Christopher Stewart

Curriculum Vitae, February 2009

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Research Interests

I am interested in complex large-scale software systems, such as Internet services. The goals of my research are to understand the principal factors affecting their performance and to use that knowledge to improve their design and implementation.

Education

Ph.D. in Computer Science, University of Rochester 2008
Thesis title: Performance Modeling and System Management for Internet Services
Advisor: Dr. Kai Shen

M.S. in Computer Science, University of Rochester 2005

B.S. in Computer Science, Morehouse College 2003

Vitae Highlights

- Developed performance prediction software for Internet services that is scheduled for technology transfer at Hewlett Packard.
- Published in competitive, peer-reviewed forums like NSDI, EuroSys, ASPLOS, and USENIX.
- Invited to the program committee of HotDep 2009.
- Co-advised two undergraduate research projects.
- Organized graduate-student recruitment seminars at Morehouse College and Spelman College to increase diversity in computer science research.

Professional Internships

Hewlett-Packard Labs, Palo Alto, CA 2006—2008

Worked with Terence Kelly, Alex Zhang, Fereydoon Safai, and Rich Friedrich.

Developed software that predicts an Internet service's throughput and response time. The software is scheduled to be included in a capacity planning tool used by HP consultants.

Created a workload generator that issues synthetic requests to a web server in a realistic fashion. This program is now used by other HP researchers to conduct experiments.

Sun Microsystems, Menlo Park, CA 2005

Worked with Mick Jordan and Grzegorz Czajkowski.

Created a framework that allows utility computing centers to deploy complex applications at component-level granularity .

New Birth Missionary Baptist Church, Atlanta, GA 2002—2003

Developed an enterprise-quality database system for the human resources department.

Accenture, Atlanta, GA 2002

Developed an Oracle database application to manage Bell South's financial reports.

Publications

Conference Proceedings

Kai Shen, Christopher Stewart, Chuanpeng Li, and Xin Li. "Reference-Driven Performance Anomaly Identification." *Accepted in the International Conference on Measurement and Modeling of Computer Systems (**SIGMETRICS**)*, June 2009 (Acceptance rate: 15%).

Christopher Stewart, Matthew Leventi, and Kai Shen. "Empirical Examination of A Collaborative Web Application." *IEEE International Symposium on Workload Characterization (**IISWC**)*, September 2008 (Acceptance rate: 30%, software available at http://www.cs.rochester.edu/u/stewart/collaborative.html).

Terence Kelly, Kai Shen, Alex Zhang, and Christopher Stewart. "Operational Analysis of Parallel Servers." *Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (**MASCOTS**)*, September 2008 (Acceptance rate: 38%).

Christopher Stewart, Terence Kelly, Alex Zhang, and Kai Shen. "A Dollar From 15 Cents: Cross-Platform Management for Internet Services." *USENIX Annual Technical Conference (**USENIX**)*, June 2008 (Acceptance rate: 19%).

Kai Shen, Ming Zhong, Sandhya Dwarkadas, Chuanpeng Li, Christopher Stewart, and Xiao Zhang. "Hardware Counter Driven On-the-Fly Request Signatures." *Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**)*, March 2008 (Acceptance rate: 24%).

Christopher Stewart, Terence Kelly, and Alex Zhang. "Exploiting Nonstationarity for Performance Prediction." *European Conference on Computer Systems (**EuroSys**)*, March 2007 (Acceptance rate: 22%).

Peter Derosa, Kai Shen, Christopher Stewart, and Jonathon Pearson. "Realism and Simplicity: Disk Simulation for Instructional OS Performance Evaluation." *ACM SIGCSE Technical Symposium (**SIGCSE**)*, March 2006 (Acceptance rate: 35%).

Christopher Stewart and Kai Shen. "Performance Modeling and System Management for Multi-component Online Services." *Symposium on Networked Systems Design and Implementation (**NSDI**)*, May 2005 (Acceptance rate: 22.3%).

Invited Papers

Robbert van Renesse, Rodrigo Rodrigues, Mike Spreitzer, Christopher Stewart, Doug Terry, and Franco Travostino. "Challenges Facing Tomorrow's Datacenter: Summary of the LADiS Workshop." *Workshop on Large Scale Distributed Systems and Middleware (**LADIS**),* September 2008.

Workshops & Short Papers

Christopher Stewart and Kai Shen. "Configuration-Space Performance Anomaly Depiction." *Workshop on Large Scale Distributed Systems and Middleware (**LADIS**),* September 2008.

Kai Shen, Alex Zhang, Terence Kelly, and Christopher Stewart. "Operational Analysis of Processor Speed Scaling." Brief announcement in *Symposium on Parallelism in Algorithms and Architectures (**SPAA**)*, June 2008.

Zhikui Wang, Xue Liu, Alex Zhang, Christopher Stewart, Xiaoyun Zhu, and Terence Kelly. "AutoParam: Automated Control of Application-Level Performance in Virtualized Server Environments." *Feedback Control Implementation and Design in Computing Systems and Networks (**FeBID**)*, May 2007.

