Below, you can find the details of most (if not all) of my projects. Thanks for visiting!

Resume // Email // LinkedIn

All My Past & Current Projects

Personal Projects

Running DOOM (and Snake) on the DE1-SoC

Source code:

- FPGA modules for DOOM and Snake, and C++ source code for Snake
- C DOOM source code

Summary:

- Modified the original DOOM source code (in C) to be compilable on the DE1-SoC's ARM Cortex A9 processor
- Loaded a Linux kernel onto the DE1-SoC and constructed a loadable kernel module to reserve memory space on the CPU for shared access w/ FPGA
- Developed SystemVerilog FPGA modules to carry out hardware-accelerated graphics rendering functions via CPU shared memory
- Added functionality to custom-ported DOOM code to take advantage of these hardware-accelerated FPGA modules
- Integrated FPGA system with Intel Quartus' Platform Designer for modularized, swappable design
- Debugged the system at integration time with GNU GDB (CPU side) and Intel Signal Tap logic analyzer (FPGA side)

Python Typing Game with a GUI, Scores, and Live Feedback

- Built a live-responding graphical typing game to expand Python knowledge and exercise programming best practices
- Leveraged TkInter library knowledge to construct an efficient, responsive GUI for the typing game
- Designed optimized algorithms to compute and display user statistics in real time without consuming significant system resources
- Employed unit tests, virtual environments, and Docstrings to ensure code correctness, readability, and changeability

FORM Swim Projects

At form, I worked with the Software QA team to continuously test & validate FORM's embedded firmware and mobile software. More interestingly, I proposed and led the development of an internal tool -- QA Terminal.

Sorry, the source code for this project is not available.

QA Terminal

- Led the development of this Python-based GUI application to combine 10+ critical testing functions and accelerate testing
- Demonstrated a passion for learning by independently mastering 4 new BLE, GUI, and cloud libraries to innovate new functionality
- Developed a proprietary Bluetooth Low-Energy (BLE) Python API for FORM devices to facilitate remote control & file transfer
- Leveraged AWS services and embedded C++ utilities to enable rapid firmware deployment and verification
- Optimized and increased USB-Serial data processing speed by 80% (compared to previous tools) to enable faster insights