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Cambridge, MA 02141

EDUCATION:

Ph.D. Electrical Engineering – Princeton University, June 2010
Princeton, NJ, Department of Electrical Engineering, Graduate School
Ph.D. Program in Computer Engineering, Research Advisor: Ruby B. Lee
Dissertation title: *Securing the Use of Sensitive Data on Remote Devices Using a Hardware-Software Architecture*

M.A. Electrical Engineering – Princeton University, November 2004

B.S. Computer Engineering – Rutgers University, May 2002
Piscataway, NJ, School of Engineering, Honors Program,
GPA. 3.846, Major GPA 3.91, Graduated with Highest Honors

GRADUATE COURSEWORK:

Domestic Policy Analysis	Great Moments in Computing	Switching and Sequential Systems
Privacy: Technology and Policy	Processor Arch for New Paradigms	Linear Systems Theory
Information Technology & the Law	Computer Architecture	Low Power Design
Information Security	Parallel Arch & Programming	Compiling Techniques

UNDERGRADUATE COURSEWORK (G – Graduate Course):

Testing of ULSI Circuits (G)	Operating Systems Design	Visualization and Advanced Computer Graphics (G)
Intro to VLSI Design	Distributed Systems	Robotics and Computer Vision

CURRENT RESEARCH INTERESTS:

Trusted Computing, Computer/System Security, Operating System & Application Security, Malicious Software/Malware, Computer Architecture, Virtual Machines, Privacy Technology

TECHNICAL & RESEARCH EXPERIENCE:

Elysium Digital – Computer Scientist, Cambridge, MA – 2010-Present
- Intellectual property litigation consulting

Princeton University – PALMS Lab Research Assistant, Princeton, NJ – 2002-2010
Research Advisor: Ruby B. Lee
- Designed new security techniques and computer architecture for the Secret Protection (SP) architecture
- Developed hardware protection mechanisms for remote and transient trust scenarios to protect applications from malicious software and untrusted operating systems
- Extended remote trust architecture to provide security and key-management on low-cost sensor-nodes
- Collaborated on SecureCore project, integrating SP arch. with separation kernels and virtual machines, and providing containment of emergency-management data with mandatory access control policies
- Designed and implemented a testing framework, extending the VMware virtual machine monitor to emulate new security hardware features in the virtual processor and to control a system under test to perform controlled security attacks and monitor the effects on the system

VMware Inc. – Research & Development, Security Group, Palo Alto, CA – Summer 2007
Overshadow project. Mentor: Mike Chen
- Developed and implemented new security techniques in virtual machine monitors
- Benchmarked server and application software on new virtual machine security platform

Hewlett Packard, Research Labs – Systems Security Lab, Princeton, NJ – Summer 2004
Privacy and Auditing Systems. Mentors: Bill Horne, Tomas Sander

- Evaluated privacy policies and policy enforcement techniques for electronic medical records
- Designed and implemented auditing technologies for analysis and enforcement of privacy policies

Morgan Stanley – IT Department, Fax & Messaging, New York, NY – Summer 2002
- Developed new client and server software to replace mainframe-based fax distribution system, maintaining compatibility with legacy systems
- Deployed new fax software in mission-critical systems

Microsoft – Windows Media Platform Group, Digital Media Division, Redmond, WA – Summer 2001
Software Development Engineer in Test, Summer Intern.
Mentors: Michael Posluszny, Xiao Hong Jia, Cesar Garcia
- Developed test automation mechanisms using VBScript and COM objects for Windows Media Player 9
- Developed test suites for network features and SDMI functionality in Windows Media Player

Rutgers University – Independent work – 2001-2002
Independent work on computer graphics – Advisor: Deborah Silver
Independent research on VLSI testing – Advisor: Michael Bushnell

Department of Defense, US Army, Information Security Lab, Fort Monmouth, NJ – Summer 2000
- Evaluated network and host-based intrusion detection systems
- Evaluated Cisco router and firewall configurations
- Designed network architecture and routing configurations for simulated battlefield network

Faradic Internet Services – Co-Founder and Executive Vice President, Little Silver, NJ – 1997-2009
- Co-founded Limited Liability Company as a local Internet Service Provider and web host
- Managed and maintained a variety of Linux servers, ISDN modem pool, and T1 internet connectivity
- Managed technical support, customer service, sales, billing, accounting, and corporate finances
- Managed vendor relationships and contracts, network monitoring, denial of service, and fraud detection

