

Kelly A. Shaw

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Interests:

Computer architecture especially chip multiprocessors, operating systems, data intensive workloads

Education:

Stanford University

Ph.D. in Computer Science with Distinction in Teaching, 2005
Dissertation: *Resource Management in Single-Chip Multiprocessors*
Advisor: William J. Dally

M.S. in Computer Science, conferred 2001

Duke University

B.S., Summa cum Laude, Computer Science/Economics, 1997

Professional Experience:

University of Richmond: Assistant Professor (August 2004-Present)

Stanford University: Research Assistant (1997-2004)

Ph.D. student in Department of Computer Science, Concurrent VLSI Architecture group

IBM T. J. Watson Research Center: Research Intern (Summer 1998)

Created rules for optimizing arbitrary information flow graphs in content-based, publish-subscribe messaging system

Duke University: Student Researcher (Summer 1997)

Re-wrote the CProf cache profiling system for use on machines running Solaris

CRA-W Distributed Mentor Project: Research Intern (Summer 1996)

Analyzed impact of different processor cache configurations on application performance

Teaching Experience:

- CMSC 105: Elementary Programming (CS0)
- CMSC 150: Introduction to Computing (CS1)
- CMSC 221: Data Structures (CS2)
- CMSC 301: Computer Organization
- CMSC 330: Theory of Computation
- CMSC 340: Honors Thesis
- CMSC 395: Advanced Computer Architecture
- CS 193i: Internet Technologies (Stanford University)

Undergraduate Research Supervised

- Ivan Jibaja: Senior Honors Thesis in Computer Science, “Redesigning Computer Architecture to Optimize Performance on Data Mining Applications.” Spring 2008 – Fall 2008
- Nolan Hughes: Examined cache-to-cache transfers in OLTP database workloads. Summer 2008
- Yuri Dogandjiev: Analyzed shared memory behavior of applications with multiple processes. Summer 2006 – Spring 2008
- Brittany Williams: Modeled communication between multiple processes in chip multiprocessors. Summer 2007
- Brian Salmons: Created software to remove distortion from atomic force microscopy images. Summer 2006. (Co-advised)
- Brittany Kwait: Examined recurring sequences of data accesses across multiple processes for database workloads. Summer 2006. (CRA-W Distributed Mentor Project participant from Fordham University)

Grants and Fellowships:

- National Science Foundation proposal number 0702689 (Foundations of Computing Processes and Artifacts program). “RUI: Managing Memory Demands of Data Intensive Workloads in Chip Multiprocessors.” May 2007 – April 2010, \$135,000.
- University of Richmond Arts and Sciences Faculty Research Summer Fellowship. Proposal Title: “Reducing Communication Demands and Latency in Multiprocessor Systems via Data Rearrangement.” June 2005 – August 2005, \$5,000.

Publications:

- Ivan Jibaja and Kelly A. Shaw. “Understanding the Applicability of CMP Performance Optimizations on Data Mining Applications,” to appear in the 2009 *IEEE International Symposium on Workload Characterization (IISWC)*.
- Kelly A. Shaw and Margaret Martonosi. “Pairing Software-Managed Caching with Decay Techniques to Balance Reliability and Static Power in Next-Generation Caches,” *University of Richmond Math and Computer Science Technical Report TR-09-01*, May 2009.
- Cosmin Pancratov, Jacob M. Kurzer, Kelly A. Shaw, and Matthew L. Trawick. “Why Computer Architecture Matters: Thinking Through Trade-offs in Your Code,” *IEEE Computing in Science and Engineering*. September/October 2008, vol. 10, no. 5.
- Cosmin Pancratov, Jacob M. Kurzer, Kelly A. Shaw, and Matthew L. Trawick. “Why Computer Architecture Matters: Memory Access,” *IEEE Computing in Science and Engineering*. July/August 2008, vol. 10, no. 4.
- Cosmin Pancratov, Jacob M. Kurzer, Kelly A. Shaw, and Matthew L. Trawick. “Why Computer Architecture Matters,” *IEEE Computing in Science and Engineering*. May/June 2008, vol. 10, no. 3.
- Kelly A. Shaw. “Understanding the Working Sets of Data Mining Applications,” *Eleventh Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-11)*. February 2008.

