

Paul Crews

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EDUCATION

Stanford University

Stanford, CA

- *Bachelor of Science in Computer Science* *Sept. 2014 - June 2018 (Expected)*
Master of Science in Computer Science *Jan. 2018 - June 2019 (Expected)*
 - **Relevant Courses:** Operating and embedded systems, compilers, computer and network security, algorithmic analysis, databases, distributed systems, parallel programming, probability, and linear algebra.

EXPERIENCE

TockOS Project, Stanford University

Stanford, CA

- *Undergraduate Researcher* *March 2017 - Present*
 - **6LoWPAN:** Implemented 6LoWPAN compression, decompression, and fragmentation, bringing IPv6 networking over low-power wireless links to the Tock platform, substantially increasing the viability of the system.
 - **SOSP Tutorial:** Helped to present the TockOS tutorial at SOSP 2017, which provided an opportunity to introduce conference attendees to the Tock platform and how to develop on it.
 - **SPI:** Extended the existing Serial Peripheral Interface (SPI) codebase to support running Tock as an SPI Slave device, enabling the use of Tock with peripherals that operate only in SPI Master mode.
 - **Testing:** Developed a comprehensive testing suite for the Tock networking stack. This resulted in the discovery of several timing-related race conditions in the radio software, further stabilizing the platform.

The Raytheon Company

Melbourne, FL

- *Vulnerability Researcher Intern* *June 2016 - Sept 2016*
 - **Static Analysis:** Utilized industry-standard static analysis and reversing tools to understand the high-level control flow for the hypervisor, resulting in the ability to interject arbitrary hypercalls to the hypervisor.
 - **Dynamic Analysis:** Developed custom drivers for Windows and Linux that issued arbitrary hypercalls, and utilized these drivers to produce an extensible fuzzing library for crash generation.
 - **Technical Report:** Synthesized the results of the dynamic and static analyses to produce a white paper detailing the high-level operation of the platform, the feasibility of exploiting it, and the most viable avenues for further research. This document was used as a roadmap for further work on the project.

EXTRACURRICULAR ORGANIZATIONS

Applied Cybersecurity Club

Stanford, CA

- *Club Leader, Developer* *Oct 2015 - Present*
 - **Leadership:** Responsible for organizing and leading workshops, technical demonstrations, and competition trainings. Focused on teaching both high-level security concepts and analyzing real-world security vulnerabilities.
 - **Projects:** Led a group of club members interested in development related to computer security. Projects include fuzzer development, exploit writing, and security tool development.
 - **Competitions:** Participated in several collegiate computer security competitions, both as part of an offensive team (CPTC) and as a defensive team (CCDC). Placed first in the 2017 CPTC competition.

PROJECTS

- **Firewall Ruleset Analysis:** Leading a group developing a static analysis tool for complex firewall rules. This program is designed to discover conflicting or misconfigured rules, and construct a reachability graph statically.
- **Water Quality Sensor Project:** Developed a low-power, autonomous water quality sensor platform, designed to periodically send measurements over a GSM connection.

PROGRAMMING SKILLS

- **Languages:** C, C++, Python, Rust, Go **Technologies:** Git, GDB, Valgrind, CUDA, x86, ARM