

Curriculum Vitae

Zachary N. J. Peterson

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Current Position

Associate Professor, Department of Computer Science and Software Engineering, Cal Poly, San Luis Obispo, CA

Interests

Cybersecurity Education, Secure Storage Systems, Applied Cryptography

Education

- PhD 2006 The Johns Hopkins University, Computer Science
Dissertation: Toward Regulatory Compliant Storage Systems
Research: Federally compliant storage systems employing cryptography, file system versioning, secure deletion, and authentic provenance data.
Advisor: Professor Randal Burns
- MS 2005 The Johns Hopkins University Information Security Institute, Security Informatics
Project: Secure Deletion for a Versioning File System
Research: Electronic record and content management policy, digital rights, intellectual property, and privacy issues.
Advisors: Professor Gerry Masson and Professor Aviel D. Rubin
- MS 2002 University of California, Santa Cruz, Computer Science
Thesis: Data Placement for Copy-on-Write Using Virtual Contiguity
Research: Data placement and allocation policies, MEMS-based storage.
Advisor: Professor Darrell D. E. Long
- BS 2000 University of California, Santa Cruz, Computer Engineering
Liberal arts emphasis in music.

Employment History

- 2018– **WhiteFox Defense, Inc.**, *Head of Autonomous Vehicle Security*, San Luis Obispo, CA.
- 2016– **Cal Poly, San Luis Obispo**, *Associate Professor*, Computer Science, San Luis Obispo, CA.
- 2016 **University College London**, *Honorary Senior Lecturer*, Computer Science, London, England.
- 2013–16 **Cal Poly, San Luis Obispo**, *Assistant Professor*, Computer Science, San Luis Obispo, CA.
- 2013 **California State University, Monterey Bay**, *Lecturer*, Monterey, CA.
- 2010–13 **Naval Postgraduate School**, *Assistant Professor*, Computer Science, Monterey, CA.
- 2008–10 **The Johns Hopkins University**, *Assistant Research Scientist*, Computer Science, Baltimore, MD.
- 2006–10 **Independent Security Evaluators**, *Senior Security Analyst*, Baltimore, MD.
- 2008 **McDaniel College**, *Adjunct Lecturer*, Mathematics and Computer Science, Westminster, MD.
- 2002–06 **The Johns Hopkins University**, *Graduate Researcher*, Hopkins Storage Systems Lab, Baltimore, MD.

Select Publications

Journals

1. P. Pusey, M. Gondree, and Z. Peterson. The Outcomes of Cybersecurity Competitions and the Implications for Underrepresented Populations. *IEEE Security & Privacy*, 14(6), pp. 90-95, November-December 2016.
2. M. Gondree, Z.N.J. Peterson, and P. Pusey. Talking about Talking about Cybersecurity Games. *USENIX ;login:*, 41(1), pp. 36-39, Spring 2016.
3. M. Gondree, Z.N.J. Peterson, T. Denning. Security through Play. *IEEE Security & Privacy*, 11(3), 2013.

Refereed Conferences & Workshops

1. M. Zinkus*, O. Curry*, M. Moore*, Z. Peterson, Z. J. Wood. Fakesbook: A social networking platform for teaching security and privacy concepts to secondary school students. To Appear: *Proceedings of the ACM Technical Symposium on Computing Science Education (SIGCSE)*, 2019.
2. J. R. Morelock[†] and Z. Peterson. Authenticity, Ethicality, and Motivation: A Formal Evaluation of a 10-week Computer Security Alternate Reality Game for CS Undergraduates. In: *Proceedings of the Workshop on Advances in Security Education (ASE)*, USENIX, 2018. *Acceptance rate: 35.4% (11/31)*
3. Z. Wood, J. Clements, Z.N.J. Peterson, D. Janzen, H. Smith, and M. Haungs. Mixed approaches to CS0: Exploring topic and pedagogy variance after six years of CS0. In: *Proceedings of the Special Interest Group in Computer Science Education (SIGCSE) Symposium*, ACM, 2018.
4. M. Moore*, M. Zinkus*, N. Lemay*, Z. Peterson, and B. DeBruhl. Introducing Privacy to Undergraduate Computing Students. In: *Proceedings of the Consortium for Computing in the Colleges Southwest Region Conference*, 2018.
5. M.A. Gondree and Z.N.J. Peterson. This is Not a Game: Early Observations on Using Alternate Reality Games for Teaching Security Concepts to First-Year Undergraduates. In: *Proceedings of the Workshop on Cyber Security Experimentation and Test (CSET)*, USENIX, 2015. *Acceptance rate: 30.76% (8/26)*
6. E. Lau* and Z.N.J. Peterson. A Research Framework and Initial Study of Browser Security for the Visually Impaired. In: *Proceedings of the Workshop on Inclusive Privacy and Security (WIPS)*, 2015.
7. T. Peters[†], M. Gondree and Z.N.J. Peterson. DEFY: Deniable Encrypted File System for YAFFS. In: *Proceedings of the Network and Distributed System Security Symposium*, 2015. *Acceptance rate: 15.8% (50/315)*.
8. M. Gondree and Z.N.J. Peterson. Valuing Security by Getting [d0x3d!]: Experiences with a network security board game. In: *Proceedings of the Workshop on Cyber Security Experimentation and Test (CSET)*, USENIX, 2013. *Acceptance rate: 31% (9/29)*

