In**

* Automotive infotainment and telematics systems
* Industrial IoT gateways and controllers