RELEVANT SKILLS:

Security & Privacy (Applications of Cryptography, Security Design, Analysis & Research, Trusted Computing, Threat Models, Malware and Malicious Software, Privacy Policies, Privacy Enforcement and Auditing Systems, etc.)
Computer Architecture (Architecture for Security, Instruction Set Architecture Design, Virtual Machine Architectures, Simulation – SimpleScalar, etc.)
Programming (C, C++, Java, Java RMI, Perl, SQL Databases, Perl DBI, Bash/Shell Scripting, XML, VHDL, Matlab, Turbo Pascal, Visual Basic, VBScript, MIPS Assembly Language, HTML, CSS, CGI, SSI, etc.)
Operating Systems, Servers & Applications (DOS, Windows 3.11/95/98/ME/NT/2000/XP, Linux, SunOS, MacOS, Cisco IOS, X Windows, Microsoft Office, Adobe Photoshop, QuickBooks, etc.)
Internet Networking (Network Design, Ethernet, TCP/IP, routing, proxy servers, PPP, etc.)
Network & System Security (Router Access-Lists, Firewalls, Content-Based Access Control (CBAC), Intrusion Detection Systems (IDS), Network Monitoring, Spam, Viruses, Digital Rights Management, Denial of Service, Fraud Detection and Handling)
Business & Customer Relations (Technical and Non-Technical Support, Sales, Contract Management, In-person Instruction, Record Keeping, Business Finance, Industry Awareness, etc)
VLSI (Cadence Design System (Virtuoso Schematic & Layout Editor, Verilog XL, Spectre Simulation), Synopsis Synthesis System & VHDL)

TEACHING EXPERIENCE

Assistant in Instruction. ELE 386 – Cyber Security. Spring 2005 & Spring 2006
Professor Ruby B. Lee, Department of Electrical Engineering, Princeton University

ACTIVITIES (Princeton):

Graduate Student Government –
Treasurer & Executive Committee
Council of the Princeton University Community –
Graduate Student Representative
CPUC Priorities Committee Member –
(advises on the University operating budget)
Various other policy & advisory committees
Center for Information Technology Policy

HONORS AND ACTIVITIES (Rutgers)**:**

School of Engineering Honors Program
College of Engineering Dean's List
Edward J. Bloustein Distinguished Scholar
Outstanding Scholar Recognition Program Scholarship
Engineering Governing Council Member
Golden Key National Honor Society Member
Eta Kappa Nu Executive Board Member
IEEE Executive Board Member

PUBLICATIONS & PATENTS:

Dahai Xu, **Jeffrey Dwoskin**, Jianwei Huang, Tian Lan, Ruby Lee, Mung Chiang. "Key Management in Sensor Networks". Book chapter, *Theoretical Aspects of Distributed Computing in Sensor Networks,* Springer Verlag, November, 2009. *In submission.*

Ruby B. Lee, **Jeffrey S. Dwoskin**. "Hardware Trust Anchors in SP-Enabled Processors", U.S. Patent Application – filed August 14, 2009.

Timothy Levin, **Jeffrey S. Dwoskin**, Ganesha Bhaskara, Thuy Nguyen, Paul Clark, Ruby B. Lee, Cynthia Irvine, Terry Benzel. "Securing the Dissemination of Emergency Response Data with an Integrated Hardware-Software Architecture," *2nd International Conference on Trusted Computing (TRUST 2009)*, Oxford, U.K., April 2009.

Xiaoxin Chen, Tal Garfinkel, E. Christopher Lewis, Pratap Subrahmanyam, Carl A. Waldspurger, Dan Boneh, **Jeffrey S. Dwoskin**, Dan R. K. Ports, "Overshadow: A Virtualization-Based Approach to Retrofitting Protection in Commodity Operating Systems," *Proc. of the Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2008.

Dahai Xu, Jianwei Huang, **Jeffrey Dwoskin**, Mung Chiang, Ruby Lee, "On Secure Key Management in Mobile Ad Hoc Networks," 2008. *Journal paper, in submission to IEEE Transactions on Mobile Computing*

Jeffrey S. Dwoskin and Ruby B. Lee, "Hardware-rooted Trust for Secure Key Management and Transient Trust," *Proc. of the 14th ACM Conference on Computer and Communications Security (CCS 2007)*, pp. 389-400, October 2007.

