MERSAD KARIMI

Embedded Linux Developer

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SUMMARY

Embedded Linux Developer with hands-on experience in system integration, cross-compilation, bootloader customization (U-Boot) and Yocto-based build systems. Proven track record of building automated aarch64 toolchains, implementing device-tree and MMC improvements in bootloaders, and delivering project-based solutions (e.g., BusyPy, Cross-Compiler From-Scratch, U-Boot on Web) using C and Python.

EDUCATION

Shamsipour Technical College
Associate Degree in Software Engineering
2023– 2025

Azad University
Associate Degree in Software Engineering
2025 - current

SKILLS

- Embedded Linux System Integration
- Yocto Project & Open Embedded
- Real-Time System Design using PREEMT-RT
- Embedded Software Programming
- Embedded Device Driver Development

CERTIFICATIONS

- Embedded Linux From Scratch | Fanavaran Anisa
- Embedded Linux System Integration | Fanavaran Anisa
- Yocto Project & Open Embedded Development | Fanavaran Anisa
- Embedded Device Driver Development | Fanavaran Anisa
- Real-Time Linux with PREEMT-RT | Fanavaran Anisa

PROJECTS

Cooling Fan Control via Audio Jack

- This project demonstrates a creative hardware–software integration where system temperature is monitored through Linux sysfs and an audio signal is generated using ALSA. The signal is routed through the laptop's audio jack and converted externally to drive a cooling fan when a temperature threshold is exceeded, showcasing an unconventional yet practical control interface under hardware constraints.

RootFS Fallback Mechanism

- This work introduces a Linux kernel–level fallback mechanism that allows multiple root filesystems to be passed via a custom boot parameter with defined priorities. The kernel attempts to mount each rootfs sequentially (block devices, PARTUUID, MTD/UBI, or network filesystems like NFS) until successful, increasing system reliability in embedded environments with unstable storage or networking.

Embedded Linux Practices Repository

- A curated collection of hands-on Embedded Linux exercises and experiments covering core system components such as toolchains, bootloaders, root filesystem management, and low-level system integration. The repository is designed for practical learning, reproducibility, and real-world embedded workflows, reflecting a system-level engineering mindset.

- Using Mobile Phone as Rootfs: Booting an embedded target by exposing a phone storage as a USB mass-storage root filesystem.
- Paper Memory: Executing reconstructed binary data recovered from printed paper using image processing.
- Cross-Compiler From Scratch: Building a complete AArch64 cross-toolchain step by step from source.
- Writing init in Python: Implementing a minimal Linux init process in Python for educational and embedded use.
- Auto FDT Address Adjustment: Automatically fixes device-tree (FDT) load addresses in U-Boot during boot.