

# THOMAS MOYER

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Secure, Resilient Systems and Technology  
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## EDUCATION

### **The Pennsylvania State University**

University Park, PA

PhD, Computer Science and Engineering, December 2011

Advisor: Dr. Patrick D. McDaniel

Dissertation Title: *Building Scalable Document Integrity Systems*

### **The Pennsylvania State University**

University Park, PA

MS, Computer Science and Engineering, 2009

Advisor: Dr. Patrick D. McDaniel

Thesis Title: *Scalable Web Content Attestations*

### **The Pennsylvania State University**

University Park, PA

B.S., Computer Engineering, 2006

## INDUSTRIAL APPOINTMENTS

### **Research Scientist**, September 2011 to Present

*Cyber Systems and Technology Group*, MIT Lincoln Laboratory, Lexington, MA

Worked on secure system design and prototyping.

Developed prototype for protected, mobile, satellite communications terminal, including addressing information assurance requirements for multiple organizations.

Developed understanding of certification and accreditation processes used to certify information systems.

Participated in blue-team threat assessment for legacy computer systems.

Supported DoD ASD(R&E) Information Systems and Cyber Technologies office as subject matter expert in cyber security.

Developed secure data provenance architectures for large-scale enterprise systems.

### **Summer Research Intern AT&T**, Summer 2007

*Internet and Networking Systems Research Center*, AT&T Labs Research, Florham Park, NJ

Mentor: Dr. Subhabrata Sen

Worked on problems in configuration management.

Assisted in developing internal tool for creating configurations.

### **Systems Administrator**, March 2004 to Summer 2007

*Geodynamics Research Group*, The Pennsylvania State University, University Park, PA

Supervised by Dr. Kevin Furlong

Responsible for maintaining and upgrading systems and infrastructure.

Implemented an automated, platform independent, remote backup system.

Assisted with some minimal scientific programming for research.

## ACADEMIC APPOINTMENTS

### **Research Assistant**, Summer 2008 to Fall 2011

*The Pennsylvania State University*, University Park, PA

Advisor: Dr. Patrick D. McDaniel

Worked on problems in virtual machine security.

Utilized technologies for virtualization and trusted hardware to develop secure computing applications.

Worked on problems in Web security.

**Research Assistant**, Fall 2007 to Spring 2008

*The Pennsylvania State University*, University Park, PA

Advisor: Dr. Patrick D. McDaniel

Mentor: Dr. Subhabrata Sen

Worked on problems in configuration management.

Assisted in developing/testing tool for creating router configurations.

**Instructor**, Spring 2007

*The Pennsylvania State University*, University Park, PA

Department of Computer Science Engineering, Pennsylvania State University

Introduction to Algorithmic Processes (CMPSC 101)

Instructed students in program design and creation using the MS Visual Basic programming language.

## PROFESSIONAL ACTIVITIES

### Organizing Committee

*2017*: IEEE Symposium on Security and Privacy (Oakland)

*2016*: Annual Computer Security Applications Conference (ACSAC)

*2015*: Annual Computer Security Applications Conference (ACSAC)

### Program Committee

*2017*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

*2016*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES), MILCOM

*2015*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

*2014*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

*2013*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

*2012*: Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

### Reviewer (Years removed for brevity)

IEEE Symposium on Security and Privacy (Oakland)

Annual Computer Security Applications Conference (ACSAC)

ACM Computer and Communications Security Conference (CCS)

USENIX Workshop on Hot Topics in Security (HotSec)

ACM Symposium on Access Control Models and Technologies (SACMAT)

ACM Transactions on Internet Technology (TOIT)

IEEE Transactions on Software Engineering (TSE)

Springer-Verlag Transactions on Computational Science (TCS)

IEEE Security and Privacy Magazine(S&P)

International Conference on Information Security and Assurance (ISA)

USENIX Security Symposium (USENIX Security)

International Conference on Information Systems Security (ICISS)

ACM Cloud Computing Security Workshop (CCSW)

Packt Publishing

Workshop on Virtual Machine Security (VMSec)

Wiley Software Practiec and Experience (SPE)

## COMPUTING SKILLS

**Programming Languages** - C, C++, Java, Python, Perl, PHP, JavaScript

**Operating Systems** - Linux, IBM AIX, MS Windows, Sun Solaris, Mac

**Other Applications** - Matlab, Maxima, Maple, Mathematica

## PUBLICATIONS

### Journal Publications

1. T. Moyer et al. “Scalable Web Content Attestation”. In: *IEEE Transactions on Computers* 61.5 (May 2012), pp. 686–699. DOI: 10.1109/tc.2011.60. URL: <http://dx.doi.org/10.1109/TC.2011.60>
2. Joshua Schiffman et al. “Network-based Root of Trust for Installation”. In: *IEEE Security & Privacy Magazine* (Jan. 2011)
3. Kevin Butler et al. “New Security Architectures Based on Emerging Disk Functionality”. In: *IEEE Security & Privacy Magazine* (Sept. 2010)
4. William Enck et al. “Configuration Management at Massive Scale: System Design and Experience”. In: *IEEE Journal on Selected Areas in Communications (JSAC)* (Apr. 2009)

