Adam Procter, Ph.D.

CONTACT INFORMATION

Department of Computer Science
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RESEARCH INTERESTS

Functional programming, semantics of programming languages, hardware synthesis from functional languages, hardware and software verification (especially for security), language-based security, model-driven implementation techniques for secure systems, computer-assisted theorem proving.

EDUCATION

University of Missouri, Columbia, Missouri USA

Ph.D., Computer Science, December 2014

- Dissertation: *Semantics-Driven Design and Implementation of High-Assurance Hardware*
- Advisor: William L. Harrison

B.A., Computer Science, May 2005

- Minor in Mathematics
- Graduated *summa cum laude*

CONFERENCE PUBLICATIONS

Ian Graves, Adam Procter, Wililam L. Harrison, Michela Becchi, and Gerard Allwein. Provably Correct Development of Reconfigurable Hardware Designs via Equational Reasoning. *Proceedings of the 2015 International Conference on Field-Programmable Technology (ICFPT'15)*, Queenstown, New Zealand, December 2015.

Adam Procter, William L. Harrison, Ian Graves, Michela Becchi, and Gerard Allwein. Semantics Driven Hardware Design, Implementation, and Verification with ReWire. *Proceedings of the 2015 ACM SIGPLAN/SIGBED Conference on Languages, Compilers, Tools and Theories for Embedded Systems (LCTES'15)*, Portland, June 2015.

Ian Graves, Adam Procter, William L. Harrison, Michela Becchi, and Gerard Allwein. Hardware Synthesis from Functional Embedded Domain-Specific Languages: A Case Study in Regular Expression Compilation. *Proceedings of the 11th International Symposium on Applied Reconfigurable Computing (ARC'15)*, Bochum, April 2015.

Adam Procter, William L. Harrison, Ian Graves, Michela Becchi, and Gerard Allwein. Semantics-directed Machine Architecture in ReWire. *Proceedings of the 2013 International Conference on Field-Programmable Technology (ICFPT'13)*, Kyoto, December 2013.

William L. Harrison, Adam Procter, and Gerard Allwein. The Confinement Problem in the Presence of Faults. *Proceedings of the 14th International Conference on Formal Engineering Methods (ICFEM'12)*, Kyoto, November 2012.

Chris Hathhorn, Michela Becchi, William L. Harrison and Adam Procter. Formal semantics of heterogeneous CUDA-C: A modular approach with applications. *Proceedings of the 2012 Systems Software Verification Conference (SSV'12)*, Sydney, November 2012.

Adam Procter, William L. Harrison, and Aaron Stump. The Design of a Practical Theorem Prover for a Lazy Functional Language. *Proceedings of the 2012 Symposium on Trends in Functional Programming (TFP'12)*, St Andrews, UK, June 2012.

Michela Becchi, Kittisak Sajjapongse, Ian Graves, Adam Procter, Vignesh Ravi, and Srimat Chakradhar. A Virtual Memory Based Runtime to Support Multitenancy in Clusters with GPUs. *Proceedings of the 21st International Symposium on High-Performance Parallel and Distributed Computing (HPDC'12)*, Delft, June 2012. **(Best paper award!)**

William L. Harrison, Benjamin Schulz, Adam Procter, Andrew Lukefahr, and Gerard Allwein. Towards Semantics-directed System Design and Synthesis. Invited paper. *Proceedings of the 2011 International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA'11)*, Las Vegas, July 2011.

William L. Harrison, Adam M. Procter, Jason Agron, Garrin Kimmell, and Gerard Allwein. Model-driven Engineering from Modular Monadic Semantics: Implementation Techniques Targeting Hardware and Software. *Proceedings of the IFIP Working Conference on Domain Specific Languages (DSLWC)*, Oxford, July 2009.

Pericles S. Kariotis, Adam M. Procter, and William L. Harrison. Making Monads First-class with Template Haskell. *Proceedings of the ACM SIGPLAN 2008 Haskell Symposium (Haskell '08)*, Victoria, BC, Canada, September 2008.

