

CURRICULUM VITAE OF JEDIDIAH R. CRANDALL — Updated February 2015

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Education

Ph.D. Computer Science, Univ. of California at Davis, 2007.

Thesis title: Capturing and Analyzing Internet Worms.

B.S. Computer Science, Embry-Riddle Aeronautical University in Prescott, AZ, 2002.

Recent employment

2013–present: The University of New Mexico, Albuquerque, NM. Associate Professor.

2007–2013. The University of New Mexico, Albuquerque, NM. Assistant Professor.

Selected honors and awards

UNM Office of Graduate Studies Faculty Mentor Award, 2012.

UNM Dept. of Computer Science Qforma Lectureship, 2011.

UNM Dept. of Computer Science Qforma Lectureship, 2010.

NSF CAREER Award, 2009.

Best Graduate Student Researcher Award, U.C. Davis Computer Science Dept., 2006.

GAANN (Graduate Assistance in Areas of National Need) Fellowship, 2002-2003.

Steering Committees and Boards

USENIX Workshop on Free and Open Communications on the Internet (FOCI) (**Steering Committee member**)

New Mexico Supercomputing Challenge (**Board of Directors member**)

Program Committee memberships or Chair positions

Fifth USENIX Workshop on Free and Open Communications on the Internet (FOCI 2015).

15th Annual DFRWS Conference (DFRWS 2015).

Fourth USENIX Workshop on Free and Open Communications on the Internet (FOCI 2014). (**Co-chair**)

14th Annual DFRWS Conference (DFRWS 2014).

2014 Symposium and Bootcamp on the Science of Security (HotSoS)

2014 Passive and Active Measurements Conference (PAM 2014) (**Publicity Chair**)

Third USENIX Workshop on Free and Open Communications on the Internet (FOCI 2013). (**Co-chair**)

33rd International Conference on Distributed Computing Systems (ICDCS 2013).
13th Annual DFRWS Conference (DFRWS 2013).
Workshop on Hardware and Architectural Support for Security and Privacy (HASP 2012).
The IEEE International Conference on Cyber, Physical, and Social Computing (CPSCoM 2012).
Second USENIX Workshop on Free and Open Communications on the Internet (FOCI 2012).
12th Annual DFRWS Conference (DFRWS 2012).
32nd International Conference on Distributed Computing Systems (ICDCS 2012).
USENIX Workshop on Free and Open Communications on the Internet (FOCI 2011).
Conference on Security and Privacy in Communication Networks (SecureComm 2011).
ACM Computer and Communications Security Conference (CCS 2010).
European Workshop on System Security (EUROSEC 2010).
IEEE Symposium on Security and Privacy (Oakland 2009).
European Workshop on System Security (EUROSEC 2009).

Funded Grants

2014 TWC: Small: Developing Advanced Digital Forensic Tools Based on Network Stack Side Channels. National Science Foundation. \$458,033 (PI)

2013 TWC: Medium: Collaborative: Measurement and Analysis Techniques for Internet Freedom on IP and Social Networks. National Science Foundation. UNM share: \$610,450 (co-PI, joint project with Rice Univ.)

2012 UNM Information Assurance Scholarship for Service Program. National Science Foundation. \$423,831 (co-PI)

2012 Analysis and Mitigation of Internet Censorship. Intelligence Advanced Research Projects Agency. \$420,248 (co-PI)

2010 Realizing Full-System Dynamic Information Flow Tracking via Relaxed Static Stability. National Science Foundation. \$455,428 (PI)

2010 DARPA CRASH: Search in Co-evolutionary Adversarial Environments. Defense Advanced Research Projects Agency. \$3,200,625 (co-PI)

2009 TC: Medium: Collaborative Research: Securing Concurrency in Modern Systems. National Science Foundation. UNM share: \$399,991 (co-PI, joint project with UT Austin)

2009 CAREER: Internet Measurement in the Cat's Cradle of Global Internet Censorship. National Science Foundation. \$400,000 (co-PI)

PUBLICATIONS

NOTE: acceptance rates, where known, are shown in parentheses.

