

Dave Levin

Contact Info

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Education

University of Maryland, College Park, Maryland USA

Ph.D., Computer Science, September 2010

- Dissertation: Systems-compatible Incentives
- Advisors: Bobby Bhattacharjee, Neil Spring, and Aravind Srinivasan

B.S., Computer Science, May 2002

B.S., Mathematics, May 2002

University of Notre Dame, Notre Dame, Indiana USA

Attended August 1997 – May 1999

Honors and Awards

- Reviewer award, SIGCOMM 2012
 - Best paper, USENIX NSDI 2009, for *TrInc: Small Trusted Hardware for Large Distributed Systems*
 - Best presentation, Computer Science track of UMD Graduate Research Interaction Day, 2009
 - Microsoft Live Labs fellowship, awarded 2008
 - Dean's fellowship for excellence in research, Computer Science Dept., Univ. of Maryland, 2006
 - Outstanding undergraduate computer science teaching assistant award, Univ. of Maryland, 2002
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Refereed

Publications

1. **Picocenter: Supporting long-lived, mostly-idle applications in cloud environments**
Liang Zhang, James Litton, Frank Cangialosi, Theophilus Benson, Dave Levin, Alan Mislove
European Conference on Computer Systems (EuroSys 2016)
2. **Ting: Measuring and Exploiting Latencies Between All Tor Nodes**
Frank Cangialosi, Dave Levin, Neil Spring
ACM IMC 2015 (Internet Measurement Conference) Long paper
3. **An End-to-End Measurement of Certificate Revocation in the Web's PKI**
Yabing Liu, Will Tome, Liang Zhang, David Choffnes, Dave Levin, Bruce Maggs, Alan Mislove, Aaron Schulman, Christo Wilson
ACM IMC 2015 (Internet Measurement Conference) Long paper
4. **Alibi Routing**
Dave Levin, Youndo Lee, Luke Valenta, Zhihao Li, Victoria Lai, Cristian Lumezanu, Neil Spring, Bobby Bhattacharjee
ACM SIGCOMM 2015
5. **Build It Break It: Measuring and Comparing Development Security**
Andrew Ruef, Michael Hicks, James Parker, Dave Levin, Atif Memon, Jan Plane, Piotr Mardziel
CSET 2015 (Workshop on Cyber Security Experimentation and Test)
6. **Programming Slick Network Functions**
Bilal Anwer, Theophilus Benson, Nick Feamster, Dave Levin
SOSR 2015 (Symposium on SDN Research)
7. **UAv6: Alias Resolution in IPv6 Using Unused Addresses**
Ramakrishna Padmanabhan, Zhihao Li, Dave Levin, Neil Spring
PAM 2015 (Passive and Active Measurement Conference)
8. **RevCast: Fast, Private Certificate Revocation over FM Radio**
Aaron Schulman, Dave Levin, Neil Spring
ACM CCS 2014 (Conference on Computer and Communications Security)

