COLE BROOKS

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PROFESSIONAL PROFILE

Full stack developer with 4 years of experience designing and building embedded systems, cross-platform applications, and secure cloud infrastructure for FDA regulated medical devices. Proven track record in cross-disciplinary engineering, DevOps, and technical leadership.

EDUCATION

Montana State University *November 2022*
B.S. in Computer Science

EXPERIENCE

Titin KM Biomedical October 2021 - Present
Full Stack Developer, Network Administrator *Bozeman, MT*

- Developed novel cross platform medical device interface using Python and Kivy, facilitating data collection and analysis, and improving user interaction and reliability.
- Architected and maintained embedded firmware in C++ for real time biometric strength and range of motion application and measurement.
- Implemented a secure, HIPAA compliant backend using AWS (Lambda, S3, EC2) with Python and PostgreSQL, enabling scalable communication with and control of IoT devices.
- Designed zero touch IoT device bootstrap tooling with Ubuntu cloud-init and AWS IoT Core and Greengrass.
- Designed robust custom wiring harnesses for embedded medical devices, enabling reliable signal and power delivery in harsh conditions; incorporated strain relief, EMI shielding, and compliance with FCC medical device safety standards.
- Designed, deployed, and maintained secure networking infrastructure aligning with HIPAA requirements.
- Collaborated with mechanical and regulatory teams to ensure FDA Class II device compliance.

SELECTED PROJECTS

IoT Bootstrap Tooling - Designed and implemented a zero-touch, minimal privilege bootstrap toolchain for the production team to deploy new devices to the cloud IoT infrastructure. Built with portability and extensibility in mind using cloud-init, shell scripts, and systemd to configure Ubuntu and install AWS IoT Greengrass runtime.

Web Based Ski Route Map - Developed an interactive map of the Bridger Bowl ski area known for its plethora of unmarked expert trails. Built on Vue.js using the CesiumJS geospatial visualization library.

Gas Gauge Style UI Element - Implemented a reusable, radial style UI element in vanilla Matplotlib in order to effectively and elegantly convey rehab progression to patients and providers.

Python MVVM Architecture - Architected and implemented a reusable, event-driven MVVM interface for RESTful Python applications.

Cloud Hosted Firmware OTA Pipeline - Designed and implemented a firmware OTA update pipeline in which firmware binaries are automatically fetched from AWS S3 and sent to the ESP32 based microcontroller after verification.

TECHNICAL STRENGTHS

Programming Languages	Python, C, C++, Bash
Frontend	Kivy, Vue.js, Matplotlib
Backend	FastAPI, PostgreSQL, SQLAlchemy
Cloud	AWS, CloudFormation, IOT Core, VPC
IT	pfSense, Active Directory, VMware
Electrical	Oscilloscope, Soldering, Wiring Harness Design, PCB Modification
Regulatory	HIPAA, FCC, FDA
Miscellaneous	LaTeX

ADDITIONAL ACTIVITIES

Contribution to Kivy - Updated the Kivy project's Emacs mode to improve syntax highlighting.

Contribution to GhettoVCB - GhettoVCB is an open source VMWare virtual machine backup tool. Provided a bugfix to address broken snapshots of thick provisioned, zeroed disks in VMWare.