Eric Osterweil

eoster@gmu.edu

Education

University of California, Los Angeles (UCLA) 2010 – *Ph.D. Computer Science*
Advisors: Lixia Zhang and Dan Massey
Thesis Topic: Measureable Security: a New Substrate for DNSSEC

The Johns Hopkins University, 1997 – *B.A. Computer Science + B.A. Physics*

Employment Experience

June 2018 - Present
George Mason University, VA – *Assistant Professor.*

October 2010 - June 2018
Verisign, Reston, VA – *Principal Scientist*
- Lead researcher on multiple projects, cross-organizational R&D teams, representative at government agencies and institute projects, and on community investigations and reviews.

May 2009 - March 2010
Colorado State University (under Dan Massey), Ft. Collins, CO – *Research Assistant*

June 2008 - September 2008
Palo Alto Research Center, PARC, Palo Alto, CA – *Summer Intern (under Van Jacobson)*
- Worked on crypto key learning for Named Data Networking, NDN (previously Content Centric Networking, CCN)

May 2005 - September 2010
University of California, Los Angeles (UCLA) – *Research Assistant (Under Lixia Zhang and Dan Massey)*

May 2004 - December 2004
Avaya, Los Angeles, CA – *Software Architect, Consultant*
- Worked on software architecture for large-scale messaging system.

September 2002 - May 2004
Center for Embedded Networked Sensing, CENS, Los Angeles, CA – *Research Assistant (under Deborah Estrin)*
- Worked on sensor network research and developed proof-of-concept systems.

January 2001 - July 2002
Micromuse, New York, NY – *Software Architect*
- Team-lead for architecture and development of commercial network auto-discovery tool.

November 1999 - January 2001
iWon.com, Irvington, NY – *Software Architect*
- Designed and built core messaging architecture for website.

June 1998 - November 1999
Thomson Financial, New York, NY – *Technical Lead*
- Led a team on large-scale distributed query dissemination and result-set synthesis

May 1997 - June 1998
RWD Technologies, Columbia, MD – *Engineer*
- Software engineer on multiple commercial products.

Filed Patents

A Method to Slow or Halt Network Threats with Infinite CNAME chain loops 11/22/2017 - Filed

Resilient Domain Name Service (DNS) Resolution When an Authoritative Name Server is Unavailable 08/7/2017 - Filed

Systems, Devices, and Methods for Detecting and Mitigating Domain Name Registrations Used for Malicious Behavior 07/31/2017 - Filed

Resilient Domain Name Service (DNS) Resolution When an Authoritative Name Server Is Unavailable 06/26/2017 - Filed

Managing Lame Delegated Domains Within a Managed DNS Service 06/23/2017 - Filed

Detection of Aberrant Domain Registration and Resolution Patterns 05/23/2017 - Filed

Detecting and Remediating Highly Vulnerable Domain Names Using Passive DNS Measurements 03/24/2017 - Published [US 2017-0279846 A1]

Systems, Devices, and Methods for Polymorphic Domain Name Resolution 12/28/2016 - Filed

Anycast-based Spoofed Traffic Detection and Mitigation 12/21/2016 - Filed

Profiling Domain Name System (DNS) Traffic 11/11/2016 - Filed

Externally Applying Internal Network 10/21/2016 - Filed

Policy establishment and guidance for content collection 08/31/2016 - Filed

Strengthening Integrity Assurances for DNS Data 07/28/2016 - Filed

Detecting and Mitigating Highly Vulnerable/Valuable Domains Using Passive DNS Measurements 03/25/2016 - Filed

Systems and Methods for Automating Client-side Discovery of Public Keys of External Contacts That Are Secured by DANE Using DNSSEC 03/21/2016 - Published [US 2017-0272467 A1]

Methods and Systems for Bootstrapping 09/22/2015 - Published [US 2017-0085380 A1]

Methods and Systems for Domain Name Data Networking 07/17/2015 - Published [20170019371]

Extending Dnssec Trust Chains to Objects Outside the DNS 07/06/2015 - Issued [US 2017-0310484 A1], [US 2017-0012780 A1], [US 2017-0012943 A1]

Systems and Methods for Device Detection and Authorization in a Iot Framework 03/06/2015 - Issued [20160259932]

Registering, Managing, and Communicating with Iot Devices Using Domain Name System Processes 01/09/2015 - Filed

Systems and Methods for Registering, Managing, and Communicating with Iot Devices Using Domain Name System 01/09/2015 - Issued [2016-0205078]

Name Collision Risk Manager And/Or Mitigation Strategy 03/06/2014 - Expired

Adaptive Name Resolution 03/14/2013 - Issued [US-2013-0198065-A1]

Providing Privacy Enhanced Resolution System in the Domain Name System 12/30/2011 - Issued [US-2013-0173825-A1], [US-2015-0058999-A1]

