

WILLIAM HARRISON
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Professional Preparation:

June 1986	B.A., Mathematics, University of California, Berkeley, CA.
June 1992	M.S., Computer Science, University of California, Davis, CA.
May 2001	Ph.D., Computer Science, University of Illinois, Urbana, IL. Dissertation: “Modular Compilers and Their Correctness Proofs.” Committee Chairman: Samuel Kamin

Appointments:

Sept. 2003–present	Assistant Professor , Department of Computer Science, University of Missouri at Columbia, Columbia, Missouri.
June 2000–August 2003	Senior Research Associate & Adjunct Professor , Computer Science Department, OGI School of Science & Engineering, Oregon Health & Sciences University.
Sept. 2000–Dec. 2000	Senior Compiler Engineer (consultant) , Reservoir Laboratories, Portland, Oregon.
August 1999–May 2000	Visiting Lecturer , Department of Computer Science, Indiana University, Bloomington, IN 47401.
Spring 1999	Visiting Lecturer , Department of Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL.

Research Interests: High assurance software; Formal methods (particularly with respect to software and compiler verification); Computer security and language-based methods in security; Programming language design. Domain-specific languages with applications in biology.

Journal Publications:

- William Harrison and Richard Kieburtz. The Logic of Demand in Haskell. *Journal of Functional Programming*, 15(6), pages 837-891, 2005.
- William Harrison and James Hook. Achieving Information Flow Security Through Monadic Control of Effects. Invited submission to *Journal of Computer Security* (accepted for publication), 44 pages.
- X. Z. Fu, H. Wang, W. Harrison and R. Harrison. RNA Pseudoknot Prediction Using Term Rewriting. Invited submission to *International Journal of Data Mining and Bioinformatics*, (accepted for publication). 35 pages.

Refereed Conference & Workshop Publications:

- William Harrison. Proof Abstraction for Imperative Languages. *Proceedings of the 4th Asian Symposium on Programming Languages and Systems (APLAS06)*, pages 97-113, Sydney, Australia, November 2006.
- William Harrison. The Essence of Multitasking. *Proceedings of the 11th International Conference on Algebraic Methodology and Software Technology (AMAST06)*, LNCS vol. 4019, pages 158-172.
- William Harrison. A Simple Semantics for Polymorphic Recursion. *Proceedings of the 3rd Asian Symposium on Programming Languages and Systems (APLAS05)*, pages 37-51, Tsukuba, Japan, November 3-5, 2005.
- X. Z. Fu, H. Wang, W. Harrison and R. Harrison. RNA Pseudoknot Prediction Using Term Rewriting. *Proceedings of IEEE Fifth Symposium on Bioinformatics and Bioengineering (BIBE05)*, pages 169-176, Minneapolis, MN, October, 2005.
- William Harrison and James Hook. Achieving Information Flow Security Through Precise Control of Effects. *Proceedings of the 18th IEEE Computer Security Foundations Workshop 2005 (CSFW05)*, pages 16-30, Aix-en-Provence, France, July 20-22, 2005.

Refereed Conference & Workshop Publications (continued):

- William Harrison and Robert Harrison. Domain Specific Languages for Cellular Interactions. *Proceedings of the 26th Annual IEEE International Conference on Engineering in Medicine and Biology (EMBS04)*, pages 3019-22, San Francisco, California, USA. September 1-5, 2004.
- William Harrison, Mark Tullsen, and James Hook. Domain Separation by Construction. *LICS03 Satellite Workshop on Foundations of Computer Security (FCS03)*, 21 pages, Ottawa, Canada. June 26-27, 2003.
- William Harrison and Richard Kieburtz. Pattern-driven Reduction in Haskell. *Second International Workshop on Reduction Strategies in Rewriting and Programming*, 13 pages, Copenhagen, Denmark. July 21, 2002.
- William Harrison, Timothy Sheard, and James Hook. Fine Control of Demand in Haskell. *Proceedings of the Sixth International Conference on the Mathematics of Program Construction (MPC02)*, pages 68-93, Dagstuhl, Germany. July 8-10, 2002.
- William Harrison and Tim Sheard. Dynamically Adaptable Software with Metacomputations in a Staged Language. *Proceedings of the Second Workshop on the Semantics, Applications and Implementation of Program Generation (SAIG01)*, pages 163-182, Florence, Italy. September, 2001.
- William Harrison and Samuel Kamin. Metacomputation-based Compiler Architecture. *Proceedings of the Fifth International Conference on the Mathematics of Program Construction (MPC00)*, pages 213-229, Ponte de Lima, Portugal. July 4-7, 2000.
- William Harrison and Samuel Kamin. Modular Compilers Based on Monad Transformers. *Proceedings of the IEEE International Conference on Computer Languages (ICCL98)*, pages 122-32, Chicago, Illinois. May 14-16, 1998.
- William Harrison, Karl Levitt, and Myla Archer. A HOL Mechanization of the Axiomatic Semantics of a Simple Distributed Programming Language. *Proceedings of the International Workshop on Higher-Order Logic Theorem Proving and Its Applications*, pages 347-358, Leuven, Belgium. September 21-24, 1992.
- William Harrison and Karl Levitt. Mechanizing Security in HOL. *Proceedings of the International Workshop on Higher-Order Logic Theorem Proving and Its Applications*, pages 63-66, Davis, California. August 28-30, 1991.

