

Gary Wassermann

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Education

Ph.D. in Computer Science

University of California, Davis

Thesis: *Program Analysis for Engineering Secure Web Applications*

Advisor: Prof. Zhendong Su.

expected Summer 2008

B.S. in Computer Science

University of California, Davis

Graduated with High Honors.

June 2002

Research Interests

I seek to improve the security and reliability of software, using ideas from domains ranging from formal logic to system implementation details. My background is in Programming Languages, Software Engineering, and Security, and specifically I want to improve the state of web programming.

Research Experience

University of California, Davis

Davis, CA

Research Assistant for Professor Zhendong Su, Fall 2003 – Present.

- Addressed the most prominent errors in web applications, including SQL injection and cross-site scripting (XSS), by formally characterizing command injection attacks in terms of the integrity of parse trees. Designed both runtime and compile-time checks for SQL injection and XSS based on this characterization.
- Formulated a new class of decision problems addressing languages of constraints and provided a decision procedure for regular languages of linear arithmetic constraints.
- Contributed to behavior-based analysis of time-dependant malware. The project leverages synergistically ideas from architecture-level monitoring, information flow tracking, and advanced program analysis techniques.
- Designed and established the soundness of a type system for an XML query language where the type system includes universal occurrence constraints.

DoCoMo USA Labs

Palo Alto, CA

Research Intern for Dachuan Yu, Summer 2007.

- Proposed and implemented an algorithm for automatically testing web applications. The algorithm handles string values and commonly used dynamic language features, both important in web application scripting languages, more precisely and gracefully than previous techniques.

Jet Propulsion Labs

Pasadena, CA

Research Intern for Nicolas Rouquette, Summer 2005.

- Proposed and experimented with a categorical technique to modularize engineering design and make it amenable to formal reasoning.

Publications

Refereed Conference Papers

ISSTA'08 Gary Wassermann, Dachuan Yu, Ajay Chander, Dinakar Dhurjati, Hiroshi Inamura, and Zhendong Su, “Dynamic Test Input Generation for Web Applications,” International Symposium on Software Testing and Analysis, 2008 (**26%**).

- ICSE'08** **Gary Wassermann** and Zhendong Su, “Static Detection of Cross-Site Scripting Vulnerabilities,” International Conference on Software Engineering, 2008 (**15%**).
- NOMS'08** Daniella A. S. de Oliveria, Jedidiah R. Crandall, **Gary Wassermann**, Shaozhi Ye, S. Felix Wu, Zhendong Su, and Frederic T. Chong, “Bezoar: Automated Virtual Machine-based Full-System Recovery from Control-Flow Hijacking Attacks,” IEEE/IFIP Network Operations and Management Symposium, 2008 (**27%**).
- PLDI'07** **Gary Wassermann** and Zhendong Su, “Sound and Precise Analysis of Web Applications for Injection Vulnerabilities,” ACM SIGPLAN Conference on Programming Language Design and Implementation, 2007 (**25%**).
- FSTTCS'06** **Gary Wassermann** and Zhendong Su, “Validity Checking for Finite Automata over Linear Arithmetic,” 26th Conference on Foundations of Software Technology and Theoretical Computer Science, 2006 (**22%**).
- ASPLOS'06** Jedidiah Crandall, **Gary Wassermann**, Daniela de Oliveira, Zhendong Su, S. Felix Wu, and Frederic T. Chong, “Temporal Search: Detecting Hidden Malware Timebombs with Virtual Machines,” 12th International Conference on Architectural Support for Programming Languages and Operating Systems, 2006 (**22%**).
- POPL'06** Zhendong Su and **Gary Wassermann**, “The Essence of Command Injection Attacks in Web Applications,” 33rd Annual Symposium on Principles of Programming Languages, 2006 (**19%**).

Journal Papers

- TOSEM** **Gary Wassermann**, Carl Gould, Zhendong Su, Premkumar Devanbu, “Static Checking of Dynamically Generated Queries in Database Applications,” ACM Transactions on Software Engineering and Methodology, 2007.

Workshop Papers

- ASID'06** Daniela de Oliveira, Jedidiah Crandall, **Gary Wassermann**, Zhendong Su, S. Felix Wu, and Frederic T. Chong, “ExecRecorder: VM-Based Full-System Replay for Attack Analysis and System Recovery,” Workshop on Architectural and System Support for Improving Software Dependability, 2006.
- SAVCBS'04** **Gary Wassermann** and Zhendong Su, “An Analysis Framework for Security in Web Applications,” Specification And Verification of Component-Based Systems, 2004 (**43%**).

Technical Reports

- Zhendong Su and **Gary Wassermann**, “A Type-Based Dimensional Analysis for XQuery,” UCD Dept. of Computer Science Technical Report, (CSE-2004-8) 2004.

Teaching Experience

Associate Instructor: *ECS 140A*
UC Davis

Department of Computer Science
Apr. 2008 – June 2008

I will teach 140A (Programming Languages), a large, required, upper division, core course introducing the fundamentals of modern programming languages and showing various languages' strengths. I will lecture, design the assignments, write the exams, and supervise the teaching assistants.

Teaching Assistant: *ECS 153, 160, 30*
UC Davis

Department of Computer Science
Sep. 2002 – July 2003

153 (Computer Security), 160 (Software Engineering), 30 (Programming and Problem Solving): Led discussion sections, guest lectured, graded homework, held office hours, and led review sessions.

Honors and Awards

GAANN Fellowship
Regents Scholarship

Graduated with High Honors
Robert C. Byrd Honors Scholarship

Professional Services

- **Reviewer:** APLAS, FSE, HOSC, ICSE, NDSS, PLDI, POPL, SAS, TACAS, TSE, WWW.
- **Faculty Recruiting Committee:** Student Representative (2005).
- **Program Chair:** UCD Student Workshop on Computing (2004).

References

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Additional references available upon request.