Abdallah Mohamed Adam Ali
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Summary

Backend and embedded systems engineer with strong expertise in Rust (Tokio, Axum), C/C++, Python, database building, and system infrastructure design and integration. Experienced in developing end-to-end IoT and backend architectures, including real-time data ingestion, analytics, and visualization. Skilled in API interfacing, Nix/NixOS, eBPF (Aya), SurrealDB, and embedded firmware development. Capable of designing reliable, high-performance systems that bridge hardware and software. Native Arabic speaker and professional in English.

Skills

Programming
- Rust (Tokio, Axum, Dioxus).
- API Interfacing.
- Nix/NixOS.
- Aya eBPF.
- SurrealDB.
- C/C++ - Python.
- Git.
- Embedded Systems & Firmware.
- IoT Systems - Electronic Circuit Design.

Soft skills
- Teamwork and collaboration.
- Time Management.
- Communication.
- Problem Solving.
- Attention to detail.
- Adaptability.
- Analytical thinking.

Projects

- **Space Time clock: [Link]**   **Oct 2021 - Nov 2022**

Designed control circuits for stepper motors and developed the control system in Python and C for a Raspberry Pi platform.

- **Water Monitoring System: [Link]**   *Dec 2018 - Oct 2020*

Built a multi-zone water-quality monitoring platform using Python, with role-based access, data isolation, and centralized administration.

Developed backend logic for data ingestion, validation, and trend analysis, improving automation and decision-making.

- **UV Sterilization System : [Link]**   *Feb 2019 - Dec 2020*

Engineered an IoT UV sterilization device integrating motion/current sensors, wireless control, manual override, and real-time alarms.

Implemented embedded firmware, web interface, and system logic, ensuring safe autonomous operation.

- **SMS Automatic Response System:** [**Link**] *Apr 2019 - Mar 2020*

Developed an embedded–to–server SMS response system where messages are received, processed automatically or manually, and returned via SMS.

Built ESP32 firmware, server-side handling, and communication workflows for reliable bidirectional messaging.

Experience:

- **Teaching Assistant (Part-Time)**

Faculty of Science at the Physics Department, University of Khartoum: *Dec 2017 - Dec 2020*

Prepared and delivered physics laboratory experiments, ensuring proper calibration and functionality of lab equipment, and maintained computer hardware and software at computer labs.

- **Course Instructor/Trainer (Part-Time)**

STEM Education Sudan: *Dec 2017 - Dec 2020*

Taught basic electronics and embedded systems (Arduino, ESP32/8266) during youth summer camps.

- **Teaching Assistant ((Part-Time)**

Almadin College for Science and Technology: *Nov 2017 - Feb 2019*

Delivered first-year physics laboratory sessions.

- **Teaching Assistant (Part-Time)**

The Nile College: *Nov 2017 - Feb 2018*

Delivered first-year physics laboratory sessions.

Education:

- ***BSc (Honors) in Physics*** at the University of Khartoum, Faculty of Sciences, Department of Physics. October 2012 - December 2017.

References:

- Alnadhief Hamed Ahmed Alfedeel - Assistant Professor at the University of Khartoum

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- Aymen Hamid - Assistant Professor at the University of Khartoum

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