6 Publications and Products

6.1 Journals

- S. S. Mukherjee, S. V. Adve, T. Austin, J. Emer, and P. S. Magnusson. Performance Simulation Tools. *IEEE Computer*, 35(2):38–39, February 2002. Special issue on high performance simulators.

- C. J. Hughes, V. S. Pai, P. Ranganathan, and S. V. Adve. RSIM: Simulating shared-memory multiprocessors with ILP processors. *IEEE Computer*, 35(2):40–49, February 2002. Special issue on high performance simulators.

- X. Li, Z. Li, P. Zhou, Y. Zhou, S. V. Adve, and S. Kumar. Performance-directed energy management for storage systems. *IEEE Micro*, 24(6):38–49, November-December 2004. Special issue on the Top Picks from Computer Architecture Conferences from October 2003 to October 2004.

- Gengbin Zheng, Terry Wilmarth, Praveen Jagadishprasad, and Laxmikant V. Kalé. Simulation-based performance prediction for large parallel machines. In *International Journal of Parallel Programming*, volume 33, pages 183–207, 2005.

- Laxmikant V. Kalé, Gengbin Zheng, Chee Wai Lee, and Sameer Kumar. Scaling applications to massively parallel machines using projections performance analysis tool. In *Future Generation Computer Systems*, 22(3):347–358, February 2006.

- Gengbin Zheng, Chao Huang, and Laxmikant V. Kalé. Performance evaluation of automatic checkpoint-based fault tolerance for ampi and charm++. *ACM SIGOPS Operating Systems Review: Operating and Runtime Systems for High-end Computing Systems*, 40(2), April 2006.

- Orion Lawlor, Sayantan Chakravorty, Terry Wilmarth, Nilesh Choudhury, Isaac Dooley, Gengbin Zheng, and Laxmikant Kale. Parfum: A parallel framework for unstructured meshes for scalable dynamic physics applications. *Engineering with Computers*, 2006.

6.2 Books and Conferences

Conference Proceedings and Technical Reports:

- Neelam Saboo, Arun Kumar Singla, Joshua Mostkoff Unger, and L. V. Kalé. Emulating petaflops machines and blue gene. In *Workshop on Massively Parallel Processing (IPDPS'01)*, San Francisco, CA, April 2001.

- C. J. Hughes, J. Srinivasan, and S. V. Adve. Saving energy with architectural and frequency adaptations for multimedia applications. In *Proceedings of the 34^{th} International Symposium on Microarchitecture (MICRO-34)*, pages 250–261, December 2001.

- O. S. Lawlor and L. V. Kalé. A Voxel-Based Parallel Collision Detection Algorithm. In *Proceedings of the International Conference in Supercomputing*, pages 285–293, 2002.

- Gengbin Zheng, Arun Kumar Singla, Joshua Mostkoff Unger, and Laxmikant V. Kalé. A parallel-object programming model for petaflops machines and blue gene/cyclops. In *NSF Next Generation Systems Program Workshop, 16th International Parallel and Distributed Processing Symposium(IPDPS)*, Fort Lauderdale, FL, April 2002.

- Ruchira Sasanka, Christopher J. Hughes, and Sarita V. Adve. Joint local and global hardware adaptations for energy. In *Proceedings of the 10^{th} International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS-X)*, October 2002.

- James C. Phillips, Gengbin Zheng, Sameer Kumar, and Laxmikant V. Kalé. NAMD: Biomolecular simulation on thousands of processors. In *Proceedings of Supercomputing'02*, Baltimore, November 2002.

- R. Jain, C. J. Hughes, and S. V. Adve. Soft real-time scheduling on a simultaneous multithreaded processor. In *Proceedings of the 23^{rd} IEEE International Real-Time Systems Symposium (RTSS-2002)*, December 2002.

- Jayanth Srinivasan and Sarita V. Adve. Predictive dynamic thermal management for multimedia applications. In *Proceedings of the 17^{th} Annual ACM International Conference on Supercomputing (ICS'03)*, pages 109–120, June 2003.

- Gengbin Zheng, Gunavardhan Kakulapati, and Laxmikant V. Kalé. Bigsim: A parallel simulator for performance prediction of extremely large parallel machines. In *18th International Parallel and Distributed Processing Symposium (IPDPS)*, Santa Fe, New Mexico, April 2004.

- Gengbin Zheng, Terry Wilmarth, Orion Sky Lawlor, Laxmikant V. Kalé, Sarita Adve, David Padua, and Philippe Geubelle. Performance modeling and programming environments for petaflops computers and the blue gene machine. In *NSF Next Generation Systems Program Workshop, 18th International Parallel and Distributed Processing Symposium(IPDPS)*, Santa Fe, New Mexico, April 2004. IEEE Press.

- Christopher J. Hughes and Sarita V. Adve. A formal approach to frequent energy adaptations for multimedia applications. In *Proceedings of the* 31^{st} *International Symposium on Computer Architecture (ISCA'04)*, June 2004.

