BHARGAVI U

EMBEDDED SOFTWARE ENGINEER

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Objective

Embedded Software Engineer with 3 years of experience in software development, testing, and system analysis. Proficient in C, C++, with hands-on experience in Linux-based systems. Focused on continuous learning and growth in the embedded domain.

Professional Skills

- **Programming Languages –** Embedded C, C++, Python (Basics).
- **Embedded Linux –** Kernel Development, device drivers (I2C, SPI, UART), U-Boot, Yocto, Peta Linux.
- **Build Tools –** CMake, Make, GCC, Cross- Compilation.
- **System Level Expertise –** Linux internals, multithreading, IPC mechanisms, Debugging with JTAG, JLink debuggers.
- **IDE –** Segger Embedded Studio, Aurix Development Studio, Infineon iLLD.
- **Protocols –** I2C, SPI, UART, CAN, LIN, UWB, Wi-Fi, TCP/IP.
- **Audio & Graphics –** ALSA, DSP Fundamentals, OpenCV, OpenGL
- **Qualcomm tools –** QFIL, QPST, ADB Shell, Fast boot commands, Configpro.

Work Experience

CAPGEMINI ENGINEERING | EMBEDDED SOFTWARE ENGINEER **JUNE 2022-DEC 2024**

BENCHMARKING **April 2024 – Dec 2024**

- Integrated **Auto Bench** and **Core Mark-Pro** with Infineon AURIX TriCore MCU example projects using C, customizing linker scripts and start-up code for memory optimization and benchmark accuracy.
- Conducted performance benchmarking of key peripherals ADC, CAN, I2C, SPI, and UART, analysing core utilization and memory access patterns via UART and memory-mapped data; validated results using **oscilloscopes**.
- Developed and executed latency, throughput, and **interrupt response test cases** under varying load conditions using Infineon AURIX Development Studio with High-Tec GCC and Tasking VX tool chains.
- Proficient in **ADAS technologies** and familiar with **Hardware Security Modules (HSM)** for secure embedded system design.

SPATIAL AUDIO **Jan 2024 – March 2024**

- Developed a spatial audio system on **NVIDIA Jetson Nano**, integrating UWB-based distance measurement (via Decawave API over UART) with 3D audio positioning using **DSP** techniques and **ALSA** for low-level audio control.
- Implemented low-latency UWB communication using **Python**, **C++**, and OpenCV to process real-time location data and enable directional audio output; implemented **time-of-flight algorithms** for accurate RTLS.
- Experienced in edge AI development and parallel programming with **CUDA** on Jetson platforms; familiar with setting up J-Link debugger and Segger Embedded Studio for embedded development.

5G ORAN (FLEX) **Sep 2024 – Nov 2024**

- Proficient in Linux kernel development, including writing and debugging device drivers I2C, SPI, UART, working with device trees, **/dev** management, and **IPC mechanisms** (shared memory, semaphores, and message queues).
- Experienced with AMD **PetaLinux**, **Yocto**, and **CMake**, creating custom Linux distributions and managing real-time driver integration and cross-compilation workflows for embedded systems.
- Developed automation and configuration management solutions using **Ansible**, improving deployment efficiency for embedded platforms; skilled in multithreading and context switching for **performance optimization.**
- Hands-on expertise in high-speed communication, including 25G SFP modules, **TCP/IP**, and wireless protocols like **OFDM** and **Wi-Fi**, with a focus on low-latency, high-throughput systems.
- Knowledgeable in antenna tuning via **Remote Electrical Tilt (RET)** and experienced with JTAG debugging of kernel and user-space applications to ensure system reliability and performance.

CAPGEMINI ENGINEERING | TRAINEE **DEC 2021- JUNE 2022**

5G MiFi Hotspot (INSEEGO)

- Extensive experience with **Qualcomm SDX55/SDX65** chipsets, including modem architecture, system-level integration, and modem stress testing (NAND, torture tests) to ensure stability under extreme conditions.
- Developed and debugged **Linux character device drivers**, managing device nodes and system calls (read, write, ioctl) for robust user-kernel space interaction; skilled in kernel-space driver optimization.
- Proficient in Android system development, including **ADB debugging**, firmware flashing via **Fastboot**, and device recovery procedures; experienced in package management and update workflows in Qualcomm environments.
- Practical knowledge of **charging protocols** and power management techniques to optimize energy efficiency and system longevity.
- Familiar with IEEE 802.11 a/b/g **Wi-Fi protocols**, and skilled in low-level debugging and hardware/software performance tuning using JTAG.

Education

Agni College of Technology | Bachelor of Engineering **2021**

Electronics and Communication Engineering 73%

Journal Published

Intensive Health Monitoring Unit using FPGA –

https://ijireeice.com/papers/intensive-health-monitoring-unit-using-fpga/