Research Artifacts

[d0x3d!]: a network security board game. <http://www.d0x3d.com>. [d0x3d!] is a non-digital board game designed to introduce high school and undergraduate students to network security terminology, attack mechanics and basic computer security constructs. In [d0x3d!], two to four students take on the roles of black hat hackers working in cooperation to infiltrate and compromise a computer network, winning only when they collectively extract four valuable resources: personally-identifiable information, financial information, intellectual property and authentication credentials. The intent of [d0x3d!] is to engage students in computer science while removing common barriers associated with using a computer, such as feeling of isolation, lack of computer “comfort” or financial limitations. The game attempts to improve security literacy, encourage students to think adversarially, and introduce players to possible STEM career paths.

*Cal Poly undergraduate student.

[†]UVA PhD student.

[†]Cal Poly Masters student.

The Firewall Game. A cross between MasterMind and Red Rover, The Firewall Game has teams of students take on the role of “spies” tasked with reverse engineering the access control policy of an opposing team’s “castle” in order to sneak all members of their team inside. Students learn (perhaps, unknowingly) about state machines, logic and flow control, best practices in designing access control policies, and the difficulties in designing secure access control policies when requirements become too numerous or contradictory.

The Fakesbook. A simulated social network that allows students to explore the implications of various privacy settings, what can be garnered from other users and the site administrators through inference, and the strategies advertisers use in marketing products to cliques of users.

The Cal Poly Night Game. <https://www.nightgame.net>. An annual game held in the Winter on Cal Poly’s campus, the Night Game is a digital scavenger hunt, in which teams of students score points by finding insecure services hosted on rogue WiFi networks, solving cryptograms and physical puzzles, and defeating other cybersecurity-themed challenges, all under cover of darkness! Variants of the Cal Poly Night Game have been hosted at the Stanford iD Tech Summer Camp, Cal Poly Engineering Possibilities in College (EPIC) summer camp, and at Coast Union High School.

TableTop Security. <http://tabletopsecurity.com>. TableTopSecurity is my collaborative research project that serves the purpose of an umbrella organization for the community of researchers and practitioners interested investigating the use of games both in and out of classroom for computer security education. We host security exercises, educational puzzles, non-digital games and a variety of methods and resources designed to engage students in thinking adversarially about systems in responsible and accessible contexts.

Grants

National Security Agency (NSA). *GenCyber Program*. Grant # H98230-18-1-0099 , \$97,629.18. 2018

NSF Secure and Trustworthy Cyberspace Education (SaTC EDU). *Re-energizing K-12 Extramural Programs with Security Activities*. Award #1628726, \$299,782. Zachary N. J. Peterson (PI). Co-PI: Zoe Wood. 3/2016 – 5/2017.

Google Computer Science Engagement Award. \$5,000. Zachary N. J. Peterson (PI), 2015

Intel-NSF-Georgia Tech Information Security Center Security Education Micro-grant Program. *Teaching Computer Security Concepts in a First Year Course* \$5,000. Zachary N. J. Peterson (PI). 2014

NSF Secure and Trustworthy Cyberspace Education (SaTC EDU). *This is Not a Game—Using ARGs for Teaching Security Concepts to First-Year Undergraduates*. Award #1419318, \$196,073. Zachary N. J. Peterson (PI). 10/2014 – 9/2016.

NSF Federal Cyber Service: Scholarship for Service (SFS). *Monarch II: Cyber Corps Through Transformation*. Award #1241432, \$1,964,754. Cynthia Irvine (PI). Co-PIs: Zachary N. J. Peterson, Mark Gondree, Ted Huffmire. 2013

NSF Transforming Undergraduate Education: *Collaborative Research: Teaching Computer Security Concepts Through Interactive (Non-Digital) Games*. Award #1140561, \$196,594. Zachary N. J. Peterson (PI). Co-PIs: Mark Gondree (NPS), Kate Lockwood (CSU Monterey Bay), Joe Welch (Hartnell Community College). 9/2012 – 8/2014

Awards, Scholarships, Fellowships

2018–19 Cybersecurity Policy Fellow, New America, Washington, DC

2016–17 Cyber Security Fulbright Scholar, University College London, London, England