Invited chapters

Daniela Oliveira and Jedidiah R. Crandall. "Technical Foundations of Information Systems Security." *Invited chapter in the Computing Handbook Set—Information Systems and Information Technology, Third Edition.* Volume 2, Section 7. (Editor in Chief: Alan Tucker, Volume 2 Editor: Heikki Topi).

Journal papers

Roya Ensafi, Philipp Winter, Abdullah Mueen, and Jedidiah R. Crandall. "Analyzing the Great Firewall of China Over Space and Time." *To appear in the Proceedings on Privacy Enhancing Technologies (PoPETS)*. (**PoPETS 2015**)

Jedidiah R. Crandall, Masashi Crete-Nishihata, Jeffrey Knockel, Sarah McKune, Adam Senft, Diana Tseng, and Greg Wiseman. "Chat program censorship and surveillance in China: Tracking TOM-Skype and Sina UC." *First Monday Volume 18, Number 7, 1 July 2013*. (**2013**)

Bilal Shebaro, Fernando Perez-Gonzalez, and Jedidiah R. Crandall. "Exploiting Geometrical Structure for Forensic Applications of Timing Inference Channels." *International Journal of Digital Crime and Forensics (IJDCF)*. Vol. 5, no. 1. (**2013**)

Mohammed I. Al-Saleh, Antonio M. Espinoza, and Jedidiah R. Crandall. "Antivirus Performance Characterisation: System-Wide View." *IET Information Security, Volume 7, Issue 2, June 2013*, p. 126 - 133, DOI:10.1049/iet-ifs.2012.0192. (**2013**).

Bilal Shebaro and Jedidiah R. Crandall. "Privacy-Preserving Network Flow Recording." *Digital Investigation Journal*. Vol. 8, (Aug 2011), p. S90-S100. doi:10.1016/j.diin.2011.05.011. (**Digital Investigation Journal 2011**). (23%)

Bilal Shebaro, Fernando Perez-Gonzalez, and Jedidiah R. Crandall. *Digital Investigation Journal*. Vol. 7, (Aug 2010), p. S104-S113. doi:10.1016/j.diin.2010.05.013. (**Digital Investigation Journal 2010**). (41%)

J.R. Crandall, J. Brevik, S. Ye, G. Wassermann, D.A.S. de Oliveira, Z. Su, S.F. Wu, and F.T. Chong. "Putting Trojans on the Horns of a Dilemma: Redundancy for Information Theft Detection." *Transactions on Computational Science IV: Special Issue on Security in Computing. Springer Lecture Notes in Computer Science (Springer LNCS 2009)*, Volume 5430, pages 244–262. (23%)

J.R. Crandall, F.T. Chong, and S.F. Wu. "Minos: Architectural Support for Protecting Control Data." *ACM Transactions on Architecture and Code Optimization (ACM TACO 2006)*. Volume 3, Issue 4.

Refereed conference and workshop publications

Roya Ensafi, Philipp Winter, Abdullah Mueen, and Jedidiah R. Crandall. "Analyzing the Great Firewall of China Over Space and Time." *To appear at the 2015 Privacy Enhancing Technologies Symposium (PETS)*. Philadelphia, Pennsylvania. July 2015. (**PETS 2015**)

Xu Zhang, Jeffrey Knockel, and Jedidiah R. Crandall. "Original SYN: Finding Machines Hidden Behind Firewalls." *To appear in the Proceedings of IEEE INFOCOM 2015*. (**INFOCOM 2015**) (19%)

Geoffrey Alexander and Jedidiah R. Crandall. "Off-Path Round Trip Time Measurement via TCP/IP Side Channels." *To appear in the Proceedings of IEEE INFOCOM 2015*. (**INFOCOM 2015**) (19%)

Jeffrey Knockel and Jedidiah R. Crandall. "Counting Packets Sent Between Arbitrary Internet Hosts." *In the Proceedings of the 4th USENIX Workshop on Free and Open Communications on the Internet*. (**FOCI 2014**) (50%)

Jedidiah R. Crandall, Roya Ensafi, and Mike Jacobi. "A Case Study in Helping Students to Covertly Eat Their Classmates." *Invited paper to appear at the 2014 USENIX Summit on Gaming, Games and Gamification in Security Education*. (**3GSE '14**)

