Arjun Mehta

System Software Engineer | Embedded Systems | Linux Kernel Development
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1. Professional Summary

Experienced System Software Engineer with 8+ years of expertise in **low-level programming** and **embedded systems** development. Specializing in **Linux kernel** development, **device drivers**, **RTOS**, and **performance tuning**, with a strong focus on **hardware-software integration**. Passionate about **open-source contributions**, **Rust adoption**, and **building scalable, reliable systems** that interface directly with hardware. Known for problem-solving complex issues, performance optimization, and mentoring junior engineers.

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2. Core Competencies

- **System Software Development**: Linux Kernel, Embedded Firmware, RTOS
- **Languages**: C, C++, Rust, Assembly (x86, ARM)
- **Operating Systems**: Linux, FreeRTOS, QNX
- **Performance Tuning**: Memory Management, Cache Optimization, Multi-threading
- **Embedded Development**: Device Drivers, Bootloaders, Firmware
- **Tools**: GDB, Valgrind, perf, strace, oscilloscope
- **Version Control**: Git, Gerrit
- **Build Systems**: Yocto, CMake, Make
- **Soft Skills**: Cross-functional Collaboration, Documentation, Technical Leadership, Code Reviews

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3. Professional Experience

Senior System Software Engineer

Kronix Systems — Seattle, WA
January 2021 – Present

- Led the development of **embedded Linux memory management** subsystems and **kernel modules** for custom hardware solutions.
- Designed and optimized **device drivers** for high-performance hardware, improving system stability and performance by 40%.
- Implemented **Rust-based firmware** modules to reduce crash rates and improve safety in low-level code.
- Collaborated with **hardware teams** for **board bring-up** and integration with embedded systems.
- Mentored junior engineers, conducted **code reviews**, and ensured adherence to best engineering practices.

Key Achievements:

- Improved boot time for embedded devices by 30% through kernel and firmware optimizations.
- Reduced crash rates by 35% by introducing Rust-based firmware and improving error handling.

System Software Engineer

Pivora Technologies — San Jose, CA
July 2017 – December 2020

- Developed **networking stack components** for a custom **Linux-based router OS**, optimizing throughput by 20%.

- Built and deployed **firmware** for IoT devices based on **ARM Cortex-M4** and **FreeRTOS**.
- Worked on system diagnostics tools and **performance monitoring** for embedded systems.
- Collaborated with cross-functional teams to meet client specifications for embedded solutions under tight deadlines.

Key Achievements:

- Delivered a **custom embedded OS** solution that enabled **secure IoT communication** for clients, increasing market adoption by 15%.

Freelance / Open Source Contributor

Ongoing (2018–Present)

- Contributed patches to the **Linux kernel**, improving memory management and optimizing network subsystems.
- Developed **custom bootloaders** for embedded systems in the **ARM architecture**, ensuring optimized boot sequences.
- Consulted for various tech startups on **RTOS** and **embedded Linux development**.

Key Contributions:

- Delivered **Linux kernel patches** accepted into upstream codebases, focusing on performance and memory optimization.
- Provided technical consulting to **startups** in the **IoT** and **hardware interface** sectors.

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4. Education

M.S. in Computer Engineering

University of Illinois Urbana-Champaign — 2017

- Focus on **Operating Systems**, **Real-Time Systems**, and **Hardware-Software Integration**.
- **Thesis**: "Optimizing Memory Management in Linux for Embedded Systems"

B.Tech in Electrical Engineering

Indian Institute of Technology (IIT) Bombay — 2015

- Specialization in **Embedded Systems**, **Digital Logic Design**, and **Microcontroller Programming**.

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5. Certifications

- **Certified Embedded Systems Developer (CEED)**
- **Rust Programming for Embedded Systems – Udemy (2024)**
- **Linux Foundation LFCE (Certified Engineer)**

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6. Technical Skills

- **Programming Languages**: C, C++, Rust, Assembly (x86, ARM)
- **Operating Systems**: Linux (Ubuntu, Debian), FreeRTOS, QNX
- **Embedded Development**: Device Drivers, Firmware Development, Custom Bootloaders
- **Performance Tuning**: Memory Optimization, Cache Management, Latency Reduction
- **Tools**: GDB, Valgrind, perf, strace, oscilloscope
- **Version Control**: Git, Gerrit
- **Build Systems**: Yocto, CMake, Make

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7. Open Source Contributions

- **Linux Kernel**: Contributed patches to **memory management** and **networking subsystems** to improve kernel performance on embedded systems.
- **Embedded Systems Projects**: Contributed to multiple **open-source embedded Linux projects**, including **FreeRTOS** and **Yocto-based systems**.
- **Bootloader Development**: Developed **custom bootloaders** for **ARM-based** embedded systems, ensuring optimized boot sequences.

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8. Projects

Open Source Linux Kernel Contributions

- **Role**: Contributor
- **Details**: Contributed memory management optimizations and network stack improvements for better performance on embedded Linux platforms.

Custom Bootloader for ARM Devices

- **Role**: Developer
- **Details**: Developed a lightweight **bootloader** for ARM-based embedded systems, reducing boot time by 1.5 seconds and improving system reliability.

IoT Firmware Development

- **Role**: Firmware Developer
- **Details**: Developed and deployed **firmware** for IoT devices using **ARM Cortex-M4 microcontrollers** with **FreeRTOS**, ensuring low power consumption and reliable communication.

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9. Client Portfolio

Sarah Lawson, VP of Engineering

Kronix Systems

- Collaborated on optimizing **embedded Linux firmware** for new product releases, ensuring faster boot times and better resource management.

Michael Tan, Senior Hardware Engineer

Pivora Technologies

- Worked on developing embedded systems for IoT applications, focusing on **real-time performance** and **network reliability**.

John Davis, CTO

RedByte Corp.

- Provided performance consulting for a **Linux-based networking solution**, improving throughput and system stability.

Jessica Wu, Director of Systems Engineering

NovaTech Solutions

- Assisted in **custom Linux driver development** for proprietary hardware, ensuring compatibility with diverse operating environments.

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10. Portfolio & Contact Information

- **Portfolio Website**: arjunmehta.dev
- **GitHub**: github.com/arjunmehta-sys

- **LinkedIn**: linkedin.com/in/arjunmehta-sys
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