

# Greg Bronevetsky

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## Research Interests

- Compiler Analyses for Parallel Applications
- Reliability Modeling
- Checkpointing Techniques
- Soft Error Detection and Tolerance

## Education

Ph.D. Computer Science, Cornell University, 2007  
M.S. Computer Science, Cornell University, 2003  
B.S. Computer Science (summa cum laude), The College of New Jersey, 1999

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## Professional Experience

2006–present	Lawrence Post-Doctoral Fellow, Center for Applied Scientific Computing, Lawrence Livermore National Laboratory (LLNL), Livermore, CA
2004	Research Intern, IBM Watson Research Center
2001	Research Intern, Palo Alto Research Center (PARC)
2000–2006	Research Assistant and Teaching Assistant, Cornell University
1999–2000	Computer Programmer, Charles Jones, LLC
1996–1999	Technical Software Engineer, Midi, inc.

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## Honors

- Lawrence Post-Doctoral Fellowship, Lawrence Livermore National Laboratory
  - NSF Graduate Fellowship
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## Publications

### Journal and Conference Papers

- 2009
  - Richard L. Graham, Richard Barrett, Greg Bronevetsky, Erez Haba, Gregory Koenig, Hideyuki Jitsumoto, Thomas Herauld, Joshua Hursey, Adam Moody, Kannan Narasimhan, Howard Pritchard and David Solt, "Towards Support for Fault Tolerance in the MPI Standard", Submitted to the ACM Conference on Computing Frontiers, May 2009.
  - Bronevetsky, G., de Supinski, B. and Schulz, M., "Soft Error Vulnerability of Numeric Libraries", IEEE Workshop on Silicon Errors in Logic - System Effects (SELSE), Mar 2009.
  - Bronevetsky, G., Marques, D., Pingali, K., Rugina, R. and McKee S.A., "Compiler-Enhanced Incremental Checkpointing for OpenMP Applications". IEEE International Parallel & Distributed Processing Symposium (IPDPS), May 2009.
  - Bronevetsky, G., Gyllenhaal, J. and de Supinski, B. "CLOMP: Accurately Characterizing OpenMP Application Overheads". International Journal of Parallel Programming (IJPP), 2009.
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", International Symposium on Code Generation and Optimization (CGO), Mar 2009.
- 2008
  - Schulz, M., Bronevetsky, G. and de Supinski, B., "On the Performance of Transparent MPI Piggyback Messages", EuroPVM/MPI Conference, Sep 2008.
  - Bronevetsky, G. and de Supinski, B., "Soft Error Vulnerability of Iterative Linear Algebra Methods". International Conference on Supercomputing (ICS), Jun 2008.
  - Bronevetsky, G., Gyllenhaal, J. and de Supinski, B. "CLOMP: Accurately Characterizing OpenMP Application Overheads". International Workshop on OpenMP (IWOMP), May 2008.
- 2007
  - Bronevetsky, G., Marques, D., Pingali, K. and Rugina, R. "Compiler-Enhanced Incremental Checkpointing". International Workshop on Languages and Compilers for Parallel Computing (LCPC), Oct 2007.

- Bronevetsky, G., de Supinski, B. "Soft Error Vulnerability of Iterative Linear Algebra Methods". Workshop on Silicon Errors in Logic – System Effects (SELSE), Apr 2007.
- Bronevetsky, G., de Supinski, B. "Complete Formal Specification of the OpenMP Memory Model". International Journal of Parallel Programming (IJPP), Vol 35, Num 4, pp. 335-392, 2007.
- 2006
  - Bronevetsky, G., Pingali, K., Stodghill, P. "Application-level Checkpointing for OpenMP Programs". International Conference on Supercomputing (ICS), Jun 2006.
  - Bronevetsky, G., de Supinski, B. "Formal Specification of the OpenMP Memory Model". International Workshop on OpenMP (IWOMP), Jun 2006.
  - Bronevetsky, G., Fernandes, R., Marques, D., Pingali, K. and Stodghill, P. "Recent Advances in Checkpoint/Recovery Systems", NSF Next Generation Systems Program Workshop, Apr 2006.
- 2005
  - Marques, D., Bronevetsky, G., Fernandes, R., Pingali, K., Stodghill, P. "Optimizing Checkpoint Sizes in the C<sup>3</sup> System". NSF Next Generation Software Program Workshop, Apr 2005.
- 2004
  - Schulz, M., Bronevetsky, G., Fernandes, R., Marques, D., Pingali, K., and Stodghill, P. "Implementation and Evaluation of a Scalable Application-level Checkpoint-Recovery Scheme for MPI Programs". IEEE/ACM Supercomputing Conference, Nov 2004.
  - Bronevetsky, G., Schulz, M., Szwed, P., Zaman S. and Pingali, K. "Checkpointing Shared Memory Programs at the Application-level". European Workshop on OpenMP (EWOMP), Oct 2004.
  - Bronevetsky, G., Schulz, M., Szwed, P., Zaman S. and Pingali, K. "Application-level Checkpointing for Shared Memory Programs". Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Oct 2004.
- 2003
  - Bronevetsky, G., Marques, D., Pingali, K., and Stodghill, P. "C<sup>3</sup>: A System for Automating Application-level Checkpointing of MPI Programs". In Proceedings of the 16th International Workshop on Languages and Compilers for Parallel Computing (LCPC), Oct 2003.
  - Bronevetsky, G., Marques, D., Pingali, K., and Stodghill, P. "Collective Operations in an Application-level Fault Tolerant MPI System". In Proceedings of the 2003 ACM International Conference on Supercomputing (ICS), Jul 2003.
  - Bronevetsky, G., Marques, D., Pingali, K., and Stodghill, P. "Automated Application-level Checkpointing of MPI Programs". In Proceedings of the 2003 ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), Jul 2003.
- 1999
  - Bronevetsky, G. "The Brains of WHAT: A Data Structure for Internet Searches". ACM Symposium on Computer Science Education (SIGCSE), Mar 1999.
  - Bronevetsky, G., et al. "A Data Structure and Filter Design for Assisting Users to Traverse Web Search Information". The Journal of Computing in Small Colleges (JCSC), Vol 13, Num 5, pp.214-216, 1998.
- 1998
  - Bronevetsky, G., et al. "Simplified Java Programming Through Graphical User Interfaces and File Utilities". The Journal of Computing in Small Colleges (JCSC), Vol 13, Num 5, pp.209-211, 1998.

