

# Todd Gamblin

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## Education

- 2009 **Ph.D., Computer Science**, *University of North Carolina at Chapel Hill.*
- 2005 **M.S., Computer Science**, *University of North Carolina at Chapel Hill.*
- 2002 **B.A., Computer Science & Japanese**, *Williams College.*

## Awards

- 2006-2008 Latané Interdisciplinary Fellowship *see [humanscience.org/info/JGL.cfm](http://humanscience.org/info/JGL.cfm)*
- 2007 Member, Frank Porter Graham Honor Society (for service) *see [unc.edu/fpghs](http://unc.edu/fpghs)*
- 2006 Best Poster. Los Alamos Computer Science Institute (LACSI) Symposium.
- 2004 NSF East Asia and Pacific Summer Institutes (EAPSI) Fellowship.
- 2001 Linen Grant for Summer Travel in Asia (Williams College award for research abroad).  
*Funded to attend NE Asian/American International Student Conference in Sapporo, Japan.*

## Research Experience

- 2009-present **Postdoctoral Scholar**, *Lawrence Livermore National Laboratory.*  
Researching scalable performance tools for machines with millions of concurrent tasks as part of the Exascale Computing Technologies (ExaCT) project. Collaborating with Bronis de Supinski and Martin Schulz.
- 2008-2009 **Research Intern**, *Lawrence Livermore National Laboratory.*  
Jun, Aug 2007 Collaborated with Bronis de Supinski on scalable load-balance measurement and Ph.D. dissertation.
- 2004-2008 **Research Assistant**, *Renaissance Computing Institute (RENCI), UNC Chapel Hill.*  
Built load-balance tools using wavelet compression. Researched clustering performance data and adaptively sampled tracing. Worked towards Ph.D. on scalable performance monitoring, advised by Daniel A. Reed.
- Summer 2006 **Research Intern**, *IBM Thomas J. Watson Research Center.*  
Worked with Dr. Alan Bivens on distributed clock synchronization algorithms for virtualized environments. Modified an algorithm used in System z mainframes for use in Enterprise Workload Manager.
- Summer 2004 **Research Intern**, *Nanya-Nakamura Laboratory, University of Tokyo.*  
Under NSF EAPSI fellowship, investigated building low-power processors with asynchronous digital logic.
- 2003-2004 **Research Assistant**, *Clockless Computing, UNC Chapel Hill.*  
Investigated modular interfaces for asynchronous circuits under Dr. Montek Singh.
- 2001-2002 **Undergraduate Research Assistant**, *Williams College.*  
Senior project on cache conscious memory optimizations in the Java Virtual Machine. Worked with Dr. Duane A. Bailey.
- Summer 1999 **Summer Research Assistant**, *Physics Department, North Carolina State University.*  
Designed imaging algorithms and an archival website for the Diffraction Enhanced Imaging Group.

## Professional Experience

- 2002-2003 **Software Developer**, *ValueCommerce, Co., Ltd., Tokyo, Japan.*  
Developed enterprise control panel application for web-hosting system. Application enabled clients to set up web hosting and 3rd-party brokers to sell hosting to their own clients. Also conducted performance analysis and optimization for web advertisement servers.
- Summer 2001 **Summer Intern**, *EMC Corp., Research Triangle Park, NC..*  
Developed modular, web-based user interface for ip4700 Network Attached Storage Servers.

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Summer 2000 **Summer Intern, EMC Corp.**, Research Triangle Park, NC..  
Worked with a team to develop a distributed, cross-platform performance monitoring tool for large networks.  
Major client was Bloomberg, L.P.

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## Teaching

Spring 2006 **Instructor, UNC Chapel Hill.**  
Taught COMP 14: Introduction to Computer Programming.

Spring 2001 **Teaching Assistant, Williams College.**  
Spring 2000 Assisted students in lab for Computer Science 134: Introduction to Programming.

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## Professional Activities

Memberships IEEE, ACM.

Conferences IPDPS'09, ICS'09, PACT'09 (Reviewing); PACT'09 (Organizing Committee)

Journals Int. J. High Performance Computing (Reviewing)

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## University Activities

2005-2007 IT Coordinator, UNC Graduate and Professional Student Federation (GPSF)  
Conceived and implemented a campus-wide wiki to facilitate research collaborations and other projects at UNC. Built secure web applications for travel funding and committee appointments. *see [gpsf-wiki.unc.edu](http://gpsf-wiki.unc.edu)*

2006 Member, UNC IT Strategic Planning Committee *see [its.unc.edu/strategic](http://its.unc.edu/strategic)*

2005 GPSF Senator for UNC Computer Science Department

2001-2002 Senior Advisor to underclassmen, Williams College Computer Science Department



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## Skills

Performance Engineering Extensive experience with parallel performance tool development in C, C++. Measurement, analysis, and tuning of MPI applications on large clusters (IBM Blue Gene series, Cray XT series, Intel, AMD).  
Data analysis techniques: sampling, wavelet analysis, clustering.

Enterprise Web Development Extensive server-side Java experience: MVC architecture, Tomcat, Apache, Struts, Velocity.  
Java Data Objects (JDO), JDBC, SQL with Oracle. Ruby on Rails, Mongrel server.

