

Eric J. Bohm

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Education

B.S. Computer Science, May 1992, State University of New York at Buffalo, New York, USA

Research and Professional Experience

Senior Scientist: Charmworks, Inc.: Feb 2014—present
Senior Research Programmer: Univ. Illinois Urbana-Champaign: July 2008—present
Research Programmer: Univ. Illinois Urbana-Champaign: Nov 2003—July 2008
Application Architect: WebMD Corporation: 1999—2001
Enterprise Application Architect: MEDE America Corporation: 1996—1999
Director of National Software Development: Latpon R&D Corporation: 1995—1996
Director of Software Development: Latpon Corporation: 1992—1995

Professional Societies and Activities (past 5 years)

Member: ACM

Research Interests

Extremely Scalable Parallel Programming	Irregular Parallel Problems
Computational Science and Engineering	Network Architecture
Parallel Discrete Event Simulation	Molecular Dynamics
Parallel Performance Prediction	Quantum Chemistry

Relevant Publications

JAE-SEUNG YEOM, ABHINAV BHATELE, KEITH BISSET, ERIC BOHM, ABHISHEK GUPTA, LAXMIKANT KALE, MADHAV MARATHE, DIMITRIOS NIKOLOPOULOS, MARTIN SCHULZ, LUKASZ WESOLOWSKI, "Overcoming the Scalability Challenges of Epidemic Simulations on Blue Waters", in Proceedings of the IEEE International Parallel & Distributed Processing Symposium, IPDPS '14, 2014

MINJUNG KIM, SUBHASISH MANDAL, ERIC MIKIDA, KAVITHA CHANDRASEKAR, ERIC BOHM, NIKHIL JAIN, QI LI, GLENN MARTYNA, LAXMIKANT KALE, SOHRAB ISMAIL-BEIGI "Scalable GW software for quasiparticle properties using OpenAtom." . Computer Physics Communications. Volume 244, November 2019, Pages 427-441

NIKHIL JAIN, ERIC BOHM, ERIC MIKIDA, SUBHASISH MANDAL, MIJUNG KIM, PRATEEK JINDAL, QI LI, SOHRAB ISMAIL-BEIGI, GLENN MARTYNA, LAXMIKANT KALE. "OpenAtom: Scalable Ab-Initio Molecular Dynamics with Diverse Capabilities." ISC High Performance 2016: High Performance Computing. pp 139-158.

JAMES C. PHILLIPS, YANHUA SUN, NIKHIL JAIN, ERIC J. BOHM, LAXIMANT V. KALE "Mapping to Irregular Torus Topologies and Other Techniques for Petascale Biomolecular Simulation", in Proceedings of ACM/IEEE SC 2014

LAXMIKANT KALE, OSMAN SAROOD, ERIC BOHM, NIKHIL JAIN, AKHIL LANGER, ESTEBAN MENESES, "Position Paper: Actionable Performance Modeling for Future Supercomputers", in MODSIM 2013, 2013

ABHINAV BHATELE, LUKASZ WESOLOWSKI, ERIC BOHM, EDGAR SOLOMONIK, LAXMIKANT V. KALE, “Understanding application performance via micro-benchmarks on three large supercomputers: Intrepid, Ranger and Jaguar”, *International Journal of High Performance Computing Applications (IJHPCA)*, November 2010 vol. 24 no. 4, pg 411-427

ERIC BOHM, ABHINAV BHATELE, LAXMIKANT V. KALE, MARK E. TUCKERMAN, SAMEER KUMAR, JOHN A. GUNNELS AND GLENN J. MARTYNA, “Fine grained parallelization of the Car-Parrinello ab initio MD method on Blue Gene/L”, in *IBM Journal of Research and Development: Applications of Massively Parallel Systems*, Volume 52, 1/2, 159-174, 2008.

LAXMIKANT V. KALE, ERIC BOHM, CELSO L. MENDES, TERRY WILMARTH, GENGBIN ZHENG, “Programming Petascale Applications with Charm++ and AMPI.”, In *Petascale Computing: Algorithms and Applications*, pg 421-441, Chapman & Hall / CRC Press, ed D. Bader, 2004.

NILESH CHOUDHURY, YOGESH MEHTA, TERRY L. WILMARTH, ERIC J. BOHM AND LAXMIKANT V. KALE, “Scaling an Optimistic Parallel Simulation of Large-scale Interconnection Networks”, in *Proc. of the Winter Simulation Conference*, 2005.

Synergistic Activities

- Collaborative development of **CharmSimdemics**, a framework for the simulation of contagion effects in social networks, especially disease propagation in human populations.
- Principle Investigator of the **AMPI** project at **Charmworks**. This project is modifying the **AMPI++** framework to improve its quality and suitability for use in industry and other commercial contexts. The prior phase of this work included participation in the NSF I-Corps program, and directing a team in the analysis and improvement of the **Charm++** runtime system source code.
- Principle Investigator of the commercialization effort for **Quinoa** a highly scalable CFD engine, as part of a new collaboration between Charmworks, Inc. and Los Alamos National Laboratory.
- Principle Investigator of the ExORun project. ExORun is a new effort to extend the dynamic load balancing capabilities of Charm++ to exascale, and to make those features accessible to MPI programs via a library based application programming interface.s
- Assisting in development of **Charm++ and AMPI**, parallel programming systems used as research tools in Science and Engineering. Charm++ includes an adaptive runtime system that supports dynamic load balancing strategies, fault tolerant protocols, automatic communication optimizations and libraries. It also includes **Projections**, an effective parallel performance analysis system.
- Leading development of **OpenAtom**, a highly scalable Car-Parrinello ab initio molecular dynamics application. Currently designing the integration of GW-BSE methods to support accurate simulations of system with excited electron states.
- Collaborative development of **NAMD** a parallel program for biomolecular simulations used by a large number of researchers in biophysics and chemistry.
- Collaborative development of **POSE**, a framework for parallel discrete event simulation.
- Prior to academia, he led commercial software development teams for many projects at WebMD, MedE America, and Latpon corporations.