Wambui **Karuga**

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Work Experience

BRCK LTD *Nairobi, Kenya*

Embedded Software Engineer *September 2018 - Present*

BRCK LTD is a telecommunications company that provides rugged Wi-Fi routers (SupaBRCKs) for connecting frontier markets to the internet

- Implemented a client network traffic logger in C that utilized connection tracking data in the Linux kernel using the Netfilter subsystem and Netlink sockets, thereby improving the accuracy of reported client metrics in the SupaBRCK's Wi-Fi network.
- Implemented a command line interface using the I2C protocol written in C that allowed interaction with the Power Management Integrated Circuit for the SupaBRCK circuit board.
- Leveraging the OpenWRT toolchains and build system to maintain different versions of the SupaBRCK OpenWRT operating system to provide various functionality and operating modes.
- Writing and maintaining device firmware in C for the MSP430 Texas Instruments microcontroller that provides various low-level functionality of the SupaBRCK such as automatic powering on and off, and power and battery management.
- Implemented a client session logger in C using the Netlink interface with the nl80211 driver to interface with the RTL8821AE Wi-Fi chip to track client connects and disconnects as reported by the Wi-FI chip kernel driver.

BRCK LTD *Nairobi, Kenya*

Software Engineer, Intern *July 2017 - September 2017*

BRCK LTD is a telecommunications company that provides rugged Wi-Fi routers (SupaBRCKs) for connecting frontier markets to the internet

- Implemented a local resource provisioning server for content and software packages that increased the transfer of files during the resource allocation process for SupaBRCKs.
- Leveraged knowledge in the Intel x86-64 architecture, GNU and OpenWRT Makefiles and build systems to compile a PyPy (a Python in Python implementation) binary for the OpenWRT operating system.

Education

Jomo Kenyatta University of Agriculture and Technology *Nairobi, Kenya*

BSc in Mechatronic Engineering graduating with Second Class Honors, Upper Division. *September 2013 - August 2018*

- **Mathematics Coursework:** Calculus, Ordinary and Partial Differential Equations, Numerical Methods.
- **Programming Coursework:** Embedded applications using C, C++, and x86 Assembly language, Control Systems Engineering.
- **Electrical Coursework:** Circuits and Logic Design, Digital Electronics, Microprocessors and Microcontrollers.

Projects and Hackathons

MTX

- MTX is an ongoing implementation of a file explorer designed to sort files according to their frequency of use on each day of the week.
- MTX is developed in C++ and uses the QT framework to write its graphical user interface.

The Transhumeral Prosthetic.

- This is a prosthetic for upper arm amputations implemented as my final year engineering project.
- Utilized the ATmega328p microcontroller and AVR-C to implement an algorithm for actuating a system of eight servo motors for control of the prosthetic.
- Implemented a Python API on a Raspberry Pi 2 that enabled control of the prosthetic using an Android mobile application written in React Native.
- Interfaced the ATmega microcontroller with the Raspberry Pi using serial communication to enable prosthetic control with the Python API.

F8 2019

- Utilized the Messenger platform to develop a Python bot that provided import/export regulations to small business owners to help them expand their businesses.
- Implemented an interface that provided the option of using French or English with the Messenger bot.
- The project was shortlisted as a finalist and won as the best project that addressed the Industry, Innovation and Infrastructure Sustainable Development Goal.

Languages and Technologies

Languages: C, C++, Python, Shell Scripting

Technologies: Git, OpenWRT, MongoDB, GNU Build System