9. **Analysis of SSL Certificate Reissues and Revocations in the Wake of Heartbleed**
Liang Zhang, Dave Choffnes, Tudor Dumitras, Dave Levin, Alan Mislove, Aaron Schulman, Christo Wilson
ACM IMC 2014 (Internet Measurement Conference) Long paper
Invited to appear as a Research Highlight in Communications of the ACM (in process)
10. **D-mystifying the D-root Address Change**
Matthew Lentz, Dave Levin, Jason Castonguay, Neil Spring, Bobby Bhattacharjee
ACM IMC 2013 (Internet Measurement Conference) Short paper
11. **A Slick Control Plane for Network Middleboxes**
Bilal Anwer, Theophilus Benson, Nick Feamster, Dave Levin, Jennifer Rexford
Poster at HotSDN 2013 (Hot Topics in Software Defined Networking), and paper at ONS 2013 (Open Network Summit)
12. **SDX: A Software Defined Internet Exchange**
Josh Bailey, Russ Clark, Nick Feamster, Dave Levin, Jennifer Rexford, Scott Shenker
ONS 2013 (Open Network Summit)
13. **Making Currency Cheap with iOwe**
Dave Levin, Aaron Schulman, Katrina LaCurts, Neil Spring, Bobby Bhattacharjee
NetEcon 2011 (Workshop on the Economics of Networks, Systems, and Computation)
14. **Secure Sharing in Distributed Information Management Applications: Problems and Directions**
Piotr Mardziel, Adam Bender, Michael Hicks, Dave Levin, Mudhakar Srivatsa, Jonathan Katz
ACITA 2010 (Annual Conference of the International Technology Alliance)
15. **Don't Love Thy Nearest Neighbor**
Cristian Lumezanu, Dave Levin, Bo Han, Neil Spring, Bobby Bhattacharjee
IPTPS 2010 (International Workshop on Peer-to-Peer Systems)
16. **Stay or go? Participation in Under-Provisioned Video Streams**
Dave Levin, Daniel Malter, Neil Spring, Bobby Bhattacharjee
NetEcon 2009 (Workshop on the Economics of Networks, Systems, and Computation)
17. **TrInc: Small Trusted Hardware for Large Distributed Systems**
Dave Levin, John R. Douceur, Jacob R. Lorch, and Thomas Moscibroda
NSDI 2009 (USENIX Symposium on Networked Systems Design and Implementation)
18. **Symbiotic Relationships in Internet Routing Overlays**
Cristian Lumezanu, Randy Baden, Dave Levin, Neil Spring, and Bobby Bhattacharjee
NSDI 2009 (USENIX Symposium on Networked Systems Design and Implementation)
19. **BitTorrent is an Auction: Analyzing and Improving BitTorrent's Incentives**
Dave Levin, Katrina LaCurts, Neil Spring, and Bobby Bhattacharjee.
ACM SIGCOMM 2008
20. **Motivating Participation in Internet Routing Overlays**
Dave Levin, Randolph Baden, Cristian Lumezanu, Neil Spring, and Bobby Bhattacharjee
NetEcon 2008 (Workshop on the Economics of Networks, Systems, and Computation)
21. **On the Fidelity of 802.11 Packet Traces**
Aaron Schulman, Dave Levin and Neil Spring.
PAM 2008 (Passive and Active Measurement Conference)
22. **Capacity of Asynchronous Random-Access Scheduling in Wireless Networks**
Deepti Chafekar, Anil Kumar, Dave Levin, Madhav Marathe, Srinivasan Parthasarathy and Aravind Srinivasan.
INFOCOM 2008 (IEEE Conference on Computer Communications)

Technical
Reports

23. **PeerWise Discovery and Negotiation of Faster Paths**
Cristian Lumezanu, Dave Levin and Neil Spring.
HotNets 2007 (Workshop on Hot Topics in Networks)
24. **Backbone Construction in Selfish Wireless Networks**
Seungjoon Lee, Dave Levin, Vijay Gopalakrishnan and Bobby Bhattacharjee.
SIGMETRICS 2007 (ACM Int'l. Conference on Measurement and Modeling of Computer Systems)
25. **Boycotting and Extorting Nodes in an Internetwork**
Dave Levin, Adam Bender, Cristian Lumezanu, Neil Spring and Bobby Bhattacharjee.
NetEcon+IBC 2007 (Workshop on the Econ. of Networked Systems / Incentive-Based Computing)
26. **Accountability as a Service**
Adam Bender, Neil Spring, Dave Levin and Bobby Bhattacharjee.
SRUTI 2007 (Workshop on Steps to Reducing Unwanted Traffic in the Internet)
27. **Punishment in Selfish Wireless Networks: A Game Theoretic Analysis**
Dave Levin.
NetEcon 2006 (Workshop on the Economics of Networked Systems)
28. **Fair File Swarming with FOX**
Dave Levin, Rob Sherwood and Bobby Bhattacharjee.
IPTPS 2006 (International Workshop on Peer-to-Peer Systems)
29. **ProofRite: A Paper-Augmented Word Processor**
Kevin Conroy, Dave Levin and François Guimbretière.
UIST 2004 Demonstration (ACM Symposium on User Interface Software and Technology)
30. **Nurikabe: Private yet Accountable Online Advertising**
Dave Levin, Bobby Bhattacharjee, John R. Douceur, Jacob R. Lorch, James Mickens, and Thomas Moscibroda
31. **Incentive-Compatible Bootstrapping**
Dave Levin, Katrina LaCurts, Aaron Schulman, Neil Spring, and Bobby Bhattacharjee
32. **A Secure DHT via the Pigeonhole Principle**
Randy Baden, Adam Bender, Dave Levin, Rob Sherwood, Neil Spring and Bobby Bhattacharjee.
33. **Paranoia: An Anonymous, Censorship-Resistant File Store**
Dave Levin and Bobby Bhattacharjee.
34. **DDoS Detection in Multi-Homed Stub Domains**
Chris Kommareddy, Dave Levin, Bobby Bhattacharjee, Richard La, Mark Shayman and Vahid Tabatabaee.
35. **Hoodnets: Mobile Users Bonding over Auctions**
Dave Levin, Robert Kiefer, Kevin McGehee, Kristin Stephens, Koyel Mukherjee, Neil Spring, and Bobby Bhattacharjee
36. **Systems-Compatible Incentives**
Dave Levin, Neil Spring, and Bobby Bhattacharjee
GameNets 2009 (International Conference on Game Theory for Networks)

