

Paul R. Brenner, PhD, PE

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APPOINTMENTS: RESEARCH, ENGINEERING, AND MANAGEMENT

Center for Research Computing, The University of Notre Dame, Indiana 2007 - Present
Associate Director, High Performance Computing; Associate Professor of the Practice

- Advance computation based research through HPC system design, deployment, operation and support
- Direct HPC user support: instruction, collaborative documentation & operational communications
- Conduct HPC research and grant development to grow computational infrastructure and capabilities
- Lead a research team at the intersection of HPC innovation and Computational Social Science
- Develop and enhance national technical collaborations with XSEDE, CASC, SC and I2 communities

U.S. Air Force Reserves, Engineering Officer (Traditional Reservist) 1998 - Present
434th Air Wing, Mission Support Group, Grissom ARB, Indiana 2015 - Present

- Deputy Group Commander (of approximately 500 personnel)

434th Air Wing, Civil Engineer Squadron, Grissom ARB, Indiana 2009 - 2015

- Engineering Squadron Commander (of approximately 150 personnel)

U.S. DSRC High Performance Computing Center, Wright Patterson AFB, Ohio 2005 - 2009
445th Air Wing, Civil Engineer Squadron, Wright Patterson AFB, Ohio 1998 - 2009

McGill AirClean Corporation, Columbus, Ohio 2000 - 2003
Manager Civil/Structural Engineering

- Managed structural engineers, designers, and manufacturing planners in development and fabrication

APPOINTMENTS: TEACHING

University of Notre Dame, Notre Dame, IN 2003 - Present
Assoc. Prof of Practice (2015-Present), Research Asst. Prof (2009-2015), Grad Asst. (2003-2007)

- Instructor – Parallel Programming, Data Structures, Undergraduate Research, Service Learning

Columbus State Community College, Columbus, Ohio 2001 - 2003
Adjunct Faculty – Core Physics Sequence

PROFESSIONAL PREPARATION

University of Notre Dame, Notre Dame, IN 2007
Ph.D. Computer Science and Engineering
Field of Research: Computational Biophysics and High Throughput Distributed Systems
Doctoral Dissertation: Parallel Algorithms and Distributed Systems for Computational Biophysics

The Ohio State University, Columbus, OH 2000
M.S. Materials Science and Engineering
Field of Research: Intermetallic Mechanical Behavior and Dislocation Mechanisms
Master's Thesis Title: Ni_xFe₆₀-xAl₄₀ Pseudobinary Bridgework

University of Notre Dame, Notre Dame, IN 1998
B.S. Civil Engineering – Cum Laude

PROFESSIONAL CERTIFICATION/ORGANIZATIONS

Registered Professional Engineer, Ohio
Member – Assoc. for Computing Machinery (ACM), Inst. of Electrical and Electronics Engineers (IEEE)

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RECENT PUBLICATIONS

- 29) A. Howell, P. Brenner
Computational Considerations for a Global Human Well-being Simulation
Euro-Par 2016; Workshop on Parallel and Distributed Agent Based Simulation (PADABS), Aug 2016
- 28) Garret McGrath, Brenden Judson, Paul Brenner, Jared Short, Stephen Ennis
Cloud Event Programming Paradigms: Applications and Analysis
IEEE Cloud 2016 Conference, July 2016
- 27) Anna Woodard, Matthias Wolf, Charles Mueller, Nil Valls, Ben Tovar, Patrick Donnelly, Peter Ivie, Kenyi Hurtado Anampa, Paul Brenner, Doug Thain, Kevin Lannon and Michael Hildreth
Scaling Data Intensive Physics Applications to 10k Cores on Non-Dedicated Clusters with Lobster
IEEE Cluster Conference, September 2015
- 26) M. Garret McGrath, P. Raycroft, P. Brenner
Intercloud Networks Performance Analysis
IEEE International Conference on Cloud Engineering; Workshop on Cloud Computing: Interclouds, Multiclouds, Federations, and Interoperability, Mar 2015
- 25) C. Mazurek, J. Pukacki, M. Kosiedowski, S. Trocha, H. Darbari, A. Saxena, R. Joshi, P. Brenner, S. Gesing, J. Nabrzyski, M. Sullivan, D. Dubhashi, S. Thankaswamy, A. Srivastava; Federated Clouds for Biomedical Research: Integrating OpenStack for ICTBioMed
Third IEEE International Conference on Cloud Networking, Oct 2014
- 24) D. Skeehan, P. Brenner, B. Tovar, D. Thain, N. Valls, A. Woodard, M. Wolf, T. Pearson, S. Lynch, K. Lannon; Opportunistic High Energy Physics Computing in User Space with Parrot
IEEE/ACM Cluster Cloud and Grid Computing Conference, May 2014
- 23) Patrick Raycroft, Ryan Jansen, Mateusz Jarus, and Paul Brenner
Performance Bounded Energy Efficient Virtual Machine Allocation in the Global Cloud; Journal of Sustainable Computing; Vol 4, March 2014
- 22) J. Zack Woodruff, Paul Brenner, Aimee P.C. Buccellato, and David B. Go
Environmentally Opportunistic Computing: A distributed waste heat reutilization approach to energy efficient buildings and data centers; Journal, Energy and Building; Vol 69, February 2014
- 21) Eric M. Ward, Matthew L. Goedke, Paul Brenner, David B. Go
A Simplified Thermodynamic Model for Waste Heat Utilization From a Containerized Data Center Experimental Platform. ITherm Conference 2012
- 20) A. Buccellato, P. Brenner, D. Go
Computation as Catalyst for Sustainability: Environmental Stewardship through Interdisciplinary Research and