2014 Cal Poly ACM Professor of the Year

Invited Talks & Panels

- 2018 Invited Panelist. “Cybersecurity Workforce Development in R&E Environments.” CENIC Annual Conference, *Host*: Sean Peisert.
- 2016 Invited Speaker. “How Games Can Fix Computer Security Education.” University College London, *Host*: Jens Groth.
- 2016 Invited Speaker. “How Games Can Fix Computer Security Education.” Royal Holloway, University of London, *Host*: Lorenzo Cavallaro.
- 2016 Invited Speaker. “Cyber CSI II: Apple vs. FBI. Encryption, Privacy, and Policy.” Robert E Kennedy Data Studio Presents, *Host*: Jeanine Scaramozzino.
- 2016 Invited Panelist. “Teaching Computer Security: Thoughts from the Field.” USENIX Security Symposium, *Moderator*: Adrienne Porter-Felt.
- 2016 Invited Speaker. “A Million Hit Points and Infinite Charisma: How Games Can Fix Computer Security Education.” USENIX Enigma Conference, *Chairs*: David Brumley and Parisa Tabriz.
- 2015 Invited Panelist. “Cyber CSI: Working to Solve the Data Security Crisis.” Robert E Kennedy Data Studio Presents, *Host*: Jeanine Scaramozzino.
- 2015 Invited Speaker. “This is Not a Game: Using Alternate Realities to Teach Security Concepts to First-Year Undergraduates.” Georgia Tech/Intel/National Science Foundation Security Education Workshop, *Host*: Wenke Lee.
- 2015 Invited Panelist. “Educating Everyone.” National Science Foundation Secure and Trustworthy Cyberspace PI Meeting, *Host*: David Evans.
- 2014 Invited Speaker. “Valuing Security by Getting [d0x3d!]: security outreach using a network security board game.” Symposium on Curriculum Development in Security and Information Assurance (CDSIA), *Host*: Sigurd Meldal.
- 2013 Invited Speaker. “Games for Cybersecurity Education.” National Science Foundation Scholarship for Service Symposium, *Host*: Victor Piotrowski.

Professional Activities

- Workshop Founder USENIX Advances in Security Education (ASE)
USENIX Summit on Gaming, Games, and Gamification in Security Education (3GSE)
- Steering Committee USENIX Advances in Security Education (ASE)
USENIX Workshop on Health Information Technologies (HealthTech) ‘13
- Program Chair USENIX Advances in Security Education (ASE) ‘16
USENIX Summit on Gaming, Games, and Gamification in Security Education (3GSE) ‘14, ‘15
USENIX Workshop on Health Information Technologies (HealthTech) ‘13, Co-Chair
USENIX Workshop on Health Security and Privacy (HealthSec) ‘12, Co-Chair
- Chair IEEE Security & Privacy Workshops ‘16
- Vice Chair IEEE Security & Privacy Workshops ‘14, ‘15
- Program Committee ACM Special Interest Group in Computer Science Education (SIGCSE) ‘17, ‘18, ‘19
USENIX Enigma Conference ‘17, ‘18
USENIX Security Symposium ‘14, ‘15, ‘16, ‘18
Annual Computer Security Applications Conference (ACSAC) ‘13, ‘14, ‘15, ‘16, ‘17, ‘18
International Symposium on Research in Attacks, Intrusions and Defenses (RAID) ‘15
ACM Symposium on Information, Computer and Communication Security (ASIACCS) ‘13, ‘14, ‘15

USENIX Workshop on Cyber Security Experimentation and Test (CSET) '14, '15
 International Symposium on Engineering Secure Software and Systems (ESSoS) '13
 IEEE Symposium on Security and Privacy (Oakland) '12
 International Workshop on Storage Security and Survivability (StorageSS) '06
 External Reviewer ACM Transaction on Storage '10, '14
 IEEE Transactions on Dependable and Secure Computing '13
 IEEE Transactions on Information Forensics and Security '10,'11,'12
 IEEE Security and Privacy Magazine '10,'11,'12
 USENIX Conference on File and Storage Technologies '02,'09,'11
 IET Software '10
 Communications of the ACM '06
 IBM Systems Journal '06

Service and Outreach

2016–*cur* Selection Committee for the NCWIT Aspirations in Computing for the Central California Affiliate
 2016–18 Chair, Computer Science Department Cybersecurity Faculty Search Committee, Cal Poly
 2015–16 Member, Computer Science Department High Performance Computing Faculty Search Committee, Cal Poly
 2014–*cur* Permanent member, Selection Committee for Scholarships for Women Studying Information Security (SWSIS)
 2014–*cur* Co-Advisor, Cal Poly White Hat Computer Security Club, Cal Poly
 2014 Instructor, Paramount Summer Academy, Cal Poly
 2014–15 Chair, Computer Science Department Cybersecurity Faculty Search Committee, Cal Poly
 2013–14 Member, Computer Science Department Cybersecurity Faculty Search Committee, Cal Poly
 2013–*cur* Instructor, Engineering Possibilities in College (EPIC) Summer Camp, Cal Poly