**Dissertation:** Bronevetsky, G., "Portable Checkpointing for Parallel Applications", Ph.D. dissertation, Cornell University, 2007.

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## Invited Talks

- 2009
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", Stanford University Computer Science Department, Jan 2009.
  - Bronevetsky, G., "Accurate Prediction of Soft Error Vulnerability of Scientific Applications", Los Alamos National Laboratory, Jan 2009.
- 2008
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", Microsoft Research, Dec 2008.
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", University of Washington Computer Science Department, Dec 2008.
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", University of California San Diego Computer Science Department, Dec 2008.
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", Rochester University Computer Science Department, Nov 2008.
  - Bronevetsky, G., "Communication-Sensitive Static Dataflow for Parallel Message Passing Applications", Intel Corporation, Oct 2008.

- Bronevetsky, G., “Accurate Prediction of Soft Error Vulnerability of Scientific Applications”, Workshop on Performance Analysis of Extreme-Scale Systems and Applications at the Los Alamos Computer Science Symposium (LACSS), Oct 2008.
- Bronevetsky, G., “Accurate Prediction of Soft Error Vulnerability of Scientific Applications”, Workshop on Resiliency for Petascale HPC at the Los Alamos Computer Science Symposium (LACSS), Oct 2008.
- Bronevetsky, G., “Communication-Sensitive Static Dataflow for Parallel Message Passing Applications”, Workshop on Programming Models for Modern Architectures at the Los Alamos Computer Science Symposium (LACSS), Oct 2008.
- 2006
  - Bronevetsky, G. “Fault Tolerance Now!”, Stanford University Computer Science Department, Feb 2006.
  - Bronevetsky, G. “Fault Tolerance Now!”, University of Illinois Urbana Champaign Computer Science Department, Oct 2006.
  - Bronevetsky, G. “Blocking Checkpointing of Shared Memory Applications”, University of California Berkeley Computer Science Department, Feb 2006.

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## Funded Projects

- Abhishek Chandra, Zhi-Li Zhang, Greg Bronevetsky and Kevin Anderson, “A Holistic Approach to Fault Inference and Prediction in Distributed Systems” at \$44,000 by the The Digital Technology Center at University of Minnesota.

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## Service

- 2009
  - Program Committee - IEEE/ACM Supercomputing Conference, 2009.
  - Program Committee - IEEE International Conference on Networking, Architecture, and Storage (NAS), 2009.
  - Program Committee - International Conference on Parallel Architectures and Compilation Techniques (PACT), 2009.
- 2008
  - Chair - First Workshop on the Analysis of System Logs (WASL) at the Symposium on Operating Systems Design and Implementation (OSDI), 2008.
  - Program Committee - IEEE/ACM Supercomputing Conference, 2008.
  - Reviewer - EuroPar 2008.
  - Member - LLNL Institutional Postdoc Program Board, 2008
  - Member - LLNL Postdoctoral Association, 2008
  - Web Chair, Workshops Chair - ACM International Conference on Computing Frontiers, 2008.
  - Co-Chair - Workshop on Radiation Effects and Fault Tolerance in Nanometer Technologies 2008 at Computing Frontiers, 2008.
  - Program Committee - ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), 2008.
- 2007
  - Program Committee - Workshop on System-level Virtualization for High Performance Computing (HPCVirt), 2007.
  - Program Committee - IEEE/ACM Supercomputing Conference, 2007.
  - Program Committee - IEEE Conference on Mass Storage Systems and Technologies (MSST), 2007.

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## Mentored Students

- Jan 2009 – July 2009 : Ignacio Laguna, PhD student, Purdue University
- May 2007 – Aug 2007 : Catherine Trammell, PhD student, Cornell University
- May 2007 – Aug 2007 : Ruke Ufomata, undergraduate student, Cornell University

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## Teaching

- **Course Instructor, Cornell University**
  - Fall 2004 : CS717 Application-level Detection and Tolerance of Complex Faults
- **Teaching Assistant, Cornell University**
  - Spring 2004 : CS612 Compiler Design for High-Performance Architectures
  - Fall 2000 : CS211 Computers and Programming
  - Spring 2001 : CS130 Creating Web Documents
- **Teaching Assistant, The College of New Jersey**
  - Fall 1998: HONR 280 Creative Computing

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## Organizations

- Institute for Electrical and Electronics Engineers (IEEE) and IEEE Computer Society
- Association for Computing Machinery (ACM)
- Materials Research Society (MRS)