- R. Sasanka, S. V. Adve, Y. K. Chen, and E. Debes. The energy efficiency of CMP vs. SMT for multimedia workloads. In *Proceedings of the* 18^{th} *Annual ACM International Conference on Supercomputing (ICS'04)*, June 2004.

- Terry Wilmarth and L. V. Kalé. Pose: Getting over grainsize in parallel discrete event simulation. In *2004 International Conference on Parallel Processing*, pages 12–19, August 2004.

- Gengbin Zheng, Lixia Shi, and Laxmikant V. Kalé. Ftc-charm++: An in-memory checkpoint-based fault tolerant runtime for charm++ and mpi. In *2004 IEEE International Conference on Cluster Computing*, San Dieago, CA, September 2004.

- Xiaodong Li, Zhengmin Li, Francis Davis, Pin Zhou, Yuanyuan Zhou, Sarita Adve, and Sanjeev Kumar. Performance-directed energy management for main memory and disks. In *Proceedings of the* 12^{th} *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'04)*, October 2004.

- Terry L. Wilmarth, Gengbin Zheng, Eric J. Bohm, Yogesh Mehta, Nilesh Choudhury, Praveen Jagadishprasad, and Laxmikant V. Kale. Performance prediction using simulation of large-scale interconnection networks in pose. In *Proceedings of the Workshop on Principles of Advanced and Distributed Simulation*, pages 109–118, 2005.

- Nilesh Choudhury, Yogesh Mehta, Terry L. Wilmarth, Eric J. Bohm, and Laxmikant V. Kalé. Scaling an optimistic parallel simulation of large-scale

interconnection networks. In *Proceedings of the Winter Simulation Conference*, 2005.

- Orion Lawlor, Hari Govind, Isaac Dooley, Michael Breitenfeld, and Laxmikant Kalé. Performance degradation in the presence of subnormal floating-point values. In *Proceedings of the OSIHPA Workshop at PACT05*, September 2005.

- Laxmikant V. Kalé, Klaus Schulten, Robert D. Skeel, Glenn Martyna, Mark Tuckerman, James C. Phillips, Sameer Kumar, and Gengbin Zheng. Biomolecular modeling using parallel supercomputers. In *Handbook of computational molecular biology*, pages 34.1–34.43, 2005.

- Gengbin Zheng, Orion Sky Lawlor, and Laxmikant V. Kalé. Multiple flows of control in migratable parallel programs. In *Proceedings of the 8th Workshop on High Performance Scientific and Engineering Computing (HPSEC-06)*, Columbus, Ohio, August 2006.

- Gengbin Zheng, Michael S. Breitenfeld, Hari Govind, Philippe Geubelle, Laxmikant V. Kalé. Automatic dynamic load balancing for a crack propagation application. Technical report, Parallel Programming Laboratory, Department of Computer Science, University of Illinois, 2006.

- Sandhya Mangala, Terry Wilmarth, Sayantan Chakravorty, Nilesh Choudhury, Laxmikant V. Kalé, and Philippe H. Geubelle. Parallel Adaptive Simulations of Dynamic Fracture Events. In preparation.

- Isaac Dooley, Sandhya Mangala, Laxmikant Kalé and Philippe Geubelle. Parallel simulations of dynamic fracture using extrinsic cohesive elements. In preparation.

Theses:

- Ruchira Sasanka. Combining Intra-Frame with Inter-Frame Hardware Adaptations to Save Energy. Master's thesis, University of Illinois at Urbana-Champaign, 2002.

- Gunavardhan Kakulapati. Simulating large parallel machines for performance prediction. Master's thesis, University of Illinois at Urbana-Champaign, 2003.

- Praveen Kumar Jagadishprasad. Parallel simulation of large scale interconnection networks used in high performance computing. Master's thesis, University of Illinois at Urbana-Champaign, 2004.

- Vikas Mehta. Leanmd: A charm++ framework for high performance molecular dynamics simulation on large parallel machines. Master's thesis, University of Illinois at Urbana-Champaign, 2004.

- Yogesh Mehta. Low diameter regular graph as a network topology in direct and hybrid interconnection networks. Master's thesis, Dept. of Computer Science, University of Illinois, 2005.

- Terry L. Wilmarth. *POSE: Scalable General-purpose Parallel Discrete Event Simulation*. PhD thesis, Department of Computer Science, University of Illinois at Urbana-Champaign, 2005.

- Gengbin Zheng. *Achieving High Performance on Extremely Large Parallel Machines: Performance Prediction and Load Balancing*. PhD thesis, Department of Computer Science, University of Illinois at Urbana-Champaign, 2005.

6.3 Internet Dissemination

The following products have resulted from this project, and are freely available through the Internet:

- The general website for this project can be found at
  http://charm.cs.uiuc.edu/grants/petaflops.html

- Information about the emulation software, and instructions for downloading, are available at
  http://charm.cs.uiuc.edu/ppl_research/bluegene

- Enhancements to the Charm++ distribution, including all the simulations tools that we developed, are available at
  http://charm.cs.uiuc.edu

- Materials from all Charm++ workshops, including archivals of tutorial presentations, are available at
  http://charm.cs.uiuc.edu/workshops