

# Dave Levin

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## Contact Info

Email: [dml@cs.umd.edu](mailto:dml@cs.umd.edu)

Webpage: <https://www.cs.umd.edu/~dml>

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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

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## 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. **Measuring and Applying Invalid SSL Certificates: The Silent Majority**  
Taejoong Chung, Yabing Liu, David Choffnes, Dave Levin, Bruce M. Maggs, Alan Mislove, Christo Wilson  
ACM IMC 2016 (Internet Measurement Conference) Long paper
2. **Measurement and Analysis of Private Key Sharing in the HTTPS Ecosystem**  
Frank Cangialosi, Taejoong Chung, David Choffnes, Dave Levin, Bruce M. Maggs, Alan Mislove, Christo Wilson  
ACM CCS 2016 (Conference on Computer and Communications Security)
3. **Build It, Break It, Fix It: Contesting Secure Development**  
Andrew Ruef, Michael Hicks, James Parker, Dave Levin, Michelle Mazurek, Piotr Mardziel  
ACM CCS 2016 (Conference on Computer and Communications Security)
4. **Picocenter: Supporting long-lived, mostly-idle applications in cloud environments**  
Liang Zhang, James Litton, Frank Cangialosi, Theophilus Benson, Dave Levin, Alan Mislove  
EuroSys 2016 (European Conference on Computer Systems)
5. **Ting: Measuring and Exploiting Latencies Between All Tor Nodes**  
Frank Cangialosi, Dave Levin, Neil Spring  
ACM IMC 2015 (Internet Measurement Conference) Long paper
6. **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
7. **Alibi Routing**  
Dave Levin, Youndo Lee, Luke Valenta, Zhihao Li, Victoria Lai, Cristian Lumezanu, Neil Spring, Bobby Bhattacharjee  
ACM SIGCOMM 2015

8. **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)
9. **Programming Slick Network Functions**  
Bilal Anwer, Theophilus Benson, Nick Feamster, Dave Levin  
SOSR 2015 (Symposium on SDN Research)
10. **UA6: Alias Resolution in IPv6 Using Unused Addresses**  
Ramakrishna Padmanabhan, Zhihao Li, Dave Levin, Neil Spring  
PAM 2015 (Passive and Active Measurement Conference)
11. **RevCast: Fast, Private Certificate Revocation over FM Radio**  
Aaron Schulman, Dave Levin, Neil Spring  
ACM CCS 2014 (Conference on Computer and Communications Security)
12. **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)*
13. **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
14. **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)
15. **SDX: A Software Defined Internet Exchange**  
Josh Bailey, Russ Clark, Nick Feamster, Dave Levin, Jennifer Rexford, Scott Shenker  
ONS 2013 (Open Network Summit)
16. **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)
17. **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)
18. **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)
19. **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)
20. **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)
21. **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)

22. **BitTorrent is an Auction: Analyzing and Improving BitTorrent's Incentives**  
Dave Levin, Katrina LaCurts, Neil Spring, and Bobby Bhattacharjee.  
ACM SIGCOMM 2008
23. **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)
24. **On the Fidelity of 802.11 Packet Traces**  
Aaron Schulman, Dave Levin and Neil Spring.  
PAM 2008 (Passive and Active Measurement Conference)
25. **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)
26. **PeerWise Discovery and Negotiation of Faster Paths**  
Cristian Lumezanu, Dave Levin and Neil Spring.  
HotNets 2007 (Workshop on Hot Topics in Networks)
27. **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)
28. **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)
29. **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)
30. **Punishment in Selfish Wireless Networks: A Game Theoretic Analysis**  
Dave Levin.  
NetEcon 2006 (Workshop on the Economics of Networked Systems)
31. **Fair File Swarming with FOX**  
Dave Levin, Rob Sherwood and Bobby Bhattacharjee.  
IPTPS 2006 (International Workshop on Peer-to-Peer Systems)
32. **ProofRite: A Paper-Augmented Word Processor**  
Kevin Conroy, Dave Levin and François Guimbretière.  
UIST 2004 Demonstration (ACM Symposium on User Interface Software and Technology)
33. **Nurikabe: Private yet Accountable Online Advertising**  
Dave Levin, Bobby Bhattacharjee, John R. Douceur, Jacob R. Lorch, James Mickens, and Thomas Moscibroda
34. **Incentive-Compatible Bootstrapping**  
Dave Levin, Katrina LaCurts, Aaron Schulman, Neil Spring, and Bobby Bhattacharjee
35. **A Secure DHT via the Pigeonhole Principle**  
Randy Baden, Adam Bender, Dave Levin, Rob Sherwood, Neil Spring and Bobby Bhattacharjee.
36. **Paranoia: An Anonymous, Censorship-Resistant File Store**  
Dave Levin and Bobby Bhattacharjee.
37. **DDoS Detection in Multi-Homed Stub Domains**  
Chris Kommareddy, Dave Levin, Bobby Bhattacharjee, Richard La, Mark Shayman and Vahid Tabatabaee.

