Ananta Tiwari

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Contact Information

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Education

University of Maryland, College Park, Maryland USA

Ph.D. Computer Science, January 2011
- Advisor: Jeffrey K. Hollingsworth

M.S. Computer Science, May 2008

Grinnell College, Grinnell, Iowa USA

B.A., Computer Science (with honors), May 2004
B.A., Economics (with honors), May 2004

Research Experience

Programmer/Analyst IV, PMaC Lab, San Diego Supercomputer Center
Supervised by Dr. Laura Carrington   **March 2011 - present**

Participating on research to bring scientific rigor to the prediction and understanding of factors affecting the performance of current and projected HPC platforms.

University of Maryland College Park, Maryland USA
Research Assistant under Prof. Jeffrey K. Hollingsworth   **January 2006 - January 2011**

My dissertation research was 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.

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
Jeffrey K. Hollingsworth, and **Ananta Tiwari**
In *Performance Tuning of Scientific Applications*, David H. Bailey, Robert F. Lucas, and Samuel W. Williams, ed., 2010.

Journals:
Auto-tuning Full Applications: A Case Study
Ananta Tiwari, Jeffrey K. Hollingsworth, Chun Chen, Mary Hall, Chunhua Liao, Daniel J. Quinlan
To Appear in *Parallel Processing*.

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).

PERI Autotuning of PFLOTRAN
Jacqueline Chame, Chun Chen, Mary Hall, Jeffrey K. Hollingsworth, Kumar Mahinthakumar, Gabriel Marin, Shreyas Ramalingam, Sarat Sreepathi, Vamsi Sripathi, **Ananta Tiwari**
In *Journal of Physics, Proceedings of SciDAC 2011*, (July 2011).

Conferences and Workshops:
Modeling Power and Energy Usage of HPC Kernels
Ananta Tiwari, Michael Laurenzano, Laura Carrington, and Allan Snavely
To appear in *The Eighth Workshop on High-Performance, Power-Aware Computing (HPPAC'12)*, Shanghai China, May 2012

Auto-tuning for Energy Usage in Scientific Applications
Ananta Tiwari, Michael Laurenzano, Laura Carrington, and Allan Snavely
In proceedings of *The Fifth Workshop Productivity and Performance (PROPER'11)*, Bordeaux France, August 2011

Online Adaptive Code Generation and Tuning
Ananta Tiwari, and Jeffrey K. Hollingsworth
In proceedings of the *IEEE International Parallel & Distributed Processing Symposium (IPDPS'11)*, Anchorage Alaska, May 2011.
Best Paper - Software track

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 (IPDPS'09)*, 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 |

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 (HPCSW08) Denver, CO. 2008.

Grants	Co-PI for UCSD on Institute for Sustained Performance, Energy, and Resilience (SUPER) DoE SciDAC-3 and is involved in the energy efficiency thrust for the institute FY11-FY16 ($1075K).

Teaching Experience *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 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. CS341 is an advanced topic course in theory of computation.

Professional Activities
- Referee for PPoPP (Principles and Practice of Parallel Computing) 2010
- Program Committee member for ESCAPE (Workshop on Extreme Scale Computing Application Enablement) 2011