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 cross-functional team doing R&D work in the areas of gas chromatography, mass spectrometry, thin film deposition and vacuum leak detection.
  - **Data Processing**: Responsible for implementing user-configurable post-processing events on the Flask back-end of one of our instruments. 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.
  - **Event Queue**: Hand-rolled an asynchronous event queue & task scheduler in C++ to multiplex thread-wise access to singletons by priority and prevent threads from preempting one another, which previously lead to undefined behavior & raced data.
  - **Internal Tooling**: Wrote various internal tools for rapid instrument debugging & data visualization in Python & JavaScript.
  - **Linux Device Drivers**: Forward-ported ISA DMA & multidrop RS-485 device drivers from kernel version 2.6 to 4.15. Proved out a feasibility study allowing INFICON to avoid a price-gouged last time buy of an obsolete board, saving upwards of $750,000, earning me the nickname "Million Buck Tuck".
  - **DSP Programming**: Wrote SHARC assembly code for Analog Devices DSP chips. Automated the compiling, linking, splitting & binary deployment process on an internal build server to streamline DSP programming for other engineers.
- **KGB AVIATION SOLUTIONS, LLC.** — West Seneca, NY
  Student 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**: Determined the proprietary handshaking protocol & RS-422 signal timing patterns of FDRs by sniffing the 422 bus.
  - **FTDI**: Wrote a multi-threaded Python script which used pylibftdi to mock the hand-shaking signals expected by the flight data recorders to extract data from them, while updating a GUI on a MIPI display concurrently.
  - **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. Capable of playing Chip8 ROMs. C++, SDL2.
- **Pongloader**: x86 bootloader that makes you win a game of pong before going to your OS. x86 asm.
- **Carduino**: Write C code on an ATmega328P chip that controls servos and motors on an RC vehicle. Concurrently parse data from an ultrasonic sensor to calculate the vehicle's distance to things around it, changing the angle of the servos to avoid collisions accordingly.
- **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 over J-link JTAG.

Programming & Tooling

- **Languages**: C++, C, Python, Java, JavaScript, VHDL, assembly for various instruction sets.
- **Tools & Frameworks**: GNU Toolchain, CMake, git, Quartus, Vivado, Keil μVision, 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*