Invited Papers

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- Funding
- NSF CNS-1409249 **CSR: Medium: Collaborative Research: Towards Finer-grained Cloud Computing**, \$1.2M (total) \$400,000 (UMD). August 2014–2018. Primary Investigator, joint with Alan Mislove (Northeastern University) and Theophilus Benson (Duke University).
 - University of Maryland Partnership with the Laboratory for Telecommunications Sciences (LTS), **Securing Critical Network Infrastructure**, \$197,999, Co-Primary Investigator, joint with Bobby Bhattacharjee and Neil Spring.
 - University of Maryland Partnership with the Laboratory for Telecommunications Sciences (LTS), **Bitcoin: Detecting and Characterizing Attacks**, \$149,820, Co-Primary Investigator, joint with Bobby Bhattacharjee and Neil Spring.
 - NSF SaTC EDU-1319147 **EDU: Competing to Build Secure Systems**, \$300,000. September 2013–2015. Co-Primary Investigator, joint with Michael Hicks (PI), Atif Memon, and Jandelyn Plane.
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- Classes Taught
- CMSC 414 (Computer and Network Security). Spring 2016
 - CMSC 396H (Computer Science Honors Seminar). Spring 2016
 - CMSC 499A (Independent Study: Analyzing CDNs' Roles in the Web's PKI). Fall 2015
 - CMSC 499A (Independent Study: Obfuscated Communication through Skype Video). Fall 2015
 - CMSC 414 (Computer and Network Security). Spring 2015
 - CMSC 414 (Computer and Network Security). Spring 2014
 - CMSC 499A (Independent Study: Anonymous DTN Routing). Spring 2014
 - CMSC 330 (Organization of Programming Languages). Spring 2013
 - CMSC 499A (Independent Study: Provable Route Avoidance using Alibi Routing). Spring 2013
 - CMSC 818F (Securing and Monetizing the Internet). Spring 2013
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- Service Activities
- Program committee member:
- IMC 2016 (ACM Internet Measurement Conference)
 - NetEcon 2011, 2013, 2014, 2015, 2016 (Workshop on the Economics of Networks, Systems, and Computation)
 - SOSR 2016 (Symposium on SDN Research)
 - SIGCOMM 2012, 2013 (ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communications), *Winner, best reviewer award (2012)*
 - NSDI 2013 (USENIX Symposium on Networked Systems Design and Implementation)
 - ICNP 2012 (IEEE International Conference on Network Protocols)
 - DIALM-POMC 2010 (ACM International Workshop on Foundations of Mobile Computing)

General chair:

- HotNets 2013 (ACM Workshop on Hot Topics in Networks)

National Science Foundation panelist:

- NSF SaTC 2015 (Secure and Trustworthy Cyberspace)

Computing Research Association (CRA) Congressional Fly-in, 2015

- Departmental Activities
- Co-founder of GTRG, a game theory reading group for the Computer Science Department (see <https://www.cs.umd.edu/~dml/gtrg.html>).
 - Elected member of the Computer Science Department's Education Committee, 2005 – 2006.
 - President of the Executive Council, the graduate student governing body for promoting interaction among students and faculty in the computer science department, 2004 – 2005.