Submitted for Publication:

- William Harrison. Cheap (But Functional) Threads. Submitted to *Journal of Functional Programming*, December 2004. 44 pages.

Technical Reports:

- William Harrison, Karl Levitt, and Myla Archer. Towards a Verified Code Basis for a Secure Distributed Operating System. *University of California at Davis Technical Report CSE-92-19*, October 1992.
- William Harrison. Mechanizing the Axiomatic Semantics for a Programming Language with Asynchronous Send and Receive in HOL. Master's Thesis. *University of California at Davis Technical Report CSE-92-20*, September 1992.

References:

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References (continued):

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Invited Talks:

- *Domain-specific Languages for Cellular Interactions*, University of Kansas, 4/29/05, Sponsor: Professor Perry Alexander.
- *Information-flow Security & Monadic Effects*, University of Illinois at Urbana-Champaign, 4/18/2005, Sponsor: Professor José Meseguer.
- *Domain-specific Languages for Biology*, Georgia State University, 5/26/2004, Sponsor: Professor Yi Pan.
- *Prospects for Modular Compilation*, Rice University, 12/11/2002, Sponsor: Professor Walid Taha.
- *Domain-specific Languages for Compilation*, University of Alabama, 11/22/2002, Sponsor: Professor Joel Jones.

Honors, Memberships, and Service:

- Recipient, National Science Foundation CAREER award (CyberTrust program) in 2008.
- Member of ACM and IEEE.
- Invited participant to the NSF High-Confidence Software Platforms for Cyber-Physical Systems (HCSP-CPS) Workshop, November 30-December 1, 2006 in Alexandria, Virginia.
- Summer Faculty Fellow to the 2006 Office of Naval Research/ASEE Summer Faculty Research Program. Research performed in the Software Engineering Section of the Naval Research Laboratory's Center for High Assurance Computer Systems in Washington, DC.
- Member of the program committee for the *7th International Conference on the Mathematics of Program Construction* (MPC2006).
- Received *Big Twelve Faculty Fellowship*, Internal University of Missouri, Columbia; visited University of Kansas System Level Design (SLDG) and Hybrid Threads groups.
- Reviewer for the Journal of Functional Programming (JFP), the Journal of Computer Security (JCS), the ACM Transactions on Programming Languages and Systems (TOPLAS), the ACM Journal of Experimental Algorithmics (JEA), and the American Medical Informatics Association Symposium 2005 (AMIA 2005).
- University of Missouri nominee for 2005 *Microsoft New Faculty Fellowship* for Bioinformatics research.

Pending Grant Support:

- *Enabling Multithreaded Programming Model Driven Synthesis of Custom SMP*, National Science Foundation *Foundations of Computing Processes and Artifacts (CPA)* program, \$122,349.55 over three years (my part). Submitted with Dr. David Andrews (KU).
- *Generating Secure Systems from Security Models*, National Science Foundation CyberTrust Program, \$233,737.52 over three years.
- *Enabling Hw/Sw Dynamic Reconfiguration: Modeling Hierarchies and Run Time Systems*, National Science Foundation *Computer Systems Research (CSR)* program, \$235,233 over three years (my part). Submitted with Dr. David Andrews (KU).
- *Feature-oriented Software Design*, National Science Foundation *Science of Design (SoD)* program, \$311,396 over three years (my part). Submitted with Dr. Perry Alexander (KU).