Authenticated Name Resolution 10/03/2011 - Published [US-2013-0085914-A1]

White Listing DNS Top-Talkers 08/11/2011 - Issued [US-2014-0026186-A1]

Journal and Major Magazine Articles

"[Verifying Keys through Publicity and Communities of Trust: Quantifying Off-Axis Corroboration](#)" Eric Osterweil, Dan Massey, Danny McPherson, Lixia Zhang, *IEEE Transactions on Parallel and Distributed Systems* 25, no. 2 (2014): 283-291, *Supplemental text [here](#)*

"[Deploying Cryptography in Internet-Scale Systems: A Case Study on DNSSEC](#)" Hao Yang, Eric Osterweil, Dan Massey, Lixia Zhang, *IEEE Transactions on Dependable and Secure Computing* 8, no. 5 (2011): 656-669

"[Interadministrative Challenges in Managing DNSKEYs](#)" Eric Osterweil, Lixia Zhang, *IEEE Security & Privacy* 7, no. 5 (2009).

"[Habitat Monitoring with Sensor Networks](#)" Rob Szewczyk, Eric Osterweil, Joe Polastre, Michael Hamilton, Alan Mainwaring, and Deborah Estrin, *Communications of the ACM* 47, no. 6 (2004): 34-40.

Conference and Workshop Papers

Note: The top venues in my fields are Security & Privacy (S&P) and Computer and Communications Security (CCS) for security research, SIGCOMM for networked systems research, the Internet Measurement Conference (IMC) is the premier venue for Internet measurements, the Passive Active Measurement conference (PAM) is the next best venue for Internet measurements (often for shorter papers), and HotNets is a prestigious hot-topics workshop for new ideas in networking.

"[Client-side Name Collision Vulnerability in the New gTLD Era: A Systematic Study](#)" Qi Alfred Chen, Matthew Thomas, Eric Osterweil, Yulong Cao, Jie You, Z. Morley Mao, In *ACM Conference on Computer and Communications Security (CCS '17)*, November 2017

"[MitM Attack by Name Collision: Cause Analysis and Vulnerability Assessment in the New gTLD Era](#)" Qi Alfred Chen, Eric Osterweil, Matthew Thomas, Z. Morley Mao, In *IEEE Symposium on Security and Privacy (S&P), 2016*, pp. 675-690. IEEE, 2016.

"[The Shape and Size of Threats: Defining a Networked System's Attack Surface](#)" Eric Osterweil, Danny McPherson, and Lixia Zhang, In *9th IEEE Workshop on Secure Network Protocols (NPSec), 2014* , pp. 636-641. *Best Paper Award*

"[Measuring IPv6 Adoption](#)" Jakub (Jake) Czyz, Mark Allman, Jing Zhang, Scott Iekel-Johnson, Eric Osterweil, and Michael Bailey, In *ACM SIGCOMM*, vol. 44, no. 4, pp. 87-98. ACM, 2014.

"[Dissecting Ghost Clicks: Ad Fraud Via Misdirected Human Clicks](#)" Sumayah Alrwais, Christopher Dunn, Minaxi Gupta, Alexandre Gerber, Oliver Spatscheck, Eric Osterweil, In *28th Annual Computer Security Applications Conference (ACSAC), 2012.* pp. 21-30. ACM, 2012.

"[Behavior of DNS' Top Talkers, a .com/.net View](#)" Eric Osterweil, Danny McPherson, Steve DiBenedetto, Christos Papadopoulos, Dan Massey, In *Passive and Active Measurement (PAM)*, pp. 211-220. Springer Berlin/Heidelberg, 2012.

"[Reducing the X.509 Attack Surface with DNSSEC's DANE](#)" Eric Osterweil, Burt Kaliski, Matt Larson, Danny McPherson, In *Securing and Trusting Internet Names (SATIN)* 2012.

"[The Great IPv4 Land Grab: Resource Certification for the IPv4 Grey Market](#)" Eric Osterweil, Shane Amante, Danny McPherson, Dan Massey, In *10th ACM Workshop on Hot Topics in Networks (HotNets)*, p. 12, 2011.

"Deploying and Monitoring DNS Security (DNSSEC)" Eric Osterweil, Dan Massey, Lixia Zhang, In *25th Annual Computer Security Applications Conference (ACSAC), 2009* pp. 429-438. IEEE, 2009.

"Managing Trusted Keys in Internet-Scale Systems" Eric Osterweil, Dan Massey, Lixia Zhang, In *Ninth Annual International Symposium on Applications and the Internet (SAINT), 2009.* pp. 153-156. IEEE, 2009.

"Quantifying the Operational Status of the DNSSEC Deployment" Eric Osterweil, Michael Ryan, Dan Massey, Lixia Zhang, In *8th ACM SIGCOMM conference on Internet measurement (IMC), 2008*, pp. 231-242.

