

James Kiarie

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Low-level systems developer

Recent CS grad with interest and skills in embedded-rust, embedded-OSes and firmware development. Documentation freak and OSS enthusiast. Currently learning concurrent rust and firmware development.

PROJECTS

WASI-compliant minikernel (ongoing)

12/2022 - Present

(<https://github.com/kiarie404/Hobo-OS>)

For my 4th year CS project, I build a specialized kernel developed in Rust and RISC-V Assembly. Its primary purpose was to streamline the installation and execution of WebAssembly (WASM) modules on IoT devices. This was achieved by exporting system calls using WebAssembly System Interface (WASI) prototypes and running WASM modules in Supervisor-mode. This approach enhances code portability and security within the IoT ecosystem, making it easier for developers to deploy and manage applications on a variety of microcontroller platforms.

It is an unfinished project and I occasionally work on it.

Driver Development Book (ongoing as part of RustaceansKenya project)

(<https://rustaceanskenya.github.io/driver-development-book/>)

The driver development book is a project that aims to teach readers how to procedurally write a UART driver for a RISC-V chip called ESP32C3 and a Qemu-riscv-virt board. It aims to cover topics such as safe-abstractions, flashing algos, logging, testing and low-level concurrency

WORK EXPERIENCE

RustaceansKenya

Nairobi (half remote) • 11/2023 - Present

Voluntary Embedded Mod • Part-time

- Assisted in organizing physical and virtual meetups for Rustaceans. This involved contacting & forming partnerships with interested organisations.
- Writing a book on driver-development with Rust (ongoing project)
- Teaching university students driver-development through virtual meetups

IMS Guru Ltd

Nairobi • 05/2022 - 08/2022

Web Developer Intern • Internship

- Developed a comprehensive documentation website for a core product.
- Collaborated with a mentor to create three production-ready websites using HTML, CSS, and JavaScript.
- Enhanced SEO strategies to improve search engine rankings.
- Contributed to client onboarding processes.

Equity Bank
Bank Teller

Nakuru • 02/2019 - 08/2019

- Participated in the Equity Leadership Program for seven months after completing KCSE and before beginning Computer Science studies. Gained valuable communication skills and financial sector insights.

EDUCATION

Bachelor of Science in Computer Science

University of Nairobi

Nairobi, Kenya • 09/2019 - 09/2023

Learnt the fundamentals, took an internship and then did a final year project on a WASI-compliant kernel.

SKILLS

- Programming : Rust, Riscv, C & C++.
- Technical documentation
- Version control : git, github
- Low-Level Systems Development (drivers & mini-kernels)
- Wasm Integration to edge devices

REFERENCES

Harsha Mandapati (Director, CEO at IMS Guru ltd)

harsha@imguru.com