Tucker J. Polomik

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Experience

- **INFICON** — Syracuse, NY
  R&D Software Engineer — *October 2018 - Present*
  - **R&D**: Software Engineer working as part of a multidisciplinary, agile team doing R&D work in the areas of gas chromatography, mass spectrometry, thin film deposition and vacuum technologies targeting the semiconductor and defense industries.
  - **Software Engineer**: Full-stack responsibilities ranging from front-end web development to bare-metal assembly code, and everything in between. Custom Linux kernel modules, board bring-up, multi-threaded application level programs, custom network layers on top of TCP/IP, FPGA interfacing, and circuit design & debugging.
  - **Data Processing**: Responsible for implementing user-configurable post-processing events on the Flask back-end on a gas chromatograph. Allows end-users to modify erroneous chromatography results through a web interface.
  - **FPGA Registers Over HTTP**: Expose FPGA registers as dynamic REST endpoints on a cpprestsdk web server for rapid debugging. Removed the need for bloated FPGA tooling software/hardware. FPGA memory map addressable by URI of GET/PUT/POST requests.
  - **Linux Kernel Modules I**: Wrote a char device kernel module to deprecate ISA DMA functionality as an electrometer data pipe in a GC/MS, allowing INFICON to avoid buying a price-gouged legacy board, saving the company upwards of $750,000. This earned me the nickname "Million Buck Tuck".
  - **Linux Kernel Modules II**: Wrote a TTY line discipline driver to allow message multiplexing to a USB-to-serial device from another TTY, transparent to userspace applications.
  - **Project Planning**: Participate in various stages of project planning including voice of customer, requirements drafting, phase-gate work breakdown and FMEAs.
- **KGB AVIATION SOLUTIONS, LLC.** — West Seneca, NY
  Student Embedded Engineer — *January 2018 - May 2018*
  - **FDR Interfacing Tool**: Worked with the company CEO and several other interns to build an interfacing system for flight data recorders (FDRs).
  - **Reverse Engineering**: Sniffed an RS-422 bus to determine propriety hand-shaking signals.
  - **FTDI**: Interfaced to a FTDI USB to serial chip from a Pine64 SBC to mock hand-shaking signals to flight data recorders, allowing data extraction. Concurrently update a GUI over MIPI DSI.
  - **Shipped Product**: Managed to take an idea from the planning stages and progress to a tangible, secure, shippable embedded system in four months time.

Personal Projects

- **Chip8**: Wrote an interpreter for the Chip8 language targeting Linux, Windows and wasm. Capable of playing Chip8 ROMs. C++, SDL2.
- **Pongloader**: x86 assembly pong game that fits in a legacy boot sector.
- **MicroSpaceInvaders**: ASCII rendition of the 1978 arcade game written in ARM7 assembly language and C. Developed on bare-metal NXP LPC213x series of ARM microprocessor boards. Programmed and debugged over J-link JTAG.

Programming & Tooling

- **Languages**: C++, C, Python, JavaScript, VHDL, x86 and ARM assembly.
- **Tools & Frameworks**: GNU Toolchain, CMake, git, Yocto
- **OS/Platforms**: Linux, Windows, FreeRTOS, Bare-metal.
- **Hardware**: Comfortable reading schematics & using oscilloscopes, logic analyzers, multi-meters, etc.

Education

- **University at Buffalo, School of Engineering** — Buffalo, NY
  Bachelor of Science, Computer Engineering — *Awarded September 2018*
- **Linux Foundation** — Syracuse, NY
  Linux Foundation Certified Engineer - Linux Kernel Internals — *Awarded December 2019*