"Limiting Replay Vulnerabilities in DNSSEC" He Yan, Eric Osterweil, Jon Hajdu, Jonas Acres, and Dan Massey, In *4th IEEE Workshop on Secure Network Protocols (NPSec), 2008.* pp. 3-8.

"Observations from the DNSSEC Deployment" Eric Osterweil, Dan Massey, Lixia Zhang, In *3rd IEEE Workshop on Secure Network Protocols (NPSec), 2007.* pp. 1-6.

"Zone State Revocation for DNSSEC" Eric Osterweil, Vasileios Pappas, Dan Massey, Lixia Zhang, In *ACM workshop on Large scale attack defense (LSAD), 2007.* pp. 153-160.

"Security Through Publicity" Eric Osterweil, Dan Massey, Batsukh Tsendjav, Beichuan Zhang, Lixia Zhang, In *1st USENIX Workshop on Hot Topics in Security (HotSec)*, 2006. pp. 3-3.

"System for Simulation, Emulation, and Deployment of Heterogeneous Sensor Networks" Lewis Girod, Thanos Stathopoulos, Nithya Ramanathan, Jeremy Elson, Deborah Estrin, Eric Osterweil, and Tom Schoellhammer, In *2nd ACM international conference on Embedded networked sensor systems, 2004.* pp. 201-213.

"Lightweight Temporal Compression of Microclimate Datasets" Tom Schoellhammer, Eric Osterweil, Ben Greenstein, Mike Wimbrow, Deborah Estrin, In *29th Annual IEEE International Conference on Local Computer Networks, 2004.* pp. 516-524.

Other Unrefereed Papers

"New gTLD Security, Stability, Resiliency Update: Exploratory Consumer Impact Analysis" Eric Osterweil, Matt Thomas, Andrew Simpson, Danny McPherson}, Verisign Labs Technical Report #1130008, August 2013

"New gTLD Security and Stability Considerations" Eric Osterweil, Danny McPherson, Verisign Labs Technical Report #1130007, March 2013

"TASRS: Towards a Secure Routing System Through Internet Number Resource Certification" Eric Osterweil, Danny McPherson, Verisign Labs Technical Report #1130009, February 2013

"IPsec's Appeal: Protecting DNS Under the Covers" Eric Osterweil, Danny McPherson, Verisign Labs Technical Report #1130006, January 2013

"Sizing Estimates for a Fully Deployed RPKI" Eric Osterweil, Terry Manderson, Russ White, Danny McPherson, Verisign Labs Technical Report #1120005, December 2012

"Operational Implications of the DNS Control Plane" Eric Osterweil, Danny McPherson, Lixia Zhang, IEEE Reliability Society Newsletter, May 2011

"Cross-Modal Vulnerabilities: An Illusive form of Hijacking" Eric Osterweil, Dan Massey, Christos Papadopoulos, Verisign Labs Technical Report #1140010, May 2010

"[Tools for Deployment and Simulation of Heterogeneous Sensor Networks](#)" Lewis Girod, Thanos Stathopoulos, Nithya Ramanathan, Eric Osterweil, Tom Schoellhammer, Deborah Estrin, CENS Technical Report #37, April 2004

Invited Talks

September 13, 2018
NIST Workshop on Reasoning About IoT Trustworthiness – *Panelist*

December, 2017
The President's National Security Telecommunications Advisory Committee (NSTAC) – Report to the President on Internet and Communications Resilience – *Briefer*

Service

March 2017 - PRESENT
ICANN Security, Stability, and Resiliency (SSR) Review Team – *Co-Chair/Vice-Chair*
- Co-led second Security, Stability, and Resiliency Review Team, oversight review of Internet Corporation for Assigned Names and Numbers (ICANN).

September 2013 - March 2015
Communications Security, Reliability and Interoperability Council (CSRIC) IV
- Participated in working groups:
    - Remediation of Server-Based DDoS Attacks (WG5)
    - Long-Term Core Internet Protocol Improvements (WG6)

September 2012 - March 2013
Communications Security, Reliability and Interoperability Council (CSRIC) III
- Participated in working groups:
    - Secure BGP Deployment (WG6)
    - ISP Botnet Remediation (WG7)

Teaching and Mentoring Experience

2011 - 2017
Mentor of Visiting Summer Research Assistant Interns
- Mentored seven Ph.D. Research Assistant interns from universities on summer research projects on Distributed Denial of Service (DDoS) defense, Internet inter-domain routing security, DNSSEC monitoring, and counterfeit website detection systems.

2011
Domain Name System (DNS) 101
- Lectured outreach course of basic DNS principles to operators from AfriNIC region

2009
Teaching Assistant for Advanced Networking, UCLA
- Gave stand-in lectures and ran sections and created homework assignments and graded