Other Python, PyQt4, Ruby, Perl, CVS, Subversion, Autotools, some VTK.

Languages  English (fluent),  Japanese (conversational)

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## Publications

### — Papers —

- [1] Bronis R. de Supinski, Sadaf Alam, David H. Bailey, Laura Carrington, Chris Daley, Anshu Dubey, **Todd Gamblin**, Dan Gunter, Paul D. Hovland, Heike Jagode, Karen Karavanic, Gabriel Marin, John Mellor-Crummey, Shirley Moore, Boyana Norris, Leonid Oliker, Catherine Olschanowsky, Philip C. Roth, Martin Schulz, Sameer Shende, Allan Snavely, Wyatt Spear, Mustafa Tikir, Jeff Vetter, Pat Worley, and Nicholas Wright. *Modeling the office of science ten year facilities plan: The PERI architecture tiger team*. *Journal of Physics: Conference Series, SciDAC 2009*, 2009.
- [2] Robert J. Fowler, Laksono Adhianto, Bronis R. de Supinski, Mike Fagan, **Todd Gamblin**, Mark Krentel, John Mellor-Crummey, Martin Schulz, and Nathan Tallent. *Frontiers of performance analysis on leadership class systems*. *Journal of Physics: Conference Series, SciDAC 2009*, 2009.
- [3] **Todd Gamblin**, Bronis R. de Supinski, Martin Schulz, Robert J. Fowler, and Daniel A. Reed. *Scalable load-balance measurement for SPMD codes*. In *Supercomputing 2008 (SC'08)*, Austin, Texas, November 15-21 2008. (21.3% accepted).

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- [4] Robert J. Fowler, **Todd Gamblin**, Allan K. Porterfield, Patrick Dreher, Song Huang, and Balint Joo. Performance engineering challenges: The view from RENCI. *Journal of Physics: Conference Series, SciDAC 2008*, 125:5, August 2008.
- [5] Bronis R. de Supinski, Robert J. Fowler, **Todd Gamblin**, Frank Mueller, Martin Schulz, and Prasun Ratn. An open framework for scalable, reconfigurable analysis. In *International Workshop on Scalable Tools for High-End Computing (STHEC)*, Kos, Greece, June 7-12 2008.
- [6] **Todd Gamblin**, Robert J. Fowler, and Daniel A. Reed. Scalable methods for monitoring and detecting behavioral classes in scientific codes. In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, Miami, FL, April 14-18 2008. (25.6% accepted).
- [7] Francisco Chinchilla, **Todd Gamblin**, Morten Sommervoll, and Jan F. Prins. Parallel N-body simulation using GPUs. Technical Report TR04-032, University of North Carolina at Chapel Hill, December 2004.

— Posters & Presentations —

- [8] **Todd Gamblin**, Bronis R. de Supinski, Martin Schulz, Robert J. Fowler, and Daniel A. Reed. System-wide performance equivalence class detection using clustering. In *Supercomputing 2008 (SC'08)*, Austin, TX, November 15-21 2008.
- [9] Robert J. Fowler, **Todd Gamblin**, Allan K. Porterfield, Pat Dreher, Song Huang, and Balint Joó. Performance engineering challenges: the view from RENCI. In *Scientific Discovery through Advanced Computing (SciDAC) Program Conference*, Seattle, WA, July 13-17 2008.
- [10] **Todd Gamblin**, Bronis R. de Supinski, Martin Schulz, Robert J. Fowler, and Daniel A. Reed. Scalable load-balance measurement using wavelets. In *The Salishan Conference on High-Speed Computing*, Gleneden Beach, OR, April 21-24 2008.
- [11] **Todd Gamblin**. Scalable load-balance measurement and analysis. In *SIAM Conference on Parallel Processing for Scientific Computing (PP08)*, Atlanta, GA, March 12-14 2008.
- [12] **Todd Gamblin**, Prasun Ratn, Bronis R. de Supinski, Martin Schulz, Frank Mueller, Robert J. Fowler, and Daniel A. Reed. An open framework for scalable, reconfigurable performance analysis. In *Supercomputing 2007 (SC'07)*, Reno, NV, November 2007.
- Best Poster** [13] **Todd Gamblin**, Robert J. Fowler, and Daniel A. Reed. Methods for automatic behavioral stratification in scientific codes. In *Proceedings of the 7th LACSI Symposium*, Santa Fe, NM, October 17-19 2006.
- [14] **Todd Gamblin** and Daniel A. Reed. Adaptive performance monitoring and profiling in large-scale systems. In *Proceedings of the 6th LACSI Symposium*, Santa Fe, NM, October 11-13 2005.

— Book Chapters —

- [15] Robert J. Fowler, **Todd Gamblin**, Gopi Kandaswamy, Anirban Mandal, Allan K. Porterfield, Lavanya Ramakrishnan, and Daniel A. Reed. Challenges of scale: When all computing becomes grid computing. In Lucio Grandinetti, editor, *High Performance Computing and Grids in Action*, volume 16 of *Advances in Parallel Computing*, pages 186–206. IOS Press, Amsterdam, 2007.

— Ph.D. Dissertation —

- [16] **Todd Gamblin**. *Scalable Performance Measurement and Analysis*. PhD thesis, University of North Carolina at Chapel Hill, Chapel Hill, NC, August 2009.