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## BIOGRAPHICAL SKETCH

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NAME David Swanson	POSITION TITLE Research Associate Professor		
eRA COMMONS USER NAME N/A			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Nebraska Wesleyan University (Lincoln, NE)	B.S.	1987	Chemistry
University of Nebraska-Lincoln (Lincoln, NE)	Ph.D.	1995	Physical Chemistry

### A. Positions and Honors

#### Professional Experience

- 1996 NSF/NATO Postdoctoral Fellow, Technical University of Wroclaw (Wroclaw, Poland)
- 1997 – 1999 National Research Council Research Associate, Naval Research Laboratory (NRL)
- 1999-2004 Coordinator, Research Computing Facility, University of Nebraska-Lincoln
- 2000 – Present Research Assistant/Associate Professor, Computer Science and Engineering, University of Nebraska-Lincoln
- 2004 – Present Director, Holland Computing Center, University of Nebraska-Lincoln

#### Professional Affiliations and Awards

- Co-Chair, High Performance Computing Working Session, DOE-EPSCoR Workshop, Brookhaven National Laboratory, May 30-31, 2001.
- Manager, GPN Virtual Organization in the Open Science Grid, 2006-2009.
- wLCG (worldwide LHC Computing Grid) Collaboration Board Member, 2006-2007

### B. Selected peer-reviewed publications

1. Sumanth J.V, **David R. Swanson**, and Hong Jiang, "Adaptive Load-Balancing for Force-Decomposition Based 3-Body Molecular Dynamics Simulations in A Heterogeneous Distributed Environment with Variable Number of Processors", to appear in the Proceedings of The 2007 International Conference on Parallel Processing (ICPP'07), Xi'an, China, September 10-14, 2007.
2. Sumanth J.V, **David R. Swanson**, and Hong Jiang, "Novel Force Matrix Transformations with Optimal Load-Balance for 3-body Potential based Parallel Molecular Dynamics in a Heterogeneous Cluster Environment", to appear in the Proceedings of the 21st ACM International Conference on Supercomputing (ICS'07), Seattle, WA, USA, June 16-20, 2007.
3. Sumanth Jannyavula-Venkata, **David R. Swanson**, and Hong Jiang, "Scheduling Many-Body Short Range MD Simulations on A Cluster of Workstations and Custom VLSI Hardware", Lecture Notes in Computer Science (LNCS), ISSN: 0302-9743, Springer, December 2004, Editors: Luc Bouge and Viktor K. Prasanna. (Proceedings of International Conference on High Performance Computing (HiPC2004), Bangalore, India, Dec.19-22, 2004.)
4. Jameela Al-Jaroodi, Nader Mohamed, Hong Jiang, **David Swanson**, "JOPI: a Java object-passing interface," *Concurrency and Computation: Practice and Experience*, Volume 17, Issue 7-8, 2005, Pages 775-795, Copyright © 2005 John Wiley & Sons, Ltd.
5. C. T. White, **D. R. Swanson** and D. H. Robertson (2001) Molecular Dynamics Simulations of Detonations, *Chemical Dynamics in Extreme Environments*, Ed. Rainer A. Dressler, World Scientific, Singapore, p.546-592.
6. Xiao Qin, Hong Jiang, Yifeng Zhu , and **David R. Swanson**, "Dynamic Load Balancing for I/O-Intensive Tasks on Heterogeneous Clusters", Lecture Notes in Computer Science (LNCS 2913), Springer, December 2003, pp. 300-309, Editors: Timothy M. Pinkston and Viktor K. Prasanna.(Proceedings of International Conference on High Performance Computing (HiPC2003), Hyderabad, India, Dec.17-20, 2003.
7. Yifeng Zhu, Hong Jiang, Xiao Qin, Dan Feng, and **David R. Swanson** and C. T. White (2001) Steady Flow Detonations from Molecular Dynamics Simulations, in *Shock Compression of Condensed Matter 2000*, Eds. M. D. Furnish, L. C. Chhabildas and R. S. Hixson, AIP Press, Melville, New York.. "Exploiting Redundancy to Boost Performance in a RAID-10 Style Cluster-based File System" *Journal of Cluster Computing*, Vol. 9, No. 4, October, 2006, pp. 433-447.

8. **David R. Swanson** and C. T. White (2001) Steady Flow Detonations from Molecular Dynamics Simulations, in *Shock Compression of Condensed Matter 2000*, Eds. M. D. Furnish, L. C. Chhabildas and R. S. Hixson, AIP Press, Melville, New York.
9. "The CMS Experiment at the CERN LHC," *Journal of Instrumentation*, 2008 (co-author).
10. Jameela Al-Jaroodi, Nader Mohamed, Hong Jiang and **David Swanson**, "An Overview of Parallel and Distributed Java for Heterogeneous Systems: Approaches and Open Issues," in *Algorithms and Tools for Parallel Computing On Heterogeneous Clusters*, Nova Science Publishers, ISBN: 1-60021-049-X, 2006.

## C. Research Support

### *Recent Research Support*

*National Science Foundation (NSF)* (Swanson, PI) 2005-2010

US CMS Tier-2 Site at UNL

This multiyear award funds the building and maintenance of a Tier-2 site for US CMS software and computing. As part of the infrastructure for a large LHC experiment, integration with the Open Science Grid has been a primary role.

*NSF* (Swanson, co-PI) 2006 – 2009

HEC: Collaborative Research SAM<sup>2</sup> Toolkit: Scalable and Adaptive Metadata Management

Work on this project included instrumenting and testing the performance of dCache, the production file system for US CMS. Current work includes performance testing and enhancement of hdfs (hadoop distributed file system).

*NSF* (Swanson, PI) 2006 – 2009

MRI: Instrument Acquisition: Acquisition of Affordable Shared-memory Computing and Scalable Storage for Scientists and Engineers

This project resulted in the acquisition of a 512 GB shared-memory Altix, as well as an Infiniband connected set of multi-core nodes for UNL campus researchers. We also added hdfs storage and a revamped NFS file-server from SUN.

*NSF* (Swanson, PI) 2008 – 2009

Open Science Grid Consortium – sub award (UW)

This project resulted in the hire of a postdoc who implemented significant improvements in measurements and metrics for OSG.

*DOE (FNAL)* (Swanson, PI) 2008-2009

US CMS Software Development – sub award (FNAL)

This project included the hire of a postdoc who improved grid interfaces to scalable storage, as well improvements and tests required to utilize hdfs in a grid environment.

*NSF* (Swanson, PI) 2003 – 2006

MRI: Instrument Acquisition: High Performance Computing and Data Visualization for Scientists and Engineers

This project resulted in a large 64-bit campus cluster (256 cores connected via Myrinet), and the building of a rear projection Tile Wall Display.

*NSF-EPSCoR* (Swanson, co-PI) 2001 – 2004

Secure Distributed Information Infrastructure

This project resulted in a large 32-bit campus cluster (256 cores connected via Myrinet), the addition of several Access Grid nodes, and a significant research effort in distributed storage and computing, as well high-performance networking.