XIANG CAI

Contact Information

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Objective

- Obtain a full time job in the area of Software Engineering

Education

- **Stony Brook University**—Stony Brook, NY
  Ph.D. candidate in Computer Science(GPA:3.93/4): Sep. 2007- Present

  – Research was focused on Network Security and System Security

- **University of Sciences & Technology of China(USTC)**—Hefei, Anhui, China
  B.E. in Computer Science(GPA:3.83/4.3): Sep. 2003 - July. 2007

Technical Skills

- Programming Languages: **C/C++** (proficient, 3+ years of experience), **Java** (familiar), **python** (beginner)

- Broad and diversified background in **System Programming**, **Algorithms**, **Software Development** and **Computer Security**. Specialization in **System Security** and **Network Security**. Excellent troubleshooting/problem solving skills.

Working Experience

- **Hewlett-Packard Labs**—Princeton, NJ
  Research Associate Internship: June 2012 – August 2012
  – Conduct large scale data analysis on passive DNS traffic to find malicious command-and-control servers.

Research Projects

- **Websites fingerprinting attacks on Tor. May. 2011. [C++/Java/ruby/MYSQL]** Proposed and implemented two new website fingerprinting attacks on the Tor anonymity system. Our web page classifier was novel in that, unlike all previous classifiers, it completely ignored packet sizes. Despite its simplicity, our attack outperformed recently-published fingerprinting attacks on Tor. **Source code can be found at git@github.com:xiang-cai/fingerprinting_attack_code.git**

- **A novel machine registration procedure. Dec. 2010. [PHP/MYSQL]** Designed a novel online machine registration system. Users can register their computers to certain service providers (e.g. Banks, SNS websites) by visiting the registration website and then following specific instructions. This new process is as simple as most existing machine registration procedures yet more secure. Phishing and MITM attacks against the system are almost impossible.

- **A C library for serializable file-system accessing. Feb. 2010. [C/C++/Shell]** Proposed and implemented an easy-to-use, portable, provably-secure system for accessing UNIX file-systems without race conditions and that supported arbitrary sequences of operations within each pseudo-transaction and which had negligible overhead on a mail-server benchmark. **Source code can be found at git@github.com:xiang-cai/trace.git**

- **Race attack on Unix File-Systems. Oct. 2008. [C/Shell]** Defeated two proposed Unix file-system race condition defense mechanisms. We argued that all kernel-based dynamic race detectors must have a model of the programs they protect or provide imperfect protection. **Source code can be found at git@github.com:xiang-cai/race_attack.git**

Selected Course Projects

- **Very Simple Real File-System, Dec. 2008. [C/Kernel Programming]** Implemented a very simple file-system with a group of three people, which supported regular file operations such as create, open, close, lookup, link, delete, etc.

- **Linux Stackable File-system, Nov. 2008. [C/Kernel Programming]** Implemented a stackable file system in Linux with a group of three people, which supported transparent file integrity checking.

- **Adding A System Call To The Linux Kernel, Oct. 2008. [C/Kernel Programming]** Implemented a system call by adding a module to the Linux kernel (2.6.3.26), which can insert and delete data at user specified positions within a regular file.

- **WEP Cracking Project, Dec. 2007. [Java/C]** Hacked and broke into a 128 bit WEP protected wireless network by sniffing the headers of the packets being transmitted.

Invited Talks

- **Touching from a Distance: Website Fingerprinting Attacks and Defenses.** Xiang Cai, Xincheng Zhang and Rob Johnson. *Invited talk to Symantec Research Labs. September 25th, 2012.*

Academic Activities

- **Security and Communication Networks 2013,** Journal reviewer.

Publications

- **Touching from a Distance: Website Fingerprinting Attacks and Defenses.** Xiang Cai, Xincheng Zhang and Rob Johnson. *ACM Conference on Computer and Communications Security, Raleigh, NC, October 2012.*

- **Fixing Races For Good: Serializable File-System Access for UNIX.** Xiang Cai, Rucha Lale, Xincheng Zhang and Rob Johnson. Submitted to *Transactions on Storage 2012.*

- **Exploiting Unix File-System Races via Algorithmic Complexity Attacks.** Xiang Cai, Yuwei Gui, and Rob Johnson. *IEEE Symposium on Security and Privacy, Oakland, CA, May 2009.*