- Kelly A. Shaw. "Resource Management in Single-Chip Multiprocessors," Doctoral Dissertation. Stanford University. March 2005.
- Kelly A. Shaw and William J. Dally. "Migration in Single-Chip Multiprocessors," *IEEE Computer Architecture Letters*. Volume 1, November 2002.
- Guruduth Banavar, Marc Kaplan, Kelly Shaw, Rob Strom, Daniel Sturman, and Wei Tao. "Information Flow Based Event Distribution Middleware," *Proceedings of the Nineteenth IEEE International Conference on Distributed Computing Systems (ICDCS) Workshops*. May 1999, pp. 114–121.
- Margaret Martonosi and Kelly Shaw. "Interactions between Application Write Performance and Compilation Techniques: A Preliminary View," *IEEE Technical Committee on Computer Architecture (TCCA) Newsletter*. June 1997.
- Margaret Martonosi and Kelly Shaw. "Interactions between Application Write Performance and Compilation Techniques: A Preliminary View," *High Performance Computer Architecture (HPCA) Workshop on Interactions between Compilers and Computer Architectures*. February 1997.

Invited Talks:

Princeton Electrical Engineering Department Seminar. "Passing Information Across the Hardware/Software Boundary in Multi-core Chips." Princeton University. April 2, 2007.

Talks:

Kelly A. Shaw. "Understanding the Working Sets of Data Mining Applications," *Eleventh Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-11)*. Salt Lake City, UT. February 17, 2008.

Honors:

- Distinction in Teaching, Stanford School of Engineering (2005)
- Gabilan Stanford Graduate Fellowship (1997-2000)
- National Science Foundation Graduate Research Fellowship (1997-2000)
- Computing Research Association Outstanding Undergraduate Honorable Mention (1997)

Professional Service:

- Program Committee Member, *International Conference for High Performance Computing, Networking, Storage, and Analysis (SC)*, 2009
- Program Committee Member, *Grace Hopper Celebration of Women in Computing*, 2007
- Organizing Committee Member and Panel Moderator, CRA-W/CDC Computer Architecture Summer School, 2006
- Vendor Co-Chair: *Consortium for Computing Sciences in Colleges Eastern Conference*, 2006
- Advisory Board Member: Owen Astrachan's NSF CISE Distinguished Education Fellow grant, 2007-present
- Judge: ACM Student poster competition at *Grace Hopper Celebration of Women in Computing*, 2006
- Reviewer: NSF panels, 2007, 2008, and 2009

- Reviewer: *Design Automation Conference (DAC)*, 2007 and 2008
- Reviewer: *Grace Hopper Celebration of Women in Computing* scholarship applications, 2007
- Reviewer: *IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, 2006
- Reviewer: *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, 2006
- Reviewer: *IEEE Computer Architecture Letters (CAL)*, 2006
- Reviewer: *Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2005
- Reviewer: *International Conference on Computer Design (ICCD)*, 2005
- Reviewer: Elsevier journal *Performance Evaluation*, 2005
- Reviewer: *ACM Transactions on Architecture and Code Optimization (TACO)*, 2005
- Reviewer: *ACM Transactions on Computer Systems (TOCS)*, 2005
- Member: Association for Computing Machinery (ACM), ACM SIGARCH (Special Interest Group on Computer Architecture), ACM SIGCSE (Special Interest Group on Computer Science Education)

University Service:

- Library Liaison: Department of Mathematics and Computer Science (2005- present)
- Academic Advisor: Undeclared student (2005 – present) and majors (2005 – present)
- Department Representative: Classroom Master Plan (2005)
- Committee Member: Clare Boothe Luce Scholarship (2007 - present)