William Harris

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Research Interests

I am interested in programming languages, program analysis, and their application to problems in the domain of software correctness and security. Presently, I am investigating applying program analysis to automatically enforce information flow security in software systems.

Education

2007 – present
Ph. D. in Computer Sciences (minor in Mathematics)
University of Wisconsin, Madison, WI, USA.
Advisors: Somesh Jha and Thomas Reps
3.81 / 4.00 GPA

2003 – 2007
B. S. (Honors, with Distinction) in Computer Science and Mathematics, May 2007.
Purdue University, West Lafayette, IN, USA.
3.87 / 4.00 GPA

Research Experience

2007 – present
Research Assistant
University of Wisconsin, Madison, WI, USA.
Focus on applying program analysis techniques to problems in the domain of system security. At present I am developing a technique that automatically rewrites programs to enforce high level information flow properties.

2009
Summer Research Assistant
Microsoft Research India, Bangalore, India.
Developed a novel termination prover designed to prove termination for whole programs and scale to large, real-world programs.

2008
Summer Research Assistant
NEC Laboratories America, Princeton, NJ, USA.
Developed a program analysis scheme for efficiently performing symbolic, wholly path sensitive analysis.

2005 – 2007
Research Assistant
Purdue University, West Lafayette, IN, USA.
Designed and implemented support for pattern matching in the Java programming language and designed a domain-specific language for controlling a large, electronic sculpture.

Research Experience (continued)

2006 — *Summer Research Assistant*
Texas A&M University, College Station, TX, USA.
Focused on the development of techniques for automatically detecting parallelization using speculative execution.

Publications

William R. Harris, Sriram Sankaranarayanan, Franjo Invancic, and Aarti Gupta. *Program Analysis via Satisfiability Modulo Path Programs.* To appear in *Principles of Programming Languages 2010.*

William R. Harris, Nicholas A. Kidd, Sagar Chaki, Somesh Jha, and Thomas W. Reps. *Verifying Information Flow Control Over Unbounded Processes.* To appear in *Formal Methods 2009.*

Teaching Experience

2007 – 2008 — Project Mentor for "Introduction to Information Security."
Graduate and senior-undergraduate level course. Instructor: Somesh Jha. (University of Wisconsin, Madison, CS 642)

2004 – 2007 — Lab Teaching Assistant for "Introduction to Java."
Freshman-undergraduate level course. Instructor: H. E. Dunsmore. (Purdue University, CS 180)

2005 — Lab Teaching Assistant for "Ordinary Differential Equations."
Sophomore-undergraduate level course. Instructor: Johnny Brown. (Purdue University, MA 366)

Industrial Employment

2009 — *Summer Research Assistant*, Microsoft Research India, Bangalore, India.
Developed a novel, scalable method for proving termination of whole programs.

2007 — *Summer Research Assistant*, NEC Laboratories America, Princeton, NJ, USA.
Developed a novel symbolic method for path sensitive analysis of safety properties of programs.

2007 — *Software Engineering Intern*, Google Inc., Mountain View, CA, USA.
Extended an application testing framework to collect hardware profiling information and analyze performance for correlations between events.

2005 — *IT Department Intern*, Caterpillar Inc., West Lafayette, IN, USA.
Designed and implemented an application for monitoring server performance. Supported engineering applications.

Awards and Honorary Organizations

2009 *National Science Foundation Graduate Research Fellowship Program: Honorable Mention*

2007 *Glen E. Baxter Award*

2007 *Phi Beta Kappa: Member*

2006 *Upsilon Pi Epsilon: Member*

2006 *Purdue University Dept. of Computer Science Scholarship*

2003 *National Merit Scholar*

Community

2009 *External Reviewer: Static Analysis Symposium 2009*

2008 *External Reviewer: Computer Communications Review*

2008 *External Reviewer: IEEE Symposium on Security and Privacy*

2008 *IEEE: Student Member*

2008 *UW-Madison Dept. of Computer Sciences Graduate Admissions Committee Member*

2007 *ACM: Student Member*