

# Sarah M. Diesburg

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## Educational Background

### Degrees:

*Ph.D.* Computer Science, Florida State University, Fall 2010 (expected), GPA: 3.98/4.0

*M.S.* Information Security, Florida State University, August 2008, GPA: 3.98/4.0

*B.S. magna cum laude*, Computer Science, University of Northern Iowa, December 2004, GPA 3.59/4.0

## Dissertation

**Title:** TrueErase: Full-Datapath Secure Deletion on Electronic Storage

**Advisor:** Dr. An-I Andy Wang

Many operating system storage-datapath components can get in the way of per-file secure deletion, such as file system journaling, buffering, and storage abstractions like the NAND flash translation layer. I am designing and implementing a secure deletion framework that may be used with any file system and storage device to achieve per-file secure deletion. This framework is compatible with the legacy storage-datapath and works transparently with current user delete commands.

## Research and Major Projects

- **Graduate Research Assistantship in Secure Storage**, Florida State University, Tallahassee, Florida, 2005-present. Explored secure and swift deletion file system paradigms. Examined two-time-pad weaknesses of certain encryption modes in the context of storage implementations. Currently investigating future secure storage and deletion methods with NAND-based flash media.
- **Security Kernel Module project in kernel/device drivers class (2006)**. We built *Guardian*, a Linux 2.6 kernel module that cloaks, prevents or alerts modifications or misuses of the system call table, checks for other cloaked modules, and checks the integrity of other currently loaded modules.
- **Network Vulnerability Scanner project in advanced Unix programming class (2005)**. We built a network vulnerability scanner similar to Nessus, which scans a host's ports, attempts to grab service banners to deduce service version/OS type, and automatically tests the vulnerability on the host.
- **Undergraduate Research Assistantship**, University of Northern Iowa, Cedar Falls, Iowa, 2003-2004. Developed new application packages, configured new boot-up modes and scripts, co-authored papers, and maintained various parts of the Bootable Cluster CD (BCCD) project, which is a clustering/parallel-computing operating system on a CD.
- **Intrusion Detection System undergraduate senior project (2004)**. I set up and used the Snort intrusion detection system to monitor and compare traffic on a major university network against global traffic patterns. I was able to predict ports with service vulnerabilities based on abnormal traffic patterns.

## Teaching/Other Work Experience

- **Information Security Auditor**, Southeastern Community Blood Center, Tallahassee, Florida, 2008. Evaluated a medium-sized organization against the BS7799.2 security policy audit checklist, tested employees' resistance to social engineering, verified HIPPA compliance, and examined network vulnerability.
- **Lead Lecturer**, Florida State University, Tallahassee, Florida, 2008. Taught the Mac computer literacy course, both online and classroom edition. Supervised 200 online students, 3 class graders, and 2 recitation instructors. Prepared and delivered weekly lectures to 40 classroom students.
- **Teaching Assistant**, Florida State University, Tallahassee, Florida, 2007. Taught the PC computer literacy recitation and assisted with administrative duties.

- **Part-Time Web Developer**, Dyton Creative, Cedar Falls, Iowa, 2002-2003. Built educational online learning centers and interactive textbook CDs. Changed manual document conversion process to automatic by using perl and bash scripts.

## Publications

- Sarah Diesburg and An-I Andy Wang. A Survey of Confidential Data Storage and Deletion Methods. *ACM Computing Surveys*, to appear.
- Sarah Diesburg, Christopher Meyers, David Lary, and An-I Andy Wang. When cryptography meets storage. In *Proceedings of the 4th ACM international Workshop on Storage Security and Survivability*, Alexandria, Virginia, USA, October, 2008.
- Sarah Diesburg, Paul Gray, and David Joiner. High Performance Computing Environments Without the Fuss: The Bootable Cluster CD. *Proceedings of the 19th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, April 2005.
- Sarah Diesburg. Monitoring Network Sludge: Using Intrusion Detection to Monitor Network Traffic. Technical Report, University of Northern Iowa, December 2004.
- Paul Gray and Sarah Miller (Diesburg). In Search of Clusters for High Performance Computing Education. *Proceedings of the Linux Clusters Institute Conference*, May 2004.
- Paul Gray and Sarah Miller (Diesburg). The Bootable Cluster CD for High Performance Computing Education. *Proceedings of the Midwest Instruction and Computing Symposium*, April 2004.

