

# Tucker J. Polomik

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## EXPERIENCE

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- **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.
  - **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 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. FPGA memory map addressable by URI of GET/PUT/POST requests.
  - **Linux Device Drivers:** 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".
  - **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:** 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

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- **Chip8:** Wrote an interpreter for the Chip8 language. 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

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- **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

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- **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*