Jack Bott

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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

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 GHTC 2020)

* Lead 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, Python, Linux)

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

* Lead the development of PAYGO irrigation systems for smallholder farmers, USAID and OFID funded.
* Designed PCBs using Eagle CAD, circuit simulation with LTspice, and mounting parts drawn in FreeCAD.
* Developed firmware in C and C++ for embedded controllers to interface VFDs over Modbus with SIMCom cellular modems. The modems connect with a cloud API using HTTP and MQTT protocols.
* Created a cloud based web application to aggregate measurements and control the state of IOT enabled pump controllers. Used Flask and uWSGI for Python based app, Docker to containerize the project, Let's Encrypt free SSL certificates, and Travis CI for continuous integration and testing.

SharedSolar Project (Deployed in Isingiro, Uganda)

* Designed, built, and retrofitted control hardware and software systems for rural solar mini-grids.
* Maintained twelve systems in Uganda for several years until present with local team under my supervision.
* Offline NFC/RFID payment system developed to connect with Modbus TCP/IP components. (C & C++)
* Mounting parts designed in PTC Creo and custom PCBs drawn in Eagle CAD.
* Created cloud web application to write AES encrypted cards and chart usage. Containerized with Docker, Redis and PostgreSQL used for data storage, Python and Tornado on the backend, Vanilla JavaScript and SockJS on the frontend.

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

* Real-time motor controller written in functional C for TI's proprietary C compiler.
* Rust web server made with Rocket using D3 JavaScript library to visualize measured data.
* Interface card designed in Eagle CAD to translate voltage levels from encoders and sensors to motor drive.

CoLiberate, New York, NY

Software Engineer *Sept 2018 - Dec 2019*

Makerspace Access Control System Prototype

* Created kiosk style application on Raspberry Pi platform with one other developer. Second generation alpha prototype for access control in shared workspaces.
* React and Redux on a Node.js frontend and as Sanic on a Python backend. All running within a balenaOS Docker container for easy updating and maintenance.