William L. Harrison, Gerard Allwein, Andy Gill, and Adam Procter. Asynchronous Exceptions as an Effect. *Proceedings of the Ninth International Conference on Mathematics of Program Construction (MPC'08)*, Marseille, July 2008.

Journal Publications

William L. Harrison and Adam M. Procter. Cheap (But Functional) Threads. Submitted to *Journal of Functional Programming*, draft available by request.

Professional Service

- External reviewer for IFL'11.
- Helped organize Midwest Verification Day 2014 in Columbia, MO.

Teaching Experience

Department of Computer Science, University of Missouri

- Instructor, Principles of Programming Languages, Fall 2010 and Fall 2012
- Teaching Assistant, Principles of Programming Languages, Fall 2009, Spring 2008, and Spring 2007
- Teaching Assistant, Production Languages (Programming in C), Fall 2007 and Fall 2006
- Instructor, Production Languages (Programming in C), Spring 2007
- Instructor, Algorithm Design and Programming I, Spring 2006
- Teaching Assistant, Algorithm Design and Programming I, Fall 2005

Japanese Studies Program, University of Missouri

- Instructor, Elementary Japanese II, Spring 2005
- Teaching Assistant, Elementary Japanese I, Fall 2004

The Learning Center, University of Missouri

- Tutor, Summer 2002—Spring 2004

Employment

Center for High Assurance Computing, University of Missouri

Postdoctoral Fellow November 2014—

- Postdoctoral researcher at the Center for High Assurance Computing.
- Supervisor: Professor William L. Harrison.

Department of Computer Science, University of Missouri

Graduate Research Assistant June 2008—December 2010

- Research assistant at the High Assurance Security Kernel (HASK) Lab, under Professor William L. Harrison.

Graduate Teaching Assistant August 2005—May 2008
August 2009—December 2009
August 2010—December 2010

- Served as instructor or teaching assistant for several diferent computer science courses.
- Duties ranged from grading and holding office hours to teaching a large lecture course and supervising four teaching assistants.

Department of Computer Science, University of Iowa

Short-Term Scientific Employee (Summer Visitor) June 2010—August 2010

- Developed a theorem-proving system for monadic programs in collaboration with Professor Aaron Stump.

Division of Biological Sciences, University of Missouri

Computer Programmer June 2006—May 2009

- Developed a LabVIEW-based application to play back aural stimuli to insects in support of behavioral and neurological experiments.

Japanese Studies Program, University of Missouri

Peer Learning Assistant August 2004—May 2005

- Served as co-instructor for Elementary Japanese II in Spring 2005.
- Conducted two weekly lab sessions for Elementary Japanese I in Fall 2004.

The Learning Center, University of Missouri

Tutor June 2002—May 2004

- Tutored individual students in computer science and elementary Japanese.
- Held group tutoring sessions in computer science.

Honors and Awards

Fellowships and Scholarships

- Graduate Assistance in Areas of National Need (GAANN) Fellowship, 2011—2014
- Gilliom Graduate Fellowship in Cyber Security, 2007—2009
- State of Missouri Bright Flight Scholarship, 2000—2005

Honors

- Honorary student marshal, University of Missouri College of Arts and Science commencement ceremony, May 2005
- University of Missouri College of Arts and Science dean's list every semester, Fall 2000—Spring 2005
- Phi Beta Kappa (junior-year inductee, 2003)

Technical Skills

Programming Languages

- Haskell, ML, Coq, C, Java, Perl, UNIX shell scripting, Python, Ruby, PHP, JavaScript, Visual Basic, LabVIEW

Hardware Description Languages

- VHDL

Operating Systems
- UNIX/Linux, Microsoft Windows, Mac OS X

Other
- HTML, CSS, SQL, MySQL and Oracle databases, Linux system administration

Languages

English (native speaker)
Japanese (read, write, and speak at a high intermediate to advanced level)
German (once intermediate, now quite rusty)

References

Available upon request.