Roya Ensafi, Jeffrey Knockel, Geoffrey Alexander, and Jedidiah R. Crandall. "Detecting Intentional Packet Drops on the Internet via TCP/IP Side Channels." *In the Proceedings of the 2014 Passive and Active Measurements conference*. (**PAM 2014**) (31%)

Tao Zhu, David Phipps, Adam Pridgen, Jedidiah R. Crandall, and Dan S. Wallach. "The Velocity of Censorship: High-Fidelity Detection of Microblog Post Deletions." *In the Proceedings of the 22nd USENIX Security Symposium*. (**USENIX Security 2013**) (16%)

Peiyong Song, Anhe Shu, David Phipps, Dan Wallach, Mohit Tiwari, Jedidiah Crandall, and George Luger. "Language Without Words: A Pointillist Model for Natural Language Processing." *In the Proceedings of the 6th International Conference on Soft Computing and Intelligent Systems*. (**SCIS-ISIS 2012**)

Peiyong Song, Anhe Shu, Anyu Zhou, Dan Wallach, and Jedidiah R. Crandall. "A Pointillism Approach for Natural Language Processing of Social Media." *In the Proceedings of the 8th IEEE International Conference on Natural Language Processing and Knowledge Engineering*. (**IEEE NLP-KE 2012**) (30%)

Jeffrey Knockel and Jedidiah R. Crandall. "Protecting Free and Open Communications on the Internet Against Man-in-the-Middle Attacks on Third-Party Software: We're FOCI'd." *In the Proceedings of the 2nd USENIX Workshop on Free and Open Communications on the Internet*. (**FOCI 2012**) (50%)

Nicholas Aase, Jedidiah R. Crandall, Álvaro Díaz, Jeffrey Knockel, Jorge Ocaña Molinero, Jared Saia, Dan Wallach, and Tao Zhu. "Whiskey, Weed, and Wukan on the World Wide Web: On Measuring Censors' Resources and Motivations." *In the Proceedings of the USENIX Workshop on Free and Open Communications on the Internet*. (**FOCI 2012**) (50%)

Daniela Oliveira and Jedidiah R. Crandall. "Holographic Vulnerability Studies: Vulnerabilities as Fractures in Interpretation as Information Flows Across Abstraction Boundaries." *In the Proceedings of the New Security Paradigms Workshop*. (**NSPW 2012**) (40%)

Roya Ensafi, Mike Jacobi, and Jedidiah R. Crandall. "Students Who Don't Understand Information Flow Should be Eaten: An Experience Paper." *In the Proceedings of the 5th USENIX Workshop on Cyber Security Experimentation and Test*. (**CSET 2012**) (48%)

Antonio M. Espinoza and Jedidiah R. Crandall. "Work-in-Progress: Automated Named Entity Extraction for Tracking Censorship of Current Events." *In the Proceedings of the USENIX Workshop on Free and Open Communications on the Internet*. (**FOCI 2011**) (59%)

Jeffrey Knockel, Jedidiah R. Crandall, and Jared Saia. "Three Researchers, Five Conjectures: An Empirical Analysis of TOM-Skype Censorship and Surveillance." *In the Proceedings of the USENIX Workshop on Free and Open Communications on the Internet*. (**FOCI 2011**) (59%)

Bilal Shebaro and Jedidiah R. Crandall. "Privacy-Preserving Network Flow Recording." *In the Proceedings of the DFRWS 2011 Annual Conference*. (**DFRWS 2011**). (23%)

Mohammed I. Al-Saleh and Jedidiah R. Crandall. "Application-Level Reconnaissance: Timing Channel Attacks Against Antivirus Software." *In the Proceedings of the 4th USENIX Workshop on Large-Scale Exploits and Emergent Threats*. (**LEET 2011**) (44%)

Mohammed I. Al-Saleh and J.R. Crandall. "On Information Flow for Intrusion Detection: What if Accurate Full-system Dynamic Information Flow Tracking Was Possible?." *In the Proceedings of the New Security Paradigms Workshop*. (**NSPW 2010**). (44%)

