

Alexandros Kaparavelos

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Research Interests

My research interests span the areas of **systems and web security**. I am in particular interested in protecting the browser at all levels, from designing a secure browser architecture to measuring and understanding large-scale Internet attacks. Understanding how the web works and evolves over time and how we can make it more secure for the users is my current research focus.

Employment

Jan 2016-now **Assistant Professor**
Department of Computer Science
North Carolina State University

Active Grants and Contracts

- ONR XS-Shredder: A Cross-Layer Framework for Removing Code Bloat in Web Applications
Total Award: \$1,230,547; NCSU amount: \$300,000
Duration: 2 years (July 2017 - June 30, 2019)
NCSU PI: Alexandros Kaparavelos; PI: Adam Doupé; Co-PIs: Manuel Egele, Nick Nikiforakis
- NSF SaTC: CORE: Medium: Collaborative: Taming Web Content Through Automated Reduction in Browser Functionality
Total Award: \$1,199,787; NCSU amount: \$406,609
Duration: 4 years (September 1, 2017 - August 31, 2021)
NCSU PI: Alexandros Kaparavelos; PI: Adam Doupé; Co-PI: Engin Kirda

Education

- 2010-2015 **Ph.D. in Computer Security Lab,**
Computer Science Department,
University of California, Santa Barbara, USA.
thesis *Analyzing and Defending Against Evolving Web Threats*
supervisors Professor Christopher Kruegel, Professor Giovanni Vigna
- 2010 **M.Sc. Candidate in Distributed Computing Systems Lab,**
Computer Science Department,
University of Crete, Greece.
GPA: 8.7 out of 10.0
thesis *Robust Prevention of Dial Attacks*
supervisor Professor Evangelos Markatos

description An extensive evaluation of the security properties that arise from making accessible telephone devices from the Internet through the use of VoIP. The term Dial stands for *Digitally Initiated Abuse of teLephones*

2007 **B.Sc. in Computer Science**,
Computer Science Department, University of Crete, Greece.
GPA: 7.43 out of 10.0

thesis *Packetloss: A Passive end-to-end Packet Loss estimation*

supervisor Professor Evangelos Markatos

description A novel idea for estimating accurately the packet loss ratio between different measuring points.

Publications

- [1] L. Invernizzi, K. Thomas, **A. Kapravelos**, O. Comanescu, Jean-Michel Picod, and E. Bursztein. Cloak of Visibility: Detecting When Machines Browse A Different Web. In *Proceedings of the IEEE Symposium on Security and Privacy*, 2016.
- [2] K. Thomas, E. Bursztein, C. Grier, G. Go, N. Jagpal, **A. Kapravelos**, D. McCoy, A. Nappa, V. Paxson, P. Pearce, N. Provos, and M. Abu Rajab. Ad Injection at Scale: Assessing Deceptive Advertisement Modifications. In *Proceedings of the IEEE Symposium on Security and Privacy*. **Distinguished Practical Paper Award**, 2015.
- [3] A. Zarras, **A. Kapravelos**, G. Stringhini, T. Holz, C. Kruegel, and G. Vigna. The Dark Alleys of Madison Avenue: Understanding Malicious Advertisements. In *Proceedings of the Internet Measurement Conference (IMC)*, 2014.
- [4] **A. Kapravelos**, C. Grier, N. Chachra, C. Kruegel, G. Vigna, and V. Paxson. Hulk: Eliciting Malicious Behavior in Browser Extensions. In *Proceedings of the USENIX Security Symposium*, 2014.
- [5] G. De Maio, **A. Kapravelos**, Y. Shoshitaishvili, C. Kruegel, and G. Vigna. PExy: The other side of Exploit Kits. In *Proceedings of the Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA)*, 2014.
- [6] **A. Kapravelos**, Y. Shoshitaishvili, M. Cova, C. Kruegel, and G. Vigna. Revolver: An Automated Approach to the Detection of Evasive Web-based Malware. In *Proceedings of the USENIX Security Symposium*, 2013.
- [7] N. Nikiforakis, **A. Kapravelos**, W. Joosen, C. Kruegel, F. Piessens, and G. Vigna. Cookieless Monster: Exploring the Ecosystem of Web-based Device Fingerprinting. In *Proceedings of the IEEE Symposium on Security and Privacy*, 2013.
- [8] N. Nikiforakis, L. Invernizzi, **A. Kapravelos**, S. Van Acker, W. Joosen, C. Kruegel, F. Piessens, and G. Vigna. You are what you include: Large-scale evaluation of remote javascript inclusions. In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, 2012.
- [9] **A. Kapravelos**, M. Cova, C. Kruegel, and G. Vigna. Escape from Monkey Island: Evading High-Interaction Honeyclients. In *Proceedings of the Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA)*, 2011.