Jeffrey Dwoskin, Dahai Xu, Jianwei Huang, Mung Chiang, and Ruby B. Lee, "Secure Key Management Architecture Against Sensor-node Fabrication Attacks." *IEEE GlobeCom 2007*, Washington, DC, November 2007

Dahai Xu, Jianwei Huang, **Jeffrey Dwoskin**, Mung Chiang, and Ruby Lee, "Re-examining Probabilistic Versus Deterministic Key Management," *IEEE International Symposium on Information Theory (ISIT'07)*, Nice, France. 2007.

Ruby B. Lee, Peter C. S. Kwan, John Patrick McGregor**, Jeffrey Dwoskin**, and Zhenghong Wang, "Architecture for Protecting Critical Secrets in Microprocessors," *Proceedings of the 32nd International Symposium on Computer Architecture (ISCA 2005)*, pp. 2-13, Madison, Wisconsin, June 2005.

Jeffrey Dwoskin, Sujoy Basu, Vanish Talwar, Raj Kumar, Fred Kitson, and Ruby Lee, "Scoping Security Issues for Interactive Grids," *Proceedings of the 37th Asilomar Conference on Signals, Systems, and Computers*, pp. 367-373, November 9-12, 2003.

TECHNICAL REPORTS:

Yu-Yuan Chen, **Jeffrey S. Dwoskin**, Mahadevan Gomathisankaran, Ruby B. Lee. "Making Security Validation as Easy as Performance Evaluation", *Princeton University Department of Electrical Engineering Technical Report CE-L2009-005*, November, 2009. *(To be submitted)*

Jeffrey Dwoskin, Mahadevan Gomathisankaran, David Champagne, Ruby B. Lee, "SP Reference Manual Addendum – Secure Stacks for TSMs and Emulation of SP Interrupt Protection," *Princeton University Department of Electrical Engineering Technical Report CE-L2009-006*. August, 2009.

Jeffrey S. Dwoskin, Mahadevan Gomathisankaran, Ruby B. Lee. "A Framework for Testing Hardware-Software Security Architectures", *Princeton University Department of Electrical Engineering Technical Report CE-L2009-001,* Feb 04, 2009.

Jeffrey S. Dwoskin, Mahadevan Gomathisankaran, Ruby B. Lee. “Framework for Design Validation of Security Architectures,” *Princeton University Department of Electrical Engineering Technical Report CE-L2008-013*, November 2008.

Jeffrey Dwoskin, Ganesha Bhaskara, Thuy D. Nguyen, Ruby Lee, “SecureCore Prototype/Demo Manual,” Version 1.0. *Princeton University Department of Electrical Engineering Technical Report CE-L2008-009*, 8/11/2008.

Jeffrey Dwoskin, Ruby B. Lee, “SP Processor Architecture Reference Manual,” *Princeton University Department of Electrical Engineering Technical Report CE-L2008-008*, 8/11/2008. (Previous version: CE-L2007-009. Version 0.7, 11/21/2007)

Jeffrey Dwoskin, Ruby B. Lee, “Processor Architecture for Remote, Transient, Policy-controlled Secrets,” *Princeton University Department of Electrical Engineering Technical Report CE-L2006-007*, November 2006.

Ganesha Bhaskara, Timothy E. Levin, Thuy D. Nguyen, Cynthia E. Irvine, Terry V. Benzel, **Jeffrey Dwoskin,** Ruby B. Lee, “Virtualization of a Processor-based Crypto-Protection Mechanism and Integration within a Separation Kernel Architecture,” *Princeton University Department of Electrical Engineering Technical Report CE-L2006-006*, November 2006.

Ruby B. Lee, **Jeffrey Dwoskin**, David Champagne, “Fundamental Architectural Features in SP Processors for Protecting Sensitive Information,” 2006. *Unpublished.*

Jeffrey Dwoskin, Ruby B. Lee, “Enabling Transient Access to Protected Information for Crisis Response,” *Princeton University Department of Electrical Engineering Technical Report CE-L2006-001*, May 2006.