EDUCATION University of Texas at San Antonio - San Antonio, TX

Spring 2017 - Fall 2017 3.1 GPA

B.S. Computer Science

Rochester Institute of Technology - Rochester, NY

Fall 2012 - Spring 2016

Computer Science

EXPERIENCE

Raytheon - San Antonio, TX

August 2016 - Present

Vulnerability Researcher & Software Engineer

https://www.raytheon.com/

Analyzed various programs and consumer electronics for vulnerabilities, finding several that allow for remote code execution. Patched QEMU for reduced VM detection by guests. Added support for various Intel features to a hardware-accelerated state-of-the-art virtual machine.

Delphix - San Francisco, CA

June 2016 - August 2016

Software Engineer Intern

https://www.delphix.com/

Made improvements to the Unix filesystem mounting abstractions used by the core Delphix product. Worked with a large team of programmers independently making changes to the same project.

Janssen Biotech - Spring House, PA

June 2015 - January 2016

Software Engineer Intern

https://www.janssen.com/

Developed tooling and services for generating visualizations of tabular data sets, written predominantly in Haskell. Such datasets were often many gigabytes in size and so careful optimization was often necessary.

ShoreTel - Rochester, NY

June 2014 - December 2014

Software Engineer Intern

https://www.shoretel.com/

Developed an HTTP load tester for slow internal services. Exposed particularly inefficent access patterns.

LANGUAGES

C, C++, Haskell, x86 Assembly, Erlang, Python, Coq, Verilog (In decreasing order of proficiency)

Projects

pcf-font

https://github.com/michael-swan/pcf-font

Implemented a Haskell library for parsing and rendering X11 PCF fonts, which was later used for other projects involving text rendering with OpenGL and a font texture atlas.

Causal Commutative Arrow

 $\verb|https://github.com/michael-swan/CausalCommutativeArrows|$

Wrote a mechanized proof in Coq of rewrite rules used for CCA optimization as described in the 2011 paper by Liu, Cheng, and Hudak.

Gameboy VGA Module

https://github.com/michael-swan/Gameboy-RGB

Developed an FPGA device which converts video output from the classic Gameboy main board into a standard VGA output video signal.

NES Controller Serial-to-Parallel https://github.com/michael-swan/NES-Controller-SIPO Created a module which converts serial data from NES controllers into a parallel bus for which separate wires correspond to separate buttons on the controller.

ProtectExec

https://github.com/michael-swan/ProtectExec

Developed a simplified container system by configuring Linux control groups, namespaces, and chroot features in a simple C library.

Hardware Pong

https://github.com/michael-swan/Pong

Implemented classic Pong on an FPGA with VGA output, written in Verilog.

SSH Honey Pot

https://github.com/michael-swan/HoneyPot

Developed a simple SSH Honey Pot in Erlang.