### Conference Publications

5. Nabil Schear et al. “Bootstrapping and Maintaining Trust in the Cloud”. In: *Proceedings of the 32nd Annual Computer Security Applications Conference*. ACSAC 2016. Los Angeles, CA, USA: ACM, Dec. 2016, pp. 1–10. ISBN: 978-1-4503-3682-6. DOI: 10.1145/2818000.2818003. URL: <http://doi.acm.org/10.1145/2818000.2818003>
6. Thomas Moyer et al. “Leveraging Data Provenance to Enhance Cyber Resilience”. In: *1st IEEE Cybersecurity Development (SecDev)*. Nov. 2016
7. Thomas Moyer and Vijay Gadepally. “High-throughput Ingest of Data Provenance Records into Accumulo”. In: *2016 IEEE High Performance Extreme Computing Conference, HPEC*. Sept. 2016
8. Adam Bates et al. “Trustworthy Whole-System Provenance for the Linux Kernel”. In: *24th USENIX Security Symposium (USENIX Security 15)*. Washington, D.C.: USENIX Association, Aug. 2015. URL: <https://www.usenix.org/conference/usenixsecurity15/technical-sessions/presentation/bates>
9. Thomas Moyer, Trent Jaeger, and Patrick McDaniel. “Scalable Integrity-Guaranteed AJAX”. in: *Proceedings of the 14th Asia-Pacific Web Conference (APWeb)*. Kunming, China, Apr. 2012
10. Boniface Hicks et al. “An Architecture for Enforcing End-to-End Access Control Over Web Applications”. In: *Proceedings of the 2010 Symposium on Access Control Models and Technologies, SACMAT '10*. June 2010
11. Thomas Moyer et al. “Scalable Web Content Attestation”. In: *ACSAC '09: Proceedings of the 2009 Annual Computer Security Applications Conference*. acceptance rate=19.0%. Dec. 2009
12. Joshua Schiffman et al. “Justifying Integrity Using a Virtual Machine Verifier”. In: *Proceedings of the 2009 Annual Computer Security Applications Conference, ACSAC '09*. acceptance rate=19.0%. Dec. 2009

### Workshop Publications

13. Adam Bates, Kevin R.B. Butler, and Thomas Moyer. “Take Only What You Need: Leveraging Mandatory Access Control Policy to Reduce Provenance Storage Costs”. In: *7th USENIX Workshop on the Theory and Practice of Provenance (TaPP 15)*. Edinburgh, Scotland: USENIX Association, July 2015. URL: <https://www.usenix.org/conference/tapp15/workshop-program/presentation/bates>

14. Joshua Schiffman et al. “Seeding Clouds with Trust Anchors”. In: *CCSW '10: Proceedings of the 2010 ACM workshop on Cloud computing security*. ACM, Oct. 2010

## Technical Reports

15. Adam Bates et al. “Retrofitting Applications with Provenance-Based Security Monitoring”. <https://arxiv.org/abs/1609.00266>. Sept. 2016
16. Thomas Moyer and Patrick McDaniel. *Scalable Integrity-Guaranteed AJAX*. tech. rep. NAS-TR-0149-2011. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Mar. 2011
17. Thomas Moyer. *USENIX Security Symposium Session Summaries*. ;login: The USENIX Magazine. Aug. 2010
18. Thomas Moyer. *USENIX Conference on Web Application Development Session Summaries*. ;login: The USENIX Magazine. Oct. 2010
19. Joshua Schiffman et al. *Seeding Clouds with Trust Anchors*. Tech. rep. NAS-TR-0127-2010. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Apr. 2010
20. Kevin Butler et al. *Firma: Disk-Based Foundations for Trusted Operating Systems*. Tech. rep. NAS-TR-0114-2009. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Apr. 2009
21. Joshua Schiffman et al. *No Node Is an Island: Shamon Integrity Monitoring Approach*. Tech. rep. NAS-TR-0103-2009. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Feb. 2009
22. Kevin Butler et al. *SwitchBlade: Policy-Driven Disk Segmentation*. Tech. rep. NAS-TR-0098-2008. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Nov. 2008
23. Thomas Moyer et al. *Scalable Asynchronous Web Content Attestation*. Tech. rep. NAS-TR-0095-2008. Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA: Network and Security Research Center, Sept. 2008

## Invited Talks and Presentations

24. “Leveraging Data Provenance to Enhance Cyber Resilience”. Boston, MA, Nov. 2016
25. “Building Resilient Systems with Secure End-to-End Data Provenance”. Storrs, CT, Oct. 2016
26. “High-throughput Ingest of Data Provenance Records into Accumulo”. Waltham, MA, Sept. 2016
27. “Building Resilient Systems with Secure End-to-End Data Provenance”. Lexington, MA, June 2016
28. “Scalable Web Content Attestation”. Lexington, MA, Jan. 2011
29. “Building Document Integrity Systems”. University Park, PA, Aug. 2011
30. “Scalable Web Content Attestation”. Honolulu, HI, Dec. 2009
31. “Scalable Web Content Attestation”. University Park, PA, May 2009