

William R. Harris

CONTACT INFORMATION

School of Computer Science
Georgia Institute of Technology
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RESEARCH INTERESTS

Program verification and synthesis, software security

EDUCATION

University of Wisconsin-Madison, Madison, WI, USA

Ph.D. in Computer Science 2014

- Advisors: Somesh Jha and Thomas Reps
- Thesis topic: *Secure Programming via Game-based Synthesis*

M.S. in Computer Science 2011

Purdue University, West Lafayette, IN, USA

B.S. in Computer Science and Mathematics (Honors, with Distinction) 2007

REFEREED CONFERENCE PUBLICATIONS

Ren Ding, Chenxiong Qian, Chengyu Song, William R. Harris, Taesoo Kim, and Wenke Lee. *Efficient Protection of Path-Sensitive Control Security*. To appear in the proceedings of the *USENIX Security Symposium 2017*.

Hyouk Jun Kwon, William R. Harris, and Hadi Esmaeilzadeh. *Proving Flow Security via Automatically Synthesized Relational Invariants*. To appear in the proceedings of *Computer Security Foundations (CSF) 2017*.

Akhilesh Srikanth, Burak Şahin, and William R. Harris. *Complexity Verification Using Guided Theorem Enumeration*. *Principles of Programming Languages (POPL) 2017*.

Chengyu Song, Byoungyoung Lee, Kangjie Lu, William R. Harris, Taesoo Kim, and Wenke Lee. *Enforcing Kernel Security Invariants with Data Flow Integrity*. *Network and Distributed System Security Symposium (NDSS) 2016*.

Jongse Park, Hadi Esmaeilzadeh, Xin Zhang, Mayur Naik, and William R. Harris. *FLEXJAVA: Language Support for Safe and Practical Approximate Programming*. *Joint Meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software (ESEC/FSE) 2015*.

William R. Harris, Guoliang Jin, Shan Lu, and Somesh Jha. *Validating Library Usage Interactively*. *Computer Aided Verification (CAV) 2013*.

William R. Harris, Somesh Jha, Thomas Reps, Jonathan Anderson, and Robert N. M. Watson. *Declarative, Temporal, and Practical Programming with Capabilities*. *IEEE Symposium on Security and Privacy (Oakland) 2013*.

Florian Stagstetter, Martin Lukasiewicz, Sebastian Steinhorst Marko Wolf, Alexandre Bouard, William R. Harris, Somesh Jha, Thomas Peyrin, Axel Poschmann, and Samarjit Chakraborty. *Security Challenges in Automotive Hardware/Software Architecture Design*. *Design, Automation & Test in Europe (DATE) 2013* (Invited).

William R. Harris, Somesh Jha, and Thomas Reps. *Secure Programming via Visibly Pushdown Safety Games*. *Computer Aided Verification (CAV) 2012*.

William R. Harris and Sumit Gulwani. *Spreadsheet Table Transformations from Examples*. *Programming Language Design and Implementation (PLDI) 2011* (Recognized in a CACM Research Highlight).

William R. Harris, Somesh Jha, and Thomas W. Reps. *DIFC Programs by Automatic Instrumentation*. *Computer and Communications Security (CCS) 2010*.

William R. Harris, Akash Lal, Aditya V. Nori, and Sriram K. Rajamani. *Alternation for Termination*. *Static Analysis Symposium (SAS) 2010*.

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

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

JOURNAL PUBLICATIONS Sumit Gulwani, William R. Harris, and Rishabh Singh. *Spreadsheet Data Manipulation Using Examples*. *Communications of the ACM (CACM) 55(8)* (Research Highlight paper).

TUTORIALS *Synthesis for Security* 2016
HotSpot 2016, Eindhoven, NL

Secure Programs via Game-based Synthesis 2013
Formal Methods in Computer-Aided Design (FMCAD), Portland, OR, USA

OUTSIDE COLLOQUIA *Self-reliant Field Programmable Gate Arrays* 2016
Mentor Graphics Inc., Wilsonville, OR, USA

Self-reliant Field Programmable Gate Arrays 2015
Semiconductor Research Corporation, Durham, NC, USA

Secure Programming via Visibly Pushdown Safety Games 2012
Google Inc., Madison, WI, USA

Policy Weaving for Secure Systems 2011
MIT Programming Languages Working Group, MIT, Boston, MA, USA

RESEARCH GRANTS Defense Advanced Research Projects Agency (DARPA), *Extreme DDoS Defense (XD3)*, applied for 2,843,031 USD (pending negotiation; co-PI, with Taesoo Kim PI and Wenke Lee co-PI) 2016 - 2019.

National Science Foundation Secure and Trustworthy Cyberspace (SaTC), *STARSS: Small: Self-reliant Field-programming Gate Arrays*, 355,722 USD (PI, with Hadi Esmaeilzadeh co-PI) 2015 - 2017.

