

Wambui Karuga

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Work Experience

BRCK LTD

EMBEDDED SOFTWARE ENGINEER

Nairobi, Kenya

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

SOFTWARE ENGINEER, INTERN

Nairobi, Kenya

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

BSC IN MECHATRONIC ENGINEERING GRADUATING WITH SECOND CLASS HONORS, UPPER DIVISION.

Nairobi, Kenya

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, Mercurial, MongoDB, GNU Build System