Christopher Stewart, Ming Zhong, Kai Shen, and Tom O'Neill. "Comprehensive Depiction of Configuration-Dependent Performance Anomalies in Distributed Server Systems." *Hot Topics in System Dependability (**HotDep**)*, December 2006.

Mick Jordan and Christopher Stewart. "Adaptive Middleware for Component-Level Deployment." *Workshop on Adaptive and Reflective Middleware (**ARM**)*, Novemeber 2005.

Christopher Stewart, Kai Shen, Sandhya Dwarkadas, Michael L. Scott, and Jian Yin. "Profile-driven Component Placement for Cluster-based Online Services." *IEEE Distributed Systems Online. Also a work-in-progess at the International Middleware Conference (**Middleware**)*, October 2004.

Posters & Abstracts

Christopher Stewart, Terence Kelly, and Alex Zhang. "Application-level Performance Prediction Across Multi-Core Processor Configurations." Poster at the USENIX Annual Technical Conference *(**USENIX**)*, June 2007.

Christopher Stewart and Kai Shen. "Daphne: Performance Debugging Using Model-driven Anomaly Characterization." *Poster at the ACM Symposium on Operating Systems Principles (**SOSP**)*, October 2005.

Under Submission

Christopher Stewart, Kai Shen, Arun Iyengar, and Jian Yin, *"EntomoModel: Understanding and Avoiding Performance-Bug Manifestations."*

Pending Patents

Terence Kelly, Christopher Stewart, and Alex Zhang. "Application Performance Analysis for a Multiple Processor Queuing Station." HP Docket Number 200704460, 2008.

Terence Kelly, Christopher Stewart, and Alex Zhang. "Predicting Performance Consequences of Migrating an Application from First Hardware to Second Hardware." HP Docket Number 200702883, 2007.

Zhikui Wang, Alex Zhang, Christopher Stewart, Xiaoyun Zhu, Terence Kelly, Sharad Singhal, Xue Liu. "Dynamically Resizing a Virtual Machine Container." HP Docket Number 200701779, 2007.

Terence Kelly, Christopher Stewart, and Alex Zhang. "Transaction Mix Performance Models For Performance Anomaly Detection." HP Docket Number 200505103, 2006.

Public Presentations

Dissertation

"Performance Modeling and System Management for Internet Services." University of Rochester, October 2008.

Invited Talks

"Reasons to Consider a Career in Research." *Morehouse College (also presented at Spelman College)*, November 2008.

"A Dollar From 15 Cents: Cross-Platform Management for Internet Services." *ETH Zurich*, June 2008.

"My Experiences in Grad. School." *Morehouse College*, March 2006.

Conferences & Workshops

"Empirical Examination of A Collaborative Web Application." *IEEE International Symposium on Workload Characterization*, September 2008.

"A Dollar From 15 Cents: Cross-Platform Management for Internet Services." *USENIX Annual Technical Conference*, June 2008.

"Operational Analysis of Processor Speed Scaling." *Symposium on Parallelism in Algorithms and Architectures*, June 2008.

"Exploiting Nonstationarity for Performance Prediction." *European Conference on Computer Systems*, March 2007.

"Comprehensive Depiction of Configuration-Dependent Performance Anomalies in Distributed Server Systems." *Hot Topics in System Dependability*, December 2006.

"Performance Modeling and System Management for Multi-component Online Services." *Symposium on Networked Systems Design and Implementation*, May 2005.

"Profile-driven Component Placement for Cluster-based Online Services." *International Middleware Conference*, October 2004.

Organizations and Service

Strong commitment to increasing diversity in computer science research

- Organized graduate-student recruitment seminars at Morehouse College and Spelman College for the University of Rochester. These seminars have led to strong faculty-level relationships between the schools.
- Redesigned the "Prospective Students" web page for the University of Rochester computer science department.

Active volunteer in the systems research community

- Program committee member for HotDep 2009.
- External reviewer for SOSP 2005, ISPASS 2006, OSDI 2006, HotDep 2006, Eurosys 2008, USENIX 2008, OSDI 2008, and the Journal of Systems and Software.
- Member of USENIX, ACM, and Computer Professionals for Social Responsibility (CPSR).

Undergraduate Mentoring

Matthew Leventi, University of Rochester, now at Microsoft — 2008
Honors project: WeBWorK: A New Benchmark for Collaborative Web Applications

Tom O'Neill, University of Rochester, now at Microsoft — 2006
Research project: Deploying and Configuring the Geronimo Application Server

Teaching Experience

Guest Lecturer, Advanced Operating Systems, University of Rochester — 2008

Guest Lecturer, Computer Networks, University of Rochester — 2007

Teaching Assistant, Operating Systems, University of Rochester — 2005

Teaching Assistant, Computation and Formal Systems, University of Rochester — 2004

Lab Instructor, Computer Programming I, Morehouse College — 2001—2002

References

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