## Presentations

- Sarah Diesburg. TrueErase: Secure Deletion on Flash Storage. Presented at the Feed Your Brain Symposium at the Florida State University College of Communication and Information, November 2009.
- Sarah Diesburg. TrueErase: Secure Deletion on Electronic Media, FSU Board of Trustees, August 2009.
- Sarah Diesburg. Full-Datapath Secure Deletion, Work-in-Progress Report, *The 18<sup>th</sup> USENIX Security Symposium*, August 2009.
- Sarah Diesburg. Full-Datapath Secure Data Deletion, Invited Talk, University of Northern Iowa, May 2009.
- Sarah Diesburg. Full-Datapath Secure Data Deletion, FSU ACM Student Research Conference, April 2009.
- Guest Lecture, Criminal Justice Responses to Cybercrime, Florida State University, April 2009.
- Sarah Diesburg, When Cryptography Meets Storage, in *The 4<sup>th</sup> International Workshop on Storage Security and Survivability (StorageSS)*, October 2008.
- Sarah Diesburg. Organizing a Computing Mentorship for Middle School Students: What Did I Get Myself Into? In *Students & Technology in Academia, Research & Service Summer Workshop 2007*, August 2007.

## Posters

- Sarah Diesburg. Full-Datapath Per-file Secure Deletion. Submitted to the *2010 Grace Hopper Celebration* to be considered in the ACM Student Research Competition, September 2010.
- Kristin Norena, Sabrina Fontaine, Matthew Small, April Johnson, Monika Achury, and Sarah Diesburg. CCN on the Road. *STARS Summer Workshop, August 2008*.
- Sarah Diesburg. Organizing a Computing Mentorship for Middle School Students. *STARS Summer Workshop, August 2007*. (2nd place in the retention category)
- Johnnie Birch, Sarah Diesburg, Corey Latislaw, Anthony Miller, and Sharon Wynn. Florida State University's Bridging with Big Bend Gifted Students. *STARS Summer Workshop, August 2006*.
- Paul Gray, David Joiner, and Sarah Diesburg. The Bootable Cluster CD. *Oklahoma Supercomputing Symposium*, October 2004.

## Press Coverage

- Kaylani Levine. Florida State Standouts: Sarah Diesburg. Florida State Headlines, October 13, 2009. <http://www.fsu.com/Radio-News/Florida-State-Standouts-Sarah-Diesburg>
- Doug Blackburn. FSU student tackles 'flash' issues, Tallahassee Democrat, front page article, October 4th, 2009. <http://pqasb.pqarchiver.com/tallahassee/access/1871784351.html?FMT=ABS&date=Oct+04,+2009>
- Doug Blackburn. FSU student develops software prototype to erase electronic files, Tallahassee Democrat, October 3, 2009. <http://pqasb.pqarchiver.com/tallahassee/access/1871398611.html?FMT=ABS&date=Oct+03,+2009>
- Florida State University Star Student designation, profile, October 1<sup>st</sup>, 2009. <https://campus.fsu.edu/profiles/diesburg/>
- Susan Hellstrom. Florida State Doctoral Students Win Top Research Scholarships, May 2nd, 2009. <http://www.fsu.com/News-Archive/2009/May2/Florida-State-Doctoral-Students-Win-Top-Research-Scholarships>

## Graduate Coursework

- Computer and Network Administration
- Analytic Methods
- Cryptography
- Advanced Unix Programming
- Software Engineering
- Computer Security
- Theory of Automata and Formal Languages
- Kernel/Device Drivers
- Computer Architecture
- Network Security
- Operating Systems

