

Research Interests

Runtime program analysis/optimization, automatic resource characterization, adaptive compilation, parallel and multi-core languages/compilers

Education

Rice University

Houston, TX

Ph.D. student in Computer Science, 3.85 GPA

August 2004 to present

Advisor: Dr. Keith D. Cooper

- Ph.D. Thesis: **Foundations for Automatic Adaptable Compilation**, *Expected 2011*
- M.S. Thesis: **Tuning an Adaptive Compilation Search Space with Loop Unrolling**, *April 2007*
- Compiler Development Experience: LLVM, Open64, ILOC
- Research-Related Courses: Advanced Compiler Construction, Advanced Parallel Compilation, Artificial Intelligence, Programming Languages, Parallel Computing, Multi-core Computing
- Technical Communication: CAIN Project Presentation Coach, *Fall 2006 to Fall 2007*

Michigan Technological University

Houghton, MI

B.S. in Computer Science, Minor in Music, 3.97 GPA

August 2000 to May 2004

- Research: Concurrent Mentor, an educational distributed computing tool, *Fall 2003*
- Research-Related Courses: Compiler Construction, Advanced Computer Architecture

Publications and Presentations

Papers

- **Dynamic compilation for component-based high-performance computing**. K. D. Cooper and J. A. Sandoval. In Workshop on Component-Based High Performance Computing (CBHPC), Portland, Oregon, November 2009.
- **Tuning an adaptive compiler**. K. D. Cooper, T. J. Harvey, and J. A. Sandoval. In First Workshop on Statistical and Machine learning approaches applied to ARchitectures and compilaTion (SMART'07), Ghent, Belgium, January 2007.

Posters

- **Detecting processor instruction cache for platform aware compilation**. J. A. Sandoval, K. D. Cooper, and T. J. Harvey. ASPLOS Poster Session, March 2010.
- **Adaptive compilation insights into compiler implementation**. J. A. Sandoval and K. D. Cooper. LACSI Symposium Poster Session, October 2006. *Poster Presentation Honorable Mention*.
- **Adaptive compilation insights into compiler implementation**. J. A. Sandoval and K. D. Cooper. PLDI Poster Session, June 2006.
- **Improving adaptive compilation with truncated execution and loop unrolling**. J. A. Sandoval, K. D. Cooper, and T. J. Harvey. LACSI Symposium Poster Session, October 2005.

Lectures/Presentations

- **Automatic analysis for memory hierarchy characterization**. J. A. Sandoval. AACE PI Meeting Presentation, June 2010.
- **Characterizing data cache linesize and associativity**. J. A. Sandoval. COMP612 Lecture, Rice University, April 2010.
- **Characterizing instruction cache**. J. A. Sandoval. AACE PI Meeting Presentation, January 2010.
- **Dynamic compilation for CCA applications**. J. A. Sandoval, K. D. Cooper, and J. Mellor-Crummey. Spring CCA Forum Meeting Presentation, April 2009.
- **Dynamic compilation**. J. A. Sandoval. COMP512 Lecture, Rice University, April 2009.

Work Experience

Qualcomm, Inc.

Austin, TX

QCT DSP Core Design Compiler Team – Intern

May 2007 to August 2007

- Contributed to development of a highly optimizing compiler for Qualcomm's next generation DSP
- Designed a training module, "Optimizing C Code," for use within a tools training program
- Presented training module to over 100 internal developers

IBM Corporation

Rochester, MN

eServer Systems Management Software Co-Op

May 2003 to August 2003

- Participated in design and implementation of systems management prototype product
- Tested and debugged code for OS/400, Windows, and Linux (PowerPC and Intel)
- Developed in Java, C, CL, and qshell
- Interacted daily with OS/400 and iSeries Navigator

IBM Corporation

Rochester, MN

Hard Disk Drive Microcode Tools Co-Op

January 2002 to August 2002

- Provided software tools and support for HDD firmware developers and testers
- Developed HDD error logging utility for internal IBM use as well as external customer use
- Implemented object oriented HDD device driver in C++ for Windows and Linux

Leadership and Teamwork

Clubs and Organizations:

- Executive Committee Member, Rice Graduate Christian Fellowship, *2006 to 2007*
- Vice President of MTU Rowing Club, *Fall 2000 to Spring 2003*
- Secretary of MTU Society of Hispanic Professional Engineers; *Fall 2000 to Spring 2002*

Boy Scouts: Troop 798, Blessed Sacrament, Midland, MI

- Achieved rank of Eagle Scout; *November 1998*
- Served as an adult Assistant Scoutmaster; *August 1999 to August 2000*

Music:

- Participated in Rice University Jazz Band, *August 2005 to May 2007*
- Participated in Michigan Tech Jazz Band and Jaztec jazz combo; *August 2000 to May 2004*