

Austen Thomas Barker

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Computer science researcher and programmer specializing in security, operating systems, and storage who likes to break things and then figure out how to fix them.

RESEARCH INTERESTS

Computer security, steganography, operating systems, kernel development, deniable systems, operating systems, flash storage and nonvolatile memory, storage systems, and cryptography.

ACADEMIC BACKGROUND

Ph.D. Computer Science 2018-2022
[University of California, Santa Cruz](#) (UCSC), Santa Cruz, California

- Ph.D. research in computer science focusing on storage systems and security under the direction of Professor Darrell D. E. Long.
- Dissertation: *Artifice: A Design for Usable Deniable Storage Informed by Adversary Threat*

M.S. Computer Science 2017-2018
[University of California, Santa Cruz](#), Santa Cruz, California

- Focused on storage and security.
- Masters Project: *Artifice: A Deniable Steganographic Storage System*

B.S. Computer Science 2013-2017
[University of California, Santa Cruz](#), Santa Cruz, California

EMPLOYMENT HISTORY

Graduate Student Researcher March 2018 - Present
[University of California, Santa Cruz](#), [Storage Systems Research Center](#), Santa Cruz, California

- Graduate Student Researcher in the UCSC Storage Systems Research Center (SSRC/CRSS).
- Currently working on [Artifice](#), a deniable steganographic storage system and [Lethe](#), an efficient cryptographic secure deletions system designed for use with file systems or key-value stores.

Teaching Assistant January - March 2018, September - December 2019
[University of California, Santa Cruz](#), [Storage Systems Research Center](#), Santa Cruz, California

- TA for the penultimate offering of UCSC's Introduction to Operating Systems, [CMPS-111](#), in the winter quarter of 2018. 30 students.
- Assisted in developing curriculum and TA'd for the first offering of a new lower division class, Computer Systems and C Programming, [CSE-13S](#), in the fall quarter of 2019. 35 students.

Information Security Intern July - December 2017, June - September 2018
[DataStax](#), Santa Clara, California

- Designed and implemented a prototype single sign-on authentication API, database interfaces (AWS RDS and Apache Cassandra), and password handling utilities in Go for a SAAS database platform.

- Secure cloud systems setup and hardening automation. Security focused VPC log analytics API and web visualizations.

Software Engineering Intern June - September 2016
 TidalScale Inc., Los Gatos, California

- Software engineering summer internship. Also worked over the 2016 winter break between school terms.
- Ubuntu certification testing for a software defined server appliance.
- Wrote a Python administration and monitoring utility for a distributed hypervisor. Collected metrics from multiple machines in a distributed system, stored them in a small time series database, and displayed using an ncurses interface.

Software Engineering Intern June - September 2014, June - September 2015
 Immediate Insight, Los Altos, California

- Supported the deployment of an IT data analytics tool within Kaiser Permanente's IT infrastructure.
- Installation, capacity, and operational testing of an IT data analytics platform built using Node.JS and Elasticsearch.

SPECIAL ACHIEVEMENTS *Awards*

- *Eagle Scout* Boy Scouts of America, Troop 30, Los Altos, California, 2012

Grants

- *NSF Award* Artifice research funded by NSF award #1814347 CSR Small: A Multi-layered Deniable Steganographic File System under P.I. Prof. Darrell D. E. Long.

SKILLS

Programming Languages

C, C++, Python, Go, Java, LaTeX, and Lisp/Scheme.

Technologies and Systems Proficiencies

FreeBSD, Linux, Windows, Git, Docker

PUBLICATIONS

1. Kyle Fredrickson, Austen Barker, Darrell D. E. Long, "A Multiple Snapshot Attack on Deniable Storage Systems," *Proceedings of the 29th International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS '21)*, November 2021, pp. 1-8.
2. Austen Barker, Yash Gupta, James Hughes, Ethan L. Miller, Darrell D. E. Long, "Rethinking the Adversary and Operational Characteristics of Deniable Storage," *Journal of Surveillance, Security, and Safety (JSSS)*, 2021;2;42-65.
3. Austen Barker, Yash Gupta, Sabrina Au, Eugene Chou, Ethan L. Miller, Darrell D. E. Long, "Artifice: Data in Disguise," *Proceedings of the 36th International Conference on Massive Storage Systems and Technology (MSST '20)*, October 2020.
4. Austen Barker, Staunton Sample, Yash Gupta, Ana McTaggart, Ethan L. Miller, Darrell D. E. Long, "Artifice: A Deniable Steganographic File System," *Proceedings of the 9th USENIX Workshop on Free and Open Communications on the Internet (FOCI '19)*, August 2019.