Invited Talks	<p><i>The Ugly Truth about Certificate Revocation</i></p> <ul style="list-style-type: none"> • Maryland Cybersecurity Center Symposium • ICF Internationals CyberSci Summit • Duke University. Hosted by Theo Benson 	<p>December 2015 October 2015 August 2014</p>
	<p><i>Alibi Routing</i></p> <ul style="list-style-type: none"> • SIGCOMM Conference 	<p>August 2015</p>
	<p><i>Maritime Cybersecurity</i></p> <ul style="list-style-type: none"> • National Maritime Electronics Association (NMEA) Conference 	<p>October 2015</p>
	<p><i>Analysis of SSL Certificate Reissues and Revocations in the Wake of Heartbleed</i></p> <ul style="list-style-type: none"> • NANOG 62 (Security track). Baltimore, MD 	<p>October 2014</p>
	<p><i>D-mystifying the D-root Address Change</i></p> <ul style="list-style-type: none"> • NANOG 62 (DNS track). Baltimore, MD 	<p>October 2014</p>
	<p><i>Tune-in to Tune-out: Using FM radio to revoke certificates</i></p> <ul style="list-style-type: none"> • Maryland Cybersecurity Center Symposium 	<p>May 2014</p>
	<p><i>Avoiding Censors by Proving the Impossible</i></p> <ul style="list-style-type: none"> • Laboratory for Telecommunication Sciences (LTS) Symposium 	<p>March 2014</p>
	<p><i>Proving the Impossible with Alibi Protocols</i></p> <ul style="list-style-type: none"> • Maryland Cybersecurity Center (MC2) Symposium 	<p>May 2013</p>
	<p><i>Systems without Cooperation</i></p> <ul style="list-style-type: none"> • William and Mary College. • Stanford University Networking Seminar. • Georgia Tech. Hosted by Nick Feamster. • University of Wisconsin-Madison. Hosted by Suman Banerjee. 	<p>April 2013 July 2009 December 2008 December 2008</p>
	<p><i>Making Currency Cheap with iOwe</i></p> <ul style="list-style-type: none"> • NetEcon Workshop 	<p>July 2011</p>
	<p><i>Stay or Go? Participation in Under-provisioned Multicast Systems</i></p> <ul style="list-style-type: none"> • NetEcon Workshop 	<p>July 2009</p>
	<p><i>Systems-Compatible Incentives</i></p> <ul style="list-style-type: none"> • GameNets Conference 	<p>May 2009</p>
	<p><i>TrInc: Small Trusted Hardware for Large Distributed Systems</i></p> <ul style="list-style-type: none"> • NSDI Conference 	<p>April 2009</p>
	<p><i>BitTorrent Is an Auction: Analyzing and Improving BitTorrent's Incentives</i></p> <ul style="list-style-type: none"> • SIGCOMM Conference 	<p>August 2008</p>
	<p><i>Motivating Participation in Internet Routing Overlays</i></p> <ul style="list-style-type: none"> • NetEcon Workshop 	<p>August 2008</p>
	<p><i>Boycotting and Extorting Nodes in an Internetwork</i></p> <ul style="list-style-type: none"> • NetEcon Workshop 	<p>June 2007</p>
	<p><i>Punishment in Selfish Wireless Networks</i></p> <ul style="list-style-type: none"> • NetEcon Workshop 	<p>June 2006</p>
	<p><i>Fair File Swarming with FOX</i></p> <ul style="list-style-type: none"> • IPTPS Workshop • University of Delaware. Hosted by Paul Amer. 	<p>February 2006 September 2005</p>

Professional
Experience

University of Maryland, College Park, MD USA

Assistant Research Scientist

2012 – present

I currently perform and advise research in a wide range of networked systems and security, spanning the design and implementation of secure and incentives-compatible systems, securing the web's PKI, and improving security education for undergraduate students. I also teach undergraduate and graduate courses, typically on computer security. I have served as a co-chair of the Computer Science Undergraduate Honors program since Fall 2015.

Hewlett Packard Labs, Palo Alto, California USA

Researcher

2010 – 2012

Worked in the Social Computing Group with Bernardo Huberman, with a focus on building systems that allow users to share network resources while addressing incentives, security, and usability concerns.

Microsoft Research, Redmond, Washington USA

Researcher; Summer Intern

2008 – 2009

Worked in the Distributed Systems and Security group with John Douceur, Jacob Lorch, James Mickens, and Thomas Moscibroda on the design of secure and incentive-compatible protocols. The two summers resulted in a best paper at NSDI 2009 and a submission to NSDI 2010.

Hewlett Packard Labs, Palo Alto, California USA

Researcher; Summer Intern

2006

Worked in Bernardo Huberman's Information Dynamics Lab. Worked closely with Kevin Lai on a source-initiated multicast protocol. Collaborated with other researchers on topics ranging from social networking to decentralized digital markets.

Space/Ground System Solutions, La Plata, Maryland USA

Software Engineer

2002 – 2003

Designed, developed, and supported application-level device drivers in C. Ported some of the code from legacy Fortran on a VAX.

TIPS Technology, Crofton, Maryland USA

Software Developer

2001

Designed, developed, and supported myriad web-based applications in Perl, MySQL, and Java.

Motorola, Arlington Heights, Illinois USA

Software Engineer; Summer Intern

1999 – 2000

Aided in design, coding, and testing of embedded software responsible for communication between 3G cell phones and base stations.

U.S. Department of Defense, Dahlgren, Virginia USA

Systems Administrator; Summer Intern

1996 – 1998

Administered a lab consisting of SGI, Sun, and Windows machines.