

# Daniel S. Upton, Ph.D.

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## Education

January 2008-August 2011

Ph.D., Computer Science

University of Virginia, Charlottesville, VA 22904

August 2005-January 2008

Master of Computer Science

University of Virginia, Charlottesville, VA 22904

August 2001-May 2005

Bachelor of Science, Computer Science

University of Richmond, Richmond, VA 23173

## Graduate Coursework

Computer Architecture, Multicore Architectures, Optimizing Compilers, Algorithms, Theory of Computation, Distributed Systems, Virtual Machines

## Undergraduate Coursework

Operating Systems, Database Systems, Computer Graphics, Software Engineering, Programming Languages, Parallel Programming

## Dissertation Research

Developing methods for efficiently profiling homogeneous and heterogeneous multicore systems, including low-overhead memory tracing, modeling temperature relationships in multiprogrammed workloads, and collecting full-system profiles in heterogeneous systems.

## Publications

Dan Upton. *Enabling Efficient Online Profiling of Homogeneous and Heterogeneous Multicore Systems*. Ph.D. thesis, August 2011.

Dan Upton and Kim Hazelwood. "Leveraging Binary Translation for Heterogeneous Profiling." In *Fourth Workshop on Architectural and Microarchitectural Support for Binary Translation (AMAS-BT)*, June 2011.

Dan Upton and Kim Hazelwood. "Evaluating Linear Regression for Temperature Modeling at the Core Level." In *Ninth Annual Workshop on Duplicating, Debunking, and Deconstructing (WDDD)*, June 2011.

Dan Upton and Kim Hazelwood. "Finding Cool Code: An Analysis of Source-Level Causes of Temperature Effects." Poster presented at *2011 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, April 2011.

Dan Upton and Kim Hazelwood. "Design of a Custom VEE Core in a Chip Multiprocessor." In *Eighth IEEE Symposium on Application-Specific Processors (SASP)*, June 2010.

Dan Upton, Kim Hazelwood, Robert Cohn, and Greg Lueck. "Improving Instrumentation Speed via Buffering." In *2009 Workshop on Binary Instrumentation and Applications (WBIA)*, December 2009.

Mojtaba Mehrara, Thomas Jablin, Dan Upton, David August, Kim Hazelwood, and Scott Mahlke. "Multicore Compilation Strategies and Challenges." In *IEEE Signal Processing Magazine*, November 2009.

Daniel Williams, Aprotim Sanyal, Dan Upton, Jason Mars, Sudeep Ghosh, and Kim Hazelwood. "A Cross-Layer Approach to Heterogeneity and Reliability." In *Seventh ACM-IEEE International Conference on Formal Methods and Models for Codesign (MEMOCODE)*, July 2009.

Jason Mars, Daniel Williams, Dan Upton, Sudeep Ghosh, and Kim Hazelwood. "A Reactive Unobtrusive Prefetcher for Multicore and Manycore Architectures." In *Workshop on Software and Hardware Challenges of Manycore Platforms (SHCMP)*, June 2008.

Dan Upton and Kim Hazelwood. "Heterogeneous Chip Multiprocessor Design for Virtual Machines." In *Second Workshop on Software Tools for Multicore Systems (STMCS)*, March 2007.

## **Projects**

Multicore Architecture, Fall 2006-Spring 2007: Implementation toward a heterogeneous multicore simulator, combining native execution with simulation using a dynamic run-time environment to issue code to the hardware simulator.

Virtual Machines, Spring 2006: Developed methods for detecting and subverting virtual execution environments at run time.

Distributed Systems, Spring 2006: Implementation toward a distributed software repository, including giving users a local source repository and automatically merging check-ins when a user rejoins the development network.

Undergrad research assistant, Summer 2004: Developed a method to secure distributed volunteer computations based on machine learning to automatically categorize results as likely to be correct or falsified.

## **Work Experience**

Software Development Engineer, Microsoft Corporation – September 2011-current  
Software engineer for resource control in failover clustering.

Research Intern, Intel Corporation – June 2009-November 2009

Developed and implemented methods for profiling embedded systems containing a CPU and GPU to improve profiling of heterogeneous systems.

Research Intern, Intel Corporation – June 2008-August 2008

Implemented fast buffering in Pin, an industrial-strength dynamic binary instrumentation system, to improve performance on multithreaded applications and multicore processors.

### **Skills**

Languages: C, C++, Java, Python, some x86 assembly and Scheme

Software: Pin, JikesRVM, SimpleScalar, LaTeX, Linux Kernel, Visual Studio

Operating Systems: Windows, Linux