Jack Bott

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Summary

Electrical and Mechanical Engineer with experience in software development, ranging from microcontrollers and embedded systems to human user interfaces and server containers for cloud deployments.

Practical knowledge of C, C++, Python, JavaScript/Node.js/React, Linux, TCP/IP, Modbus, Printed Circuit Board (PCB) design, and 3D modeling.

Background includes building reliable hardware and software solutions for harsh environments, as part of a non-profit research group focused on the developing world.

Science and Engineering Experience

The qSEL at the Earth Institute, Columbia University, New York, NY

Embedded Engineer *June 2014 - Present*

Irrigation Detect Project (Presented at IEEE GHTC 2020)

* Led the design, prototyping, and testing of a stereo camera computer vision system for the detection and geolocation of irrigated plots in sub-Saharan Africa. (KiCad, OpenCV, Python, Linux)
* Maintain and update in-house GIS display dashboard for Columbia World Projects. (React, QGIS)

Acacia Irrigation Project (Deployed in Gabar & Mbour, Senegal)

* Designed and implemented PAYGO irrigation systems for smallholder farmers.
* Embedded firmware (C, C++), circuit design and simulation (Eagle CAD, LTspice), local networking and connection to cloud API (Modbus RTU, HTTP), and cloud based web application (Python, JavaScript, Docker, Travis CI) all designed for use in rural arid environments.

SharedSolar Project (Deployed in Isingiro, Uganda)

* Designed, built, and retrofitted offline control hardware and software systems for rural solar mini-grids. (NFC/RFID, Modbus TCP/IP, KiCad, PTC Creo, C, C++)
* Created a cloud based web application to write AES encrypted cards and chart usage. (Docker, Redis, PostgreSQL, Python, JavaScript)

Motor Drives and Power Electronics Lab, Columbia University, New York, NY

MS Student Researcher *Sept 2017 - Dec 2019*

BeagleBone Black PRU Project, Power Inverter Implementation

* Created a real-time motor controller (C) with web app for control and data visualization. (Rust, JavaScript)
* Interface card designed to translate voltage levels from encoders and sensors to motor drive. (Eagle CAD)

CoLiberate, New York, NY

Software Engineer *Sept 2018 - Dec 2019*

Makerspace Access Control System Prototype

* Created a kiosk style application on the Raspberry Pi platform with one other developer. Second generation alpha prototype for access control in shared workspaces. (React, Redux, Node.js, Python, balenaOS)

Education

MS Electrical Engineering Columbia University, New York, NY *May 2019*

BA Physics Bard College / BS Mechanical Engineering Columbia University *May 2014*

Dual Bachelor of Science and Bachelor of Arts Program
Bard College, Distinguished Scientist / The Fu Foundation School of Engineering and Applied Science