- [10] **A. Kapravelos**, I. Polakis, E. Athanasopoulos, S. Ioannidis, and E.P. Markatos. D(e|i)aling with VoIP: Robust Prevention of Dial Attacks. In *Proceedings of the European Symposium on Research in Computer Security (ESORICS)*, 2010.
- [11] A. Friedl, S. Ubik, **A. Kapravelos**, M. Polychronakis, and E.P. Markatos. Realistic Passive Packet Loss Measurement for High-Speed Networks. In *Proceedings of the International Workshop on Traffic Monitoring and Analysis (TMA)*, 2009.
- [12] N. Armenatzoglou, Y. Marketakis, L. Kriara, E. Apostolopoulos, V. Papavasiliou, D. Kampas, **A. Kapravelos**, E. Kartsonakis, G. Linardakis, S. Nikitaki, A. Bikakis, and G. Antoniou. Flexconf: A flexible conference assistant using context-aware notification services. In *Proceedings of the IEEE Workshop on Context Aware Mobile Systems (CAMS)*, 2009.
- [13] A. Papadogiannakis, **A. Kapravelos**, M. Polychronakis, E.P. Markatos, and A. Ciuffoletti. Passive end-to-end packet loss estimation for grid traffic monitoring. In *Proceedings of the CoreGRID Integration Workshop*, 2006.

Teaching Experience

- Fall 2017 CSC-591 Systems Attacks and Defenses
- Spring 2017 CSC-405 Introduction to Computer Security
- Fall 2016 CSC-574 Computer and Network Security
- Spring 2016 CSC-705 Operating Systems Security
- 2010-2014 International Capture the Flag (iCTF) - I was one of the organizing members for the worlds' largest educational hacking competition for 4 years
- November 2012 Guest Lecture titled "Web Application Security" at UCSB's CS177 class "Computer Security and Privacy"
- April 2012 "Into the Mind of the Hacker" - Three hour hands-on workshop at UC Santa Barbara by request of Web Standard Group
- Spring 2009 Teaching Assistant, CS459 - Internet Measurements, University of Crete
- Spring 2008 Teaching Assistant, CS118 - Discrete Mathematics, University of Crete
- Fall 2007, Fall 2008 Teaching Assistant, CS345 - Operating Systems, University of Crete

Work Experience

- 2016 – future I am an Assistant Professor in the Department of Computer Science at North Carolina State since January 2016.
- 2010 – 2015 As a Research Assistant in the Computer Security Lab at the University of California, Santa Barbara I was the lead developer of Wepawet, a public platform for the analysis of web-based threats. I also deployed a new public platform to track the evolution of malicious JavaScript attacks based on the work that I did for the Revolver paper. I was also part of the core team organizing the UCSB International Capture the Flag (iCTF) hacking competition, the largest live security exercise with more than 900 participating students and a proud member of the Shellphish hacking group.
- Sept – Dec 2014 I did an internship at Google at the anti-abuse research group under the supervision of Elie Bursztein and worked on a project with the goal to understand in depth ad injection from malicious browser extensions.

- June – Sept 2014 I visited the Security Group at UC San Diego for 3 months and worked with Stefan Savage and Geoff Voelker on a machine learning project regarding malicious browser extensions.
- Oct – Dec 2013 I consulted at Lastline Inc. for 3 months regarding advanced web security problems based on my experience from Wepawet.
- June – Sept 2013 For the summer of 2013 I visited the International Computer Science Institute at Berkeley to work as an intern with Chris Grier and Vern Paxson. My project there was to understand and develop methods to detect malicious extensions for the Chrome browser.
- 2005 – 2010 I worked as a Research Assistant at Distributed Computing Systems Lab of FORTH-ICS in Heraklion. I participated in two EU-funded programs: LOBSTER (Large-scale Monitoring of Broadband Internet Infrastructures) and MOMENT (Monitoring and Measurement in the Next Generation Technologies).
- Sep - Nov 2009 I visited Prof. Christopher Kruegel and Giovanni Vigna for 3 months at the University of California, Santa Barbara and worked in the Computer Security Lab as Junior Research Assistant.

Awards

- 2015 Distinguished Practical Paper Award from IEEE Symposium on Security and Privacy
- 2015 UC Santa Barbara - Outstanding Dissertation Award

Service

- Security Session co-Chair International Conference on Parallel and Distributed Systems (ICPADS): 2016
- TPC member ACM Conference on Data and Application Security and Privacy (CODASPY): 2017, 2018
- TPC member Annual Computer Security Applications Conference (ACSAC): 2016, 2017
- TPC member Workshop on Offensive Technologies (WOOT): 2016, 2017
- TPC member USENIX Security Symposium: 2017, 2018
- TPC member Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA): 2017, 2018
- TPC member Symposium on Electronic Crime Research (eCrime): 2016, 2017, 2018
- TPC member European Workshop on Systems Security (EuroSec): 2018
- TPC member World Wide Web Conference (WWW) - Security Track: 2018
- TPC member ACM Symposium on Applied Computing (SAC) - Security Track: 2018
- TPC member NSF SaTC panel: 2016

Updated

December, 2017