

Daniel Bittman

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Education

University of California, Santa Cruz

July 2016 - Present

Ph.D., Department of Computer Science

Adviser: Ethan Miller

Current - Ph.D. Student

University of California, Santa Cruz

September 2011 - June 2016

- *Bachelor of Science, Computer Science*. Participated in research, resulting in publication and thesis. Thesis: Designing a Wait-free MPSC Queue For Use in SeaOS.
- *Bachelor of Science, Physics*. Thesis: Solving Boundary Value Problems Efficiently Using Computers.

Research Experience

Storage Systems Research Center, UC Santa Cruz

July 2016 - Present

Graduate Student Researcher. PI: Ethan Miller

- Twizzler: Designed and implemented an operating system designed for byte-addressable non-volatile memory, including kernel and user-level system design and implementation.
- Sub-process Fault Isolation: Designed and implemented a shared library for Linux that provides isolation and separation between libraries within a process, with total transparency to the application and an unmodified kernel. The purpose of this project was to explore the problems with this approach in order to determine the minimum support required for such isolation and security guarantees.

Disorderly Labs, UC Santa Cruz

January 2017 - Present

Graduate Student Researcher. PI: Peter Alvaro

- System-level Provenance Collection: Designed a system which used systemcall interposition to capture provenance information within an application in a distributed system.

Storage Systems Research Center, UCSC

January 2013 - June 2016

Undergraduate Student Researcher. PI: Darrell Long. Work under DJ Capelis.

- SeaOS: Designed and developed an operating system intended for future use in research projects. The primary designed goals were simplicity and understandability, thus facilitating proof-of-concept implementations of research ideas.

Working-group on Applied Security and Privacy, UCSC

January 2013 - June 2016

Undergraduate Student Researcher. PI: Darrell Long. Work under DJ Capelis.

- VM monitor breakout: Implemented and tested an exploit for a virtual machine security monitor which used Intel's VT-x and trusted CR3 features to perform introspection on an untrusted machine. We showed that their design allowed a compromised kernel to craft a delayed interrupt which allowed jumping to an arbitrary location in the security monitor's code.

Publications

"Twizzler: The Design and Implementation of a NVM Aware OS." Matt Bryson, [Daniel Bittman](#), Darrell Long, Ethan Miller. 2017 Non-volatile Memories Workshop, UCSD. March 13th, 2017.

"The Hypervisor Exploit I Sat on for Five Years." DJ Capelis, Daniel Bittman. International Journal of PoC||GTFO. June 20th, 2015.

"Introducing SeaOS." [Daniel Bittman](#), DJ Capelis, Darrell Long. Information Science and Applications (ICISA), 2014. May 5th, 2014.

Presentations

"Twizzler: The Design and Implementation of a Non-volatile memory aware OS." Matt Bryson, [Daniel Bittman](#), Ethan Miller, Darrell Long. 8th Non-volatile Memories Workshop. UC San Diego. March 13th, 2017.

"SeaOS: A Simple OS for Multicore Machines." [Daniel Bittman](#). Vail Computer Elements Workshop. Vail, CO. June 2017.