Eric D. Gustafson

SECURITY RESEARCHER · SECURITY ENGINEER

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Education

University of California, Santa Barbara   *Santa Barbara, CA*

PH.D. IN COMPUTER SCIENCE   *Sep. 2014 - Jun. 2020 (expected)*

University of California, Davis   *Davis, CA*

M.S. IN COMPUTER SCIENCE   *Sep. 2012 - Jun. 2014*

California Polytechnic State University, San Luis Obispo   *San Luis Obispo, CA*

B.S. IN COMPUTER SCIENCE   *Sep. 2007 - Dec. 2011*

Work Experience

Sandia National Laboratories   *Livermore, CA and Santa Barbara, CA*

CENTER FOR CYBER DEFENDERS INTERN   *Jun. 2013 - present*
- Developed a scalable Android app analysis platform using the open-source Minimega cluster framework
- Created a testbed and testing methodology for enabling wire-speed deep packet inspection applications at extremely high throughput
- Research into enabling the analysis of embedded firmware

NASA Jet Propulsion Laboratory   *Pasadena, CA*

CYBERSECURITY OPERATIONS AND ENGINEERING INTERN   *Jun. 2006 - Jun. 2012*
- Designed, built, and maintained a scalable intrusion detection and packet-capture system for the lab's network
- Supported the Cybersecurity Operations team's incident response, forsensics, and software review activities

Publications

HALucinator: Firmware Re-hosting Through Abstraction Layer Emulation   *Proceedings of the 29th USENIX Security Symposium (USENIX '20)*

ABRAHAM CLEMENTS AND ERIC GUSTAFSON, TOBIAS SCHARNOWSKI, PAUL GROSEN, DAVID FRITZ, CHRISTOPHER KRUEGEL, GIOVANNI VIGNA, SAURABH BAGCHI, MATHIAS PAYER   *August, 2020*

Toward the Analysis of Embedded Firmware through Automated Re-hosting   *Proceedings of the 22nd International Symposeum on Research in Attacks, Intrusions, and Defenses (RAID '19)*

ERIC GUSTAFSON, MARIUS MUENCH, CHAD SPENSKY, NILO REDINI, ARAVIND MACHIRY, YANICK FRATANTONIO, AURELIEN FRANCILLON, DAVIDE BALZAROTTI, YUNG RYN CHOE, CHRISTOPHER KRUEGEL, GIOVANNI VIGNA   *Sep. 2019*

Think Outside the Dataset: Finding Fraudulent Reviews using Cross-Dataset Analysis   *Proceedings of the 2019 World Wide Web Conference (WWW '19)*

SHIRIN NILIZADEH, HOJJAT AGHAKHANI, ERIC GUSTAFSON, CHRISTOPHER KRUEGEL, AND GIOVANNI VIGNA   *May. 2019*

Towards Automatically Generating a Sound and Complete Dataset for Evaluating Static Analysis Tools   *Proceedings of the NDSS Workshop of Binary Analysis Research (BAR '19)*

MACHIRY, ARAVIND, NILO REDINI, ERIC GUSTAFSON, HOJJAT AGHAKHANI, CHRISTOPHER KRUEGEL, AND GIOVANNI VIGNA   *Feb. 2019*

Using Loops For Malware Classification Resilient to Feature-unaware Perturbations

MACHIRY ARAVIND, NILO REDINI, **ERIC GUSTAFSON**, YANICK FRATANTONIO, YUNG RYN CHOE, CHRISTOPHER KRUEGEL, AND GIOVANNI VIGNA

Proceedings of the Annual Computer Security Applications Conference (ACSAC '2018)

Dec. 2018

Exploitation and Mitigation of Authentication Schemes Based on Device-Public Information

ANTONIO BIANCHI, **ERIC GUSTAFSON**, YANICK FRATANTONIO, CHRISTOPHER KRUEGEL, GIOVANNI VIGNA

Proceedings of the Annual Computer Security Applications Conference (ACSAC '2017)

Dec. 2017

Shell We Play A Game? CTF-as-a-service for Security Education

ERIK TRICKEL, FRANCESCO DISPERATI, **ERIC GUSTAFSON**, FAEZEH KALANTARI, MIKE MABEY, NAVEEN TIWARI, YEGANEH SAFAEI, ADAM DOUPÉ, GIOVANNI VIGNA

Proceedings of the 2017 USENIX Workshop on Advances in Security Education (ASE '17)

Aug. 2017

BootStomp: On the Security of Bootloaders in Mobile Devices

NILO REDINI, ARAVIND MACHIRY, DIPANJAN DAS, YANICK FRATANTONIO, ANTONIO BIANCHI, **ERIC GUSTAFSON**, YAN SHOSHITAISHVILI, CHRISTOPHER KRUEGEL, AND GIOVANNI VIGNA

Proceedings of the 26th USENIX Security Symposium (USENIX Security '17)

Aug. 2017

BOOMERANG: Exploiting the Semantic Gap in Trusted Execution Environments

ARAVIND MACHIRY, **ERIC GUSTAFSON**, CHAD SPENSKY, CHRIS SALLS, NICK STEPHENS, RUOYU WANG, ANTONIO BIANCHI, YUNG RYN CHOE, CHRISTOPHER KRUEGEL, GIOVANNI VIGNA

Proceedings of the Network and Distributed System Security Symposium

Feb. 2017

Andlantis: Large-scale Android dynamic analysis

MICHAEL BIERMA, **ERIC GUSTAFSON**, JEREMY ERICKSON, DAVID FRITZ, YUNG RYN CHOE

Proceedings of the 2014 Workshop on Mobile Security Technologies (MoST '14)

May 2014

Quantifying the Effects of Removing Permissions from Android Applications

KRISTIN KENNEDY, **ERIC GUSTAFSON**, HAO CHEN

Proceedings of the 2013 Workshop on Mobile Security Technologies (MoST '13)

May 2013

Presentations

IEEE Conference on Control Technology and Applications (CCTA) Internet of Threats Workshop

KEYNOTE SPEAKER, "ARE WE DOOMED? THE STATE OF FIRMWARE ANALYSIS (AND WHAT WE CAN DO ABOUT IT)"

Copenhagen, Denmark

Aug. 2018

Honors & Awards

April 2016 **Global Winner, Best Use of Data Category (w/ Team Scintilla)**, NASA Space Apps Challenge

2013 **Google Lime Scholarship Recipient**,

2014-2015 **JL Moore Doctoral Fellowship Recipient**,

Skills

Reverse Engineering	Firmware, Android applications, binary programs
Programming	Python, C, ASM, LaTeX, Java
DevOps	AWS, Docker, Kubernetes, Ansible
Back-end	Django, Flask,

Extracurricular Activity

Shellpish, competitive hacking team *Santa Barbara, CA*

CORE MEMBER *Sep. 2014 - present*

- Gained expertise in reverse-engineering, cryptography, and web security.
- Participated in numerous Capture-the-Flag (CTF) contests, including the DEF CON CTF world championships from 2015-2019
- Supported the engineering and organization of the 2015-2019 editions of the UCSB/Shellphish iCTF contest
- Won the 2019 CSAW Embedded Security Challenge using technologies developed during my dissertation research

Cal Poly White Hat Cybersecurity Club *San Luis Obispo, CA*

PRESIDENT *Sep. 2010 - Jun. 2010*

- Oversaw the initial growth of the club, from a few dozen to hundreds of members
- Created a student-run security lab on campus, to facilitate hands-on learning outside of the classroom, the only lab of its kind at Cal Poly
- Organized the first major corporate sponsorships of White Hat