Curriculum Vitae

Louis Kruger

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Research Interests

My primary research focus is optimization of secure function evaluation (SFE) protocols, including:

- Representation of functions that yield efficient evaluation protocols.
- Design methodologies for efficient function specific evaluation protocols.
- Evaluating potential trade-offs between privacy and performance..

Other research interests include cryptographic primitives of SFE, program security using static and dynamic analyses, and the application of statistical techniques to security.

Education

Ph.D. Computer Science, University of Wisconsin (in progress)

Anticipated graduation Dec 2010
Preliminary exam May 2007
Passed programming languages qualifying exam Sept 2004
Adviser: Professor Somesh Jha
Minor in Statistics

M.S. Computer Science, University of Wisconsin May 2004

B.S. Computer Science, Princeton University June 1997
Graduated with Honors
Certificate in Applied and Computational Mathematics

Awards

- 3rd place, First Symantec University Programming Competition, 2006
- 2004 ACM ICPC Programming Competition. 2nd place, North-Central region.
- 2003 ACM ICPC Programming Competition. 1st place, North-Central region, 30th place internationally.
- University of Wisconsin Summer Research Fellowship, 2003.

Research Experience

- Research Assistant May 2003 to Present
Professor Somesh Jha
Computer Sciences Department, University of Wisconsin

Performing graduate research in computer security and privacy, including (1) privacy preserving secure function evaluation protocols; (2) detection of anomalous behavior using statistical filtering techniques; (3) spyware prevention based on dynamic slicing of program traces.

Refereed Conference Publications

1. **Practical Privacy for Genomic Computation.**
L. Kruger, S. Jha, and V. Shmatikov.

In 29th *Annual IEEE Conference on Security and Privacy (Oakland)*. Berkeley, California, May 2008.

2. **Secure Function Evaluation with Ordered Binary Decision Diagrams.**
L. Kruger, E. Goh, S. Jha, and D. Boneh.
In 13th *Annual ACM Conference on Computer and Communication Security (CCS)*. Alexandria, Virginia, November 2006. 38 of 256 submissions accepted (15%).

3. **Strengthening Software Self-Checksumming via Self-Modifying Code.**
J. Giffin, M. Christodorescu, and L. Kruger.
In *21st Annual Computer Security Applications Conference (ACSAC).*
Tuscon, Arizona, December 2005.
45 of 197 submissions accepted (23%).

4. **An Auctioning Reputation System Based on Anomaly Detection.**
S. Rubin, M. Christodorescu, V. Ganapathy, J. Giffin, L. Kruger, H. Wang, and N. Kidd. In *12th Annual ACM Conference on Computer and Communications Security (CCS).* Alexandria, Virginia, November 2005. 38 of 250 submissions accepted (15%).

5. **Privacy Preserving Clustering.**
S. Jha, L. Kruger, and P. McDaniel.
In *European Symposium On Research In Computer Security (ESORICS).*
Milan, Italy, September 2005.
26 of 158 submissions accepted (16%)

Technical Reports

6. **Strengthening Software Self-Checksumming via Self-Modifying Code.**
J. Giffin, M. Christodorescu, and L. Kruger. *Technical report 1531,* Computer Sciences Department, University of Wisconsin. Madison, Wisconsin, September 2005.

7. **Discovering and Containing Privacy Violations in Software**
L. Kruger, H. Wang, and S. Jha. *Technical report 1515,* Computer Sciences Department, University of Wisconsin. Madison, Wisconsin, July 2004.

Work Experience

-Summer Intern. Jun 2004 - Sept. 2004
Sandia National Laboratories.
Developed functionality for BREW project (Binary REWriting Infrastructure), a core component of the Wisconsin Safety Analyzer (WiSA) to support persistence of analysis database and support multiple assembler and linker back ends. Used BREW to instrument and analyze various code. Also led a weekly seminar on static analysis.

-Sr. Software Engineer. Sept. 2001 - Feb. 2002
SAP Labs, Voice Center.
Developed processes and a build and source code control environment for team of 7 engineers and voice dialog designers. Worked on defining requirements and implementation for a voice application framework encompassing intelligent voice dialog design tools, compatibility with multiple VXML gateways, CTI integration, configuration management, and back-end
integration with SAP R/3 BAPIs.

-Sr. Software Engineer. June 2000 - July 2001
Rearden Commerce Corp.
Designed and implemented telephony and speech recognition applications for customer service and partner procurement interactions. The applications supported a call center with 500 beta test customers and 5 agents.

-Sr. Software Engineer. Oct. 1997 - June 2000
Marimba, Inc.
Defined requirements, designed, implemented, and maintained the Castanet Packaging Suite through 4 releases. The application enabled flexible and scalable network installation and maintenance of software on end hosts.

-Software Development Engineer Intern. May 1996-Sept. 1996
Microsoft Corp. Research, Speech Recognition group.
Wrote code to perform experiments on the effect of various processing techniques on speech recognition accuracy. Efforts included representing speech patterns using quinphones (phonemes with 2 context phones on each side), and the effect of including special word barrier marker in the training set. The experiments resulted in data on percent change in recognition accuracy.

-Software Development Engineer Intern. May 1995-Sept. 1995
Microsoft Corp.

Implemented C++ class library to merge large alphabetized keyword lists in real-time, with fast searching capabilities. Wrote a control for MediaView library to browse and search these merged keyword lists. Wrote a TCP/IP transport driver for MediaView content, and integrated this driver into the search application.

Patents

1. **Method and Apparatus for Identifying Changes Made to a Computer System Due to Software Installation.**
US Patent #6,738,970.
L. Kruger, A. Mah, S. Shiao
Marimba, Inc. June 1999

2. **Method and Apparatus for Producing Instructions Describing the Removal of Updates to a Computer System**
US Patent #6,367,075.
L. Kruger, A. Mah, S. Shiao
Marimba, Inc. June 1999

Reviewing Experience

- ACM Transactions on Internet Technology (TOIT), 2007. External Reviewer.
- 13th ACM Conference on Computer and Communications Security (CCS), 2006. External reviewer.
- The 14th Annual Network & Distributed System Security Symposium (NDSS), 2007. External reviewer.
- 5th USENIX Conference on File and Storage Technologies (FAST), 2007. External reviewer.
- 15th USENIX Security Symposium, 2006. Member of Program Committee.
- 2006 IEEE Symposium on Security and Privacy. External reviewer.
- 12th ACM Conference on Computer and Communications Security (CCS), 2005. External reviewer.
- 14th USENIX Security Symposium, 2005. External reviewer.

Conference Presentations

- **Practical Privacy for Genomic Computation.**
L. Kruger, S. Jha, and V. Shmatikov.

In 29th *Annual IEEE Conference on Security and Privacy (Oakland).* Berkeley, California, May 2008.

- **Secure Function Evaluation with Ordered Binary Decision Diagrams.**
L. Kruger, E. Goh, S. Jha, D. Boneh
Jonathon T. Giffin, Somesh Jha, and Barton P. Miller. In 13*th Annual ACM Conference on Computer and Communication Security (CCS).* Alexandria, Virginia, November 2006.

- **Privacy Preserving Clustering.**
S. Jha, L. Kruger, P. McDaniel. In *European Symposium On Research In Computer Security (ESORICS).* Milan, Italy, September 2005.

Presentations for Funding Review

- **A Filtering Approach to Intrusion and Masquerade Detection**
MURI Workshop. Orlando, Florida, June 2005.

- **Discovering and Containing Privacy Violations in Software**
MURI Workshop. Pittsburgh, Pennsylvania, July 2003.