



David Karibe

Curriculum Vitae

"People who are really serious about software should make their own hardware" -Alan Kay

Education

2005–2009 **Bachelor of Science, Physics (Electronics)**, The University of Nairobi, *Second Class Honours, Upper Division*.
Specialized in Applied Microprocessor Technologies and Instrumentation

Experience

Consulting

2018–current **Hardware/Firmware Engineer**, *Justus Technologies*.
Design and implementation of solar power monitoring IoT system using NXP K64F ARM cortex M4 and KW41Z ARM Cortex M0+ wireless controllers.

Responsibilities:

- Design of the embedded systems hardware including modeling and spice simulation, schematic capture, PCB Layout and preparation for manufacturing.
- Hardware testing and troubleshooting using digital meters, logic analyzers and oscilloscopes
- Firmware development in C and register level debugging.
- Agile development process management with version control using git and trello scrum boards
- Preparing BOMs and aiding in procurement of required components for the project
- 3D modeling and printing of product casing

2017–current **Co-founder and Lead Firmware Engineer, Sign-IO.**

Implementation of Bluetooth Low Energy(BLE) hardware and firmware in C using NXP KW41Z chips and Android application BLE integration.

Responsibilities:

- Capturing circuit schematics and designing PCB layouts for BLE embedded systems
- Developing firmware for BLE embedded systems using evaluation boards
- Building prototypes, testing and debugging firmware in the prototypes
- Agile development process management with version control using git and trello scrum boards
- Managing version control repositories for the development team
- Recruiting and training junior firmware developers

Past jobs

2010–2018 **Senior Technologist, UNIVERSITY OF NAIROBI, Physics Department.**

In charge of innovation and research laboratories in the electronics and laser applications thematic sections. Developing content, reviewing and teaching practical units in embedded systems, workshop skills and computer programming.

Responsibilities:

- Designing embedded systems hardware and developing firmware for ARM Cortex-M targets for application in various innovation projects.
- Design and review of embedded systems and workshop skills practical laboratory courses for the department of Physics.
- Teaching and evaluating students in embedded systems, workshop skills and computer programming courses
- Offering technical support to researchers at the department in instrumentation and interfacing problems
- Facilitating and training in the University of Nairobi Solar Academy short course which happens at least twice every year.
- Facilitating and training in the University of Nairobi Electronics Academy short course for corporate at the Physics Department
- Repair, maintenance and development of new research set-ups
- Procurement of new equipment (computers, embedded development Kits and assorted electronics components, microscopic imaging systems)

Vocational

2008 **August Holiday Internship, UNIVERSITY OF NAIROBI, Physics Department, Industrial Electronics Unit.**

Developed an embedded system for farming automation with sensors and actuators.

Detailed achievements:

- Learned and exercised problem solving techniques; brainstorming, problem definition and problem disintegration.
- Circuits design, PCB prototyping and hardware debugging
- Applied Micro-controller programming in C
- Project Documentation

Computer skills

Novice PERL

- Intermediate ASSEMBLY, JAVA, Android platform, HTML/CSS/JAVASCRIPT, Linux admin (Kernel and Userspace system configuration)
- Advanced C/C++ programming, Electronics Systems Modeling and Simulation in systemC, Algorithms design in Matlab/Octave, KiCAD Schematic and PCB Layout Design, EElectronics Spice Modeling and Simulation in ngspice, Documents formating in L^AT_EX, Openscad 3D modeling, PYTHON Programming, GNU/Linux user: building software from source, configuration, hardware interfacing, shell scripting, Git (Version Control and collaboration)

Embedded Development Skills

Software

- Toolchains ARM GNU toolchain: General set-up and configuration, building and debugging firmware. Build automation tools: Writing Makefiles to automate firmware build process
- Debug Severs OpenOCD, USBDM, Jlink and PE-micro: experience of use for debugging ARM targets including Freescale KL Series and ST Microelectronics' microcontrollers
- IDEs Eclipse (CDT and JDT) ,NXP Kinetis Design Studio, NXP MCUXpresso with Kinetis SDK and Android Studio.
- Simulation SystemC, ngspice and Matlab: Used in teaching and research work in post-graduate studies.
- Wireless Nordic NRF24L01+ ISM wireless platform, NxP KW41Z Bluetooth Low Energy Platform paired with an android application.
- Interfacing Research equipment interface to Linux OS including serial ports,usb spectrometers and digital cameras for Matlab platform data acquisition.
- KiCAD EDA Designing Schematics, Spice simulation, PCB layout routing and exporting PCB artwork in Gerber files for manufacturing.

Hardware

- Prototyping PCB prototyping using toner transfer method (double sided boards with rivetted vias) and ordering from professional services OSH Park and JLCPCB
- Testing PCB signal troubleshooting using digital meters, oscilloscopes and logic analyzers
- Debugging JTAG and Serial Wire Debug(SWD with ARM CMSIS-DAP)
- Wireless signal tracing using RF spectrum analyzer (SPECTRAN HF-6060 V4) for antennae testing

Workshop Skills

- 3D Modelling OpenSCAD; precision 3D modelling for 3D printing and visualization models for electronics components to be used in PCB layout 3D inspection
- 3D Printing Using Ultimaker2 printer with Cura slicing tool: For product prototyping; plastic housing for embedded systems boards, optic bench alignment custom and replacement components, new setups for holographic imaging and drone parts for a remote sensing project.

Technical Training

Photovoltaic Systems

- Photovoltaics Trainer PV systems sizing and installation, 2 days at the Physics Department, University of Nairobi
- Tailor-made Training in Photovoltaics PV labs, Grid-tie systems, Roof installation, Special flexible materials with applications on portable devices, 2 weeks at Delf University, Netherlands
- Food and Energy trainer SUNfarming GmbH organized Food and Energy mixed PV systems and green house farming - Systems Design and Implementation - 2 weeks training programme at the North West University of Potchefstroom, South Africa

Languages

- English **Fluent (Speaking, reading and writing)**
- Swahili **Fluent (Speaking, reading and writing)**
- Kikuyu **Native language**

Hobbies

- DIY and Electronics
- Travelling and Photography
- Blogging
- CAD and 3D printing

Referees

- Allela Roy **Software Engineer**, *Intel Corporation*, Machine Learning and IoT.
Phone: +254712893128
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- James Gathu **Technology Integration Specialist**, *Escuela Campo Alegre*, Venezuela.
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- Dr. Justus Simiyu **Physics Lecturer**, *Maasai Mara University*, Physics Department.
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