RESEARCH EXPERIENCE **Georgia Institute of Technology**, Atlanta, GA, USA 2015 – Present
Verification and system security
Assistant Professor

Georgia Institute of Technology, Atlanta, GA, USA 2014

Verification and system security
Instructor

University of Wisconsin-Madison, Madison, WI, USA 2007 – 2014
Secure programming and game-based synthesis
Research Assistant: Advised by Somesh Jha and Thomas Reps

Microsoft Research, Redmond, WA, USA 2010
End-user programming by example
Research Intern: Mentored by Sumit Gulwani

Microsoft Research India, Bangalore, Karnataka, India 2009
Termination analysis of programs
Research Intern: Mentored by Aditya Nori and Sriram Rajamani

NEC Labs America, Princeton, NJ, USA 2008
Safety analysis of programs
Research Intern: Mentored by Sriram Sankaranarayanan, Franjo Ivančić,
and Aarti Gupta

Google Inc., Mountain View, CA, USA 2007
Hardware profiling and application-performance analysis
Software Engineering Intern: Mentored by Silvius Rus

TEACHING
EXPERIENCE

Instructor for *Programming Languages* 2016
(Georgia Institute of Technology, CS 4392)
Undergraduate-level course.

Instructor for *Compilers and Interpreters* 2016
(Georgia Institute of Technology, CS 4240)
Undergraduate-level course.

Instructor for *Programming Languages* 2015
(Georgia Institute of Technology, CS 6390)
Graduate-level course.

Instructor for *Special Topics in Software Security* 2015
(Georgia Institute of Technology, CS 8803)
Graduate-level course.

Guest Lecturer for *Introduction to Programming Languages and Compilers* 2012
(University of Wisconsin-Madison, CS 536)
Senior-undergraduate-level course. Instructor: Somesh Jha

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

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

Lab Teaching Assistant for *Ordinary Differential Equations* 2005
(Purdue University, MA 366)

Sophomore-undergraduate level course. Instructor: Johnny E. Brown

HONORS AND
AWARDS

CACM Research Highlight invitation (joint with Sumit Gulwani and Rishabh Singh)	2012
Microsoft Research Graduate Fellowship Award	2010 – 2011
NSF Graduate Research Fellowship Program: Honorable Mention	2009
Glen E. Baxter Award	2007
Phi Beta Kappa	2007
Upsilon Pi Epsilon: Computer Science Honor Society	2006
David and Janice Fairchild Memorial for Nathaniel A. Johnson Scholarship	2006
National Merit Scholar	2003

PROFESSIONAL
ACTIVITIES

Program Committee: IEEE Secure Development Conference	2017
Program Committee: Asian Symposium on Programming Languages and Systems (APLAS)	2017
Program Committee: Computer Security Foundations (CSF)	2017
Program Committee: Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE)	2016
Program Committee: IEEE International Conference on Cloud Computing Technology and Science	2015, 2016
External Review Committee: Programming Language Design and Implementation (PLDI)	2016
Program Committee: Computer and Communications Security (CCS)	2015
Program Committee: Workshop on Foundations of Computer Security (FCS)	2015
Program Committee: Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE)	2015
Program Committee: ACM Conference on Data and Applications Security (CODASPY)	2015
Program Committee: Symposium on Access Control Models and Technologies (SACMAT)	2014
Program Committee: Verification, Model-checking, and Abstract Interpretation (VMCAI)	2015
Program Committee: Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE)	2015
Program Committee: Workshop on Foundations of Computer Security (FCS)	2015
External Reviewer: Computer Aided Verification (CAV)	2012, 2013, 2014
External Reviewer: Computer and Communications Security (CCS)	2010, 2011

External Reviewer: Computer Security Foundations (CSF)	2014
External Reviewer: Conference on Principles of Security and Trust (POST)	2015
External Reviewer: IEEE Symposium on Security and Privacy (“Oakland”)	2008, 2010
External Reviewer: International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	2015
External Reviewer: International Symposium on Software Testing and Analysis (ISSTA)	2014
External Reviewer: Principles of Programming Languages (POPL)	2011
External Reviewer: Symposium on Access Control Models and Technologies (SACMAT)	2015
External Reviewer: USENIX Security Symposium	2010

UNIVERSITY
SERVICE

PhD Visit Weekend Coordinator, School of Computer Science, Georgia Institute of Technology	2015 – present
Member of School Advisory Council, School of Computer Science, Georgia Institute of Technology	2015 – present
Member of Recruiting Effectiveness Committee, School of Computer Science, Georgia Institute of Technology	2016
Member of Faculty Recruiting Committee, School of Computer Science, Georgia Institute of Technology	2015