Technical  
Reports

38. **Hoodnets: Mobile Users Bonding over Auctions**

Dave Levin, Robert Kiefer, Kevin McGehee, Kristin Stephens, Koyel Mukherjee, Neil Spring, and Bobby Bhattacharjee

Invited Papers

39. **Systems-Compatible Incentives**

Dave Levin, Neil Spring, and Bobby Bhattacharjee  
GameNets 2009 (International Conference on Game Theory for Networks)

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Funding

- NSF CNS-1619048 **NeTS: Small: Residential Network Outage Detection**, \$366,000. October 2016–2019. Co-Primary Investigator, joint with Neil Spring (PI).
- University of Maryland Partnership with the Laboratory for Telecommunications Sciences (LTS), **DNS and External Data Fusion Research**, \$344,593, Co-Primary Investigator, joint with Bobby Bhattacharjee and Neil Spring.
- 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:

- SOSR 2017 (ACM Symposium on SDN Research)
- HotNets 2013 (ACM Workshop on Hot Topics in Networks)

National Science Foundation panelist:

- NSF CSR 2016 (Computer Systems Research)
- NSF SaTC 2015 (Secure and Trustworthy Cyberspace)

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

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Departmental Activities	<ul style="list-style-type: none"><li>• Co-founder of GTRG, a game theory reading group for the Computer Science Department (see <a href="https://www.cs.umd.edu/~dml/gtrg.html">https://www.cs.umd.edu/~dml/gtrg.html</a>).</li><li>• Elected member of the Computer Science Department's Education Committee, 2005 – 2006.</li><li>• President of the Executive Council, the graduate student governing body for promoting interaction among students and faculty in the computer science department, 2004 – 2005.</li></ul>	
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Invited Talks	<p><i>Securing the Internet by Proving the Impossible</i></p> <ul style="list-style-type: none"><li>• University of Jordan. Hosted by Khair Eddin</li></ul>	September 2016
	<p><i>Key Mismanagement in the Webs PKI</i></p> <ul style="list-style-type: none"><li>• CloudFlare. Hosted by Nick Sullivan</li><li>• NEC Labs. Hosted by Cristian Lumezanu</li></ul>	August 2016 July 2016
	<p><i>The Ugly Truth about Certificate Revocation</i></p> <ul style="list-style-type: none"><li>• Maryland Cybersecurity Center Symposium</li><li>• ICF Internationals CyberSci Summit</li><li>• Duke University. Hosted by Theo Benson</li></ul>	December 2015 October 2015 August 2014
	<p><i>Alibi Routing</i></p> <ul style="list-style-type: none"><li>• SIGCOMM Conference</li></ul>	August 2015
	<p><i>Maritime Cybersecurity</i></p> <ul style="list-style-type: none"><li>• National Maritime Electronics Association (NMEA) Conference</li></ul>	October 2015
	<p><i>Analysis of SSL Certificate Reissues and Revocations in the Wake of Heartbleed</i></p> <ul style="list-style-type: none"><li>• NANOG 62 (Security track). Baltimore, MD</li></ul>	October 2014
	<p><i>D-mystifying the D-root Address Change</i></p> <ul style="list-style-type: none"><li>• NANOG 62 (DNS track). Baltimore, MD</li></ul>	October 2014
	<p><i>Tune-in to Tune-out: Using FM radio to revoke certificates</i></p> <ul style="list-style-type: none"><li>• Maryland Cybersecurity Center Symposium</li></ul>	May 2014
	<p><i>Avoiding Censors by Proving the Impossible</i></p> <ul style="list-style-type: none"><li>• Laboratory for Telecommunication Sciences (LTS) Symposium</li></ul>	March 2014
	<p><i>Proving the Impossible with Alibi Protocols</i></p> <ul style="list-style-type: none"><li>• Maryland Cybersecurity Center (MC2) Symposium</li></ul>	May 2013
	<p><i>Systems without Cooperation</i></p> <ul style="list-style-type: none"><li>• William and Mary College.</li><li>• Stanford University Networking Seminar.</li><li>• Georgia Tech. Hosted by Nick Feamster.</li><li>• University of Wisconsin-Madison. Hosted by Suman Banerjee.</li></ul>	April 2013 July 2009 December 2008 December 2008
	<p><i>Making Currency Cheap with iOwe</i></p> <ul style="list-style-type: none"><li>• NetEcon Workshop</li></ul>	July 2011

- Stay or Go? Participation in Under-provisioned Multicast Systems*  
 • NetEcon Workshop July 2009
- Systems-Compatible Incentives*  
 • GameNets Conference May 2009
- TrInc: Small Trusted Hardware for Large Distributed Systems*  
 • NSDI Conference April 2009
- BitTorrent Is an Auction: Analyzing and Improving BitTorrent's Incentives*  
 • SIGCOMM Conference August 2008
- Motivating Participation in Internet Routing Overlays*  
 • NetEcon Workshop August 2008
- Boycotting and Extorting Nodes in an Internetwork*  
 • NetEcon Workshop June 2007
- Punishment in Selfish Wireless Networks*  
 • NetEcon Workshop June 2006
- Fair File Swarming with FOX*  
 • IPTPS Workshop February 2006  
 • University of Delaware. Hosted by Paul Amer. September 2005

Professional  
Experience

**University of Maryland**, College Park, MD USA

*Assistant Professor*

**Beginning 2017**

Starting January 2017, I will be an assistant professor, with a focus on systems and network security. I will also continue serving as a co-chair of the Computer Science Undergraduate Honors program.

**University of Maryland**, College Park, MD USA

*Assistant Research Scientist*

**2012 – present**

Performed and advised research in a wide range of networked systems and security I also taught 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.