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Education

University of Maryland, College Park, Maryland USA

Ph.D. Computer Science, expected graduation date: December 2010

M.S. Computer Science, May 2008 • Advisor: Jeffrey K. Hollingsworth

Grinnell College, Grinnell, Iowa USA

B.A., computer science (with honors), May 2004 B.A., economics (with honors), May 2004 (Phi Beta Kappa, Full Scholarship: 2000-2004)

Research Experience University of Maryland College Park, Maryland USA

Research Assistant under Prof. Jeffrey K. Hollingsworth

2006-present

My research is primarily in the area of automatic performance analysis and tuning of scientific applications. My project, parallel Active Harmony, takes a search-based collaborative approach to auto-tuning. Application programmers and end-users collaborate to describe and export a set of performance related tunable parameters to the Harmony system. These parameters define a tuning search-space. The auto-tuner monitors the program performance and suggests application adaptation decisions. The decisions are made by a central controller using a parallel search algorithm.

More recently, I have been working on making online tuning practical. For tunable parameters that require new code (for example, unroll factors), the Harmony system generates code on-the-fly. Effectively, this merges traditional feedback directed optimization and just-in-time compilation.

My other research interests include software engineering and peer-to-peer networks.

Grinnell College Grinnell, Iowa USA

Research Assistant under Prof. Charles Jepsen

Summer 2003

Analyzed and implemented different algorithms to find odd order of different polyominoes.

Grinnell College Grinnell, Iowa USA

Research Assistant under Prof. Samuel Rebelsky

Summer 2001 and 2002

Developed a suite of tools that allows faculty to explore the ways in which students use online course materials.

Publications

Book Chapters:

End-to-end Auto-tuning with Active Harmony Ananta Tiwari, and Jeffrey K. Hollingsworth In Preparation

Journals:

Tuning Parallel Applications in Parallel Ananta Tiwari, Vahid Tabatabaee, and Jeffrey K. Hollingsworth In Parallel Computing, Volume 35, Issue 8-9 (August 2009).

PERI Auto-Tuning

David Bailey, Jacqueline Chame, Chun Chen, Jack Dongarra, Mary Hall, Jeffrey K. Hollingsworth, Paul Hovland, Shirely Moore, Keith Seymour, Jaewook Shin, **Ananta Tiwari**, Sam Williams, and Haihang You

In Journal of Physics: Conference Series 125, (November 2008).

Conferences:

Online Adaptive Code Generation and Tuning **Ananta Tiwari**, and Jeffrey K. Hollingsworth In Submission

A Scalable Autotuning Framework for Compiler Optimization

Ananta Tiwari, Chun Chen, Jacqueline Chame, Mary Hall, and Jeffrey K. Hollingsworth In proceedings of the *IEEE International Parallel & Distributed Processing Symposium (IPDPS09)*, Rome Italy, May 2009.

Parallel Parameter Tuning for Applications with Performance Variability Vahid Tabatabaee, **Ananta Tiwari**, and Jeffrey K. Hollingsworth In proceedings of the *IEEE/ACM Supercomputing 2005 (SC'05)*, Seattle WA, November 2005.

Clio's Assistants: A Tool Suite for Exploring Student Web Usage Greg Fuller, Joe Simonson, **Ananta Tiwari**, and Samuel A. Rebelsky In proceedings of the *World Conference on Educational Multimedia*, *Hypermedia*, & *Telecommunications* (EdMedia'02), Denver, CO, June 2002.

Invited Talks

- Online Adaptive Code Generation and Tuning Paradyn/Condor Week 2010, Madison, WI. April 2010.
- A Scalable Autotuning Framework for Compiler Optimization Paradyn/Dyninst Week 2009, College Park, MD. April 2009.
- Active Harmony: Automatic Performance Tuning

 Maryland Software Day, University of Maryland, College Park. June 2008.
- Exploring Code Transformation Space with Active Harmony *Paradyn/Condor Week 2008*, Madison, WI. April 2008.
- Standardized Search Space Representation for Empirical Optimization

 Automatic Tuning of Libraries and Applications Workshop (High Performance Computer Science Week), Denver, CO. March 2008.

Research Demos

- Exploring Code Transformation Space (for SMG2000) using Active Harmony At *IEEE/ACM Supercomputing 2009 (SC'09)*, Portland OR, November 2009.
- Automatic Tuning for Application-level Input Parameters using Active Harmony At IEEE/ACM Supercomputing 2007 (SC'07), Reno NV, November 2007.
- Dynamic Adaptability in Scientific Applications
 Paradyn/Condor Week 2007, Madison, WI. April 2007. & Paradyn/Dyninst Week 2006, College Park, MD. April 2006.

Teaching Experience University of Maryland, College Park, Maryland USA

Teaching Assistant: CMSC132 Object Oriented Programming Fall 2004, Summer 2006 Responsibilities included leading discussion sessions, holding office hours and grading. CMSC132 is an introductory course (in Java) that includes students from a wide range of backgrounds and interests.

Grinnell College, Grinnell, Iowa USA

Teaching Assistant: CS151, CS152 and CS341

2001-2004

Responsibilities included leading lab sessions, holding tutoring hours and grading. CS151 and CS152 are introductory courses (in scheme and Java respectively). CS341 is an advanced topic course in theory of computation.

Software Experience

Java, C, C++, Scheme/Lisp, Fortran, Perl, Python, Linux, Unix, Windows, MPI, OpenMP, Tcl/Tk, Lex, Yacc, ANTLR

Awards, Honors, and Services

- Referee for PPOPP 2010 conference.
- Active member of Social Action Volunteers (SAV-Nepal) an organization that helps orphan children in Nepal.
- Mortar Board Senior Honor Society, Grinnell College, 2004.
- Recipient of Linn Smith Prize for Excellence in Mathematics, Grinnell College, 2004.
- Grinnell College Dean's list: Spring 2001, Fall 2001, Spring 2002, Fall 2002, Spring 2003
- Recipient of Joseph F. Wall Outstanding Junior Award Grinnell College, 2003.
- Ranked first in all-Nepal class 11 and class 12 examination (1998 and 1999).

References

Jeffrey K. Hollingsworth Dept. of Computer Science University of Maryland Email: hollings@cs.umd.edu

Robert F. Lucas Information Sciences Institute (ISI) University of Southern California Email: rflucas@isi.edu Mary Hall

School of Computing University of Utah Email: mhall@cs.utah.edu

Alan Sussman

Dept. of Computer Science University of Maryland Email: als@cs.umd.edu