Roya Ensafi, Jong C. Park, Deepak Kapur, and Jedidiah R. Crandall. “Idle Port Scanning and Non-interference Analysis of Network Protocol Stacks Using Model Checking.” *In the Proceedings of the 19th USENIX Security Symposium. (USENIX Security 2010)* (15%)

Bilal Shebaro, Fernando Perez-Gonzalez, and Jedidiah R. Crandall. “Leaving Timing Channel Fingerprints in Hidden Service Log Files.” *In the Proceedings of the DFRWS 2010 Annual Conference. (DFRWS 2010)*. (41%)

Jong C. Park and Jedidiah R. Crandall. “Empirical Study of a National-Scale Distributed Intrusion Detection System: Backbone-Level Filtering of HTML Responses in China.” *In the Proceedings of the 30th International Conference on Distributed Computing Systems. (ICDCS 2010)*. (14%)

Mohammed I. Al-Saleh, Patrick B. Bridges, and Jedidiah R. Crandall. “Architectural Support for Securing Sensor Networks Against Remote Attacks.” *In the Proceeding of the ISCA First International Conference on Sensor Networks and Applications (SNA 2009)*. (71%)

Jedidiah R. Crandall, Roya Ensafi, Stephanie Forrest, Joshua Ladau, and Bilal Shebaro. “The Ecology of Malware.” *In the Proceedings of the New Security Paradigms Workshop (NSPW 2008)*. (32%)

Daniela A.S. de Oliveira, Jedidiah R. Crandall, Gary Wassermann, Shaozhi Ye, Felix Wu, Zhendong Su, and Frederic T. Chong. “Bezoar: Automated Virtual Machine-based Full-System Recovery from Control-Flow Hijacking Attacks.” *In the Proceedings of the 2008 IEEE/IFIP Network Operations and Management Symposium (NOMS 2008)*. (29%)

Ryan Iwahashi, Daniela Oliveira, S. Felix Wu, Jedidiah Crandall, Young-Jun Heo, Jin-Tae Oh, and Jong-Soo Jang. “Towards Automatically Generating Double-Free Vulnerability Signatures Using Petri Nets.” *In the Proceedings of the 11th Information Security Conference (ISC 2008)*. (29%)

Jedidiah R. Crandall, Daniel Zinn, Michael Byrd, Earl Barr, and Rich East. “ConceptDoppler: A Weather Tracker for Internet Censorship.” *In the Proceedings of the 14th ACM Conference on Computer and Communications Security (CCS 2007)*. (18%)

J.R. Crandall, G. Wassermann, D.A.S. de Oliveira, Z. Su, S.F. Wu, and F.T. Chong. “Temporal Search: Detecting Hidden Malware Timebombs with Virtual Machines.” *In the Proceedings of the Twelfth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2006)*. (22%)

J.R. Crandall, Z. Su, S.F. Wu, and F.T. Chong. “On Deriving Unknown Vulnerabilities from Zero-Day Polymorphic and Metamorphic Worm Exploits.” *In the proceedings of the 12th ACM Conference on Computer and Communications Security (CCS 2005)*. (15%)

J.R. Crandall, S.F. Wu, and F.T. Chong. “Experiences Using Minos as A Tool for Capturing and Analyzing Novel Worms for Unknown Vulnerabilities.” *GI/IEEE SIG SIDAR Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA 2005)*. *Springer Lecture Notes in Computer Science*. (27%)

J.R. Crandall and F.T. Chong. “Minos: Control Data Attack Prevention Orthogonal to Memory Model.” *In the Proceedings of the 37th International Symposium on Microarchitecture (MICRO 2004)*. (18%)

J.R. Crandall and F.T. Chong. “A Security Assessment of the Minos Architecture.” *In the Proceedings of the Workshop on Architectural Support for Security and Anti-virus (WASSA 2004)*. *Boston, Massachusetts*.

J. Oliver, R. Rao, P. Sultana, J. Crandall, E. Czernikowski, L. Jones IV, D. Franklin, V. Akella, and F.T. Chong. “Synchrosalar: A Multiple Clock Domain, Power-Aware, Tile-Based Embedded Pro-

cessor." *In the Proceedings of the 31st International Symposium on Computer Architecture (ISCA 2004)*. (14%)