Thamaraimanalan M

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Education

Government College of Technology Coimbatore, India
Bachelor of Engineering in Electronics and Communication; CGPA: 7.9/10 *2022 – 2026*

Experience

Project Intern Feb 2025 – Jun 2025
FOSSEE (Free/Libre and Open Source Software for Education), IIT Bombay *Remote*

- Developed simulation automation tools using Python and PyQt6, reducing manual testing time for OpenModelica workflows.
- Integrated Python scripts with Linux-based simulation backends; gained experience in process automation and software testing.

Projects

RP2040 Bare Metal Firmware | *Embedded C, ARM Cortex-M0+, GNU Toolchain* | GitHub

- Developed a bare-metal C driver for the RP2040 microcontroller without external libraries or SDKs.
- Configured hardware peripherals (SIO, IO_BANK0) by directly manipulating memory-mapped registers derived from the datasheet.

Linux Kernel | *C, Linux, QEMU* | GitHub

- Cross-compiled Linux Kernel v6.x for ARM64 on QEMU with a custom init process.
- Developed Loadable Kernel Modules (LKMs) with module parameters.

Linux System Utilities (CShell & CJam) | *C, POSIX, Linux API* | Projects Link

- Developed custom system tools in **C** utilizing **POSIX APIs** for process management (`fork`, `exec`) and system automation.
- Built a minimal **Unix Shell** from scratch, implementing command parsing, `PATH` resolution, and built-in commands.
- Developed a C wrapper for aircrack-ng suite.

Project Eye | *Raspberry Pi 5, Edge-AI* | GitHub

- Built an assistive wearable on Raspberry Pi 5 for real-time edge-AI processing and vision assistance.

Technical Skills

Languages: C (Embedded/Systems), Python, Bash/Shell, Data Structures
Embedded & Systems: Bare Metal Firmware, Device Drivers, RTOS Concepts (Zephyr), ARMv8-A Architecture (MMU), Linux Kernel
Tools: Git, GitHub, Make, GDB, Linker Scripts, QEMU, Vim, GCC Toolchain
Hardware: ARM Cortex-M0+ (RP2040), Raspberry Pi 5

Achievements & Certifications

Contributor | *The Zephyr Project (Open Source)* 2026

- Merged pull requests improving official documentation and updating CI compliance scripts; gained familiarity with the open source contribution workflow.

A Beginner's Guide to Linux Kernel Development (LFD103) | *The Linux Foundation* 2026

- Completed comprehensive training on kernel architecture, building, and the patch contribution workflow.

Linux Device Drivers & Embedded Systems | *Pyjama Cafe* 2025 - Present

- Hands-on training in C, ARM Cortex-M, ARMv8-A (AArch64) architecture, and writing basic Linux kernel drivers.

Regional Finalist | *NXP AIM (Artificial Intelligence in Mobility)* 2025
3rd Place, Global Coding Competition | *Qt-Athon* 2024

Languages

English: Fluent — **Tamil:** Native