## Service

- **ACM Programming Contest**, developed two out of six questions used in the annual FSU ACM Programming Contest, March 2010.
- **Panel Participant**, FSU Graduate Research & Creativity Award, March 2010.
- **Panel Participant**, FSU Workshop for Undergraduates Interested in Graduate School, March 2010.
- **Secretary/Webmaster**, ACM-Women, Florida State University, 2009-2010. Invited two business women to give talks and advice in our "Tech Talk" series.
- **Shadow PC**, 22<sup>nd</sup> ACM Symposium on Operating System Principles, May 2009
- **Student Participant**, Revitalizing Computer Science Education Through the Science of Digital Media, Workshop 3, Florida State University, April 2009
- **President**, Women in Computer Science, converted to ACM-Women, Florida State University, 2008-2009
- **Secretary**, FSU Student Leadership Corps STARS Alliance, 2007-2008
- **Secretary**, Women in Computer Science, Florida State University, 2007
- **Scribe**, the 21<sup>st</sup> ACM Symposium on Operating Systems Principles, 2007
- **Scribe**, the 16<sup>th</sup> USENIX Security Symposium, 2007
- **Logistical Coordinator** (2007), **Logistical Assistant** (2006), STARS Computing Careers Night. Led and assisted with the logistical preparation team for this event, which was part of a NSF initiative to broaden participation in computing. Introduced high school students, their parents, and guidance counselors to computing careers and education.
- **Mentor**, STARS, 2006. Mentored middle-school gifted students from the School of Arts and Science, as part of a NSF initiative to broaden participation in computing. Assisted local middle-school students in making interactive games and movies using the Alice 3D programming environment.
- **Vice President**, Cedar Valley Linux Users Group, University of Northern Iowa, 2003-2004
- **President** (2004), **Vice President** (2003), **Secretary** (2002), UNI Computer Club

## Honors and Awards

- Philanthropic Educational Organization (P.E.O.) Scholar Award, 2009

- Student Travel Grant to attend Grace Hopper Celebration of Women in Computing, 2009
- Student Travel Grants to attend the 16<sup>th</sup> and 18<sup>th</sup> USENIX Security Symposiums, 2007 and 2009
- Department of Education Graduate Assistance in Areas of National Need Fellowship, 2006-2008
- National Science Foundation (NSF) Student Travel Grant to attend the 21st ACM Symposium on Operating Systems Principles 2007
- Student Travel Grant to attend Students & Technology in Academia, Research & Service (STARS) Summer Workshop 2007
- Student Travel Grant to attend STARS Summer Workshop 2006
- NSF Computer Science, Industrial Technology, or Mathematics Scholarship, University of Northern Iowa, 2002-2004
- E. Larsen & E. Larsen Scholarship, University of Northern Iowa, 2000-2004

### **Professional Society Memberships**

- Student ACM member
- Upsilon Pi Epsilon, The International Computer Science Honorary Society
- Golden Key International Honour Society

### **References**

- **Dr. Andy Wang**, Computer Science Department, Florida State University, Tallahassee, FL 32306, (850) 645-1562, [awang@cs.fsu.edu](mailto:awang@cs.fsu.edu).
- **Dr. Paul Gray**, Computer Science Department, University of Northern Iowa, Cedar Falls, IA 50614, (319) 273-5917, [gray@cs.uni.edu](mailto:gray@cs.uni.edu).
- **Dr. Lois Hawkes**, Associate Dean, College of Arts & Sciences, 110 Longmire Building, Florida State University, Tallahassee, FL 32306, (850) 644-1083, [lhawkes@fsu.edu](mailto:lhawkes@fsu.edu).
- **Mr. Ken Baldauf**, Computer Science Department, Florida State University, Tallahassee, FL 32306, (850) 644-5832, [baldauf@cs.fsu.edu](mailto:baldauf@cs.fsu.edu).