



David Karibe

Curriculum Vitae

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

Education

- Current **Masters of Science, Physics**, The University of Nairobi, *On-going*.
Microprocessor instrumentation and applied laser Physics
- 2005–2009 **Bachelor of Science, Physics (Electronics)**, The University of Nairobi, *Second Class Honours, Upper Division*.
Specialized in Applied Microprocessor Technologies and Instrumentation

Experience

- 2010–Current **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.
- 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
- 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
- Repair, maintenance and development of new laboratory set-ups
- Procurement of new equipment (computers, embedded development Kits and assorted electronics components, microscopic imaging systems)
- Facilitating and attending conferences and workshops for multispectral imaging under the African Spectral Imaging Network(AFSIN)
- Offering technical support to undergraduate and postgraduate students in embedded systems and applied laser physics projects.

Consulting

- 2016–current **Lead Technical Specialist**, SUNFARMING (K) LTD.
Food and Energy programme trainer(Kenya), Preliminary feasibility studies on large Photo-voltaic(PV) installation sites including GIS mapping, PV systems Design, sizing and projections in PV Sol software, PV systems remote monitoring technologies, General ICT consulting
- 2017–current **Co-founder and Lead Firmware Engineer**, *Sign-IO*.
Implementation of 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
- Building prototypes, testing and debugging firmware in the prototype boards
- Scrum master for the development team
- Managing version control repositories for the development team
- Recruiting and training junior firmware developers

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
- Java programming and implementing a relational database in MySql

Miscellaneous

- 2009–2010 **Web Developer**, *IMAGINE BRANDS*, Nairobi.
Developing dynamic web-interfaces in PHP/MYSQL and implementing blogs using Word-Press, as well as general computer software and hardware maintenance

Computer skills

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

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 MCUExpresso, Mbed online platform, Android Studio: Used them for teaching and projects
- Simulation SystemC, ngspice and Matlab: Used in latest 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 cameras for Matlab platform data acquisition
- KiCAD EDA Designing Schematics, Spice simulation, PCB layout routing and exporting PCB artwork in SVG and Gerber files

Hardware

- Prototyping PCB prototyping using toner transfer method (double sided boards with rivetted vias) and professional services OSH Park and Itead
- Testing PCB signal troubleshooting using digital meters, oscilloscopes and logic analyzers
- Debugging Serial Wire Debug(SWD with ARM CMSIS-DAP) using NXP freedom boards and Tower KITS
- 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, drone parts for a remote sensing project, gears and other components for remote controlled car project

Technical Training

Multispectral Imaging and Remote Sensing

- Remote Sensing Using lasers and telescopes in remote sensing, data analysis in Matlab, 2 Weeks at ICIPE-DUDUVILLE CAMPUS, Kenya (2011)
- Multispectral Imaging Course Digital imaging labs, Fluorescence imaging labs, MRI imaging, Image Processing in Matlab, 3 months at Lund University, Sweden in 2012

Multifunctional Bench Microscope Design of a multispectral bench microscope and Matlab software implementation, 2 weeks at Sally Mbuor, Senegal (2015)

Optical Simulation Matlab modeling and simulation of optical microscopic imaging systems, 2 weeks at University of Ouaga, Burkina Faso, (2017)

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

◦ Blogging

◦ Travelling and Photography

◦ CAD and 3D printing

Referees

Prof. K. Kaduki **Professor of Physics**, *University of Nairobi*, Physics Department.

◦ Phone: +254722396632

◦ email:kaduki@uonbi.ac.ke

Mr. Mjomba **Senior Lecturer**, *University of Nairobi*, Physics Department.

◦ Phone: +254723548528

◦ email:mjomba.sc@gmail.com

Allela Roy **Software Engineer**, *Intel Corporation*, Machine Learning and IoT.

◦ Phone: +254712893128

◦ email:allelaroy@gmail.com

James Gathu **Technology Integration Specialist**, *Escuela Campo Alegre*, Venezuela.

◦ Phone: +584140314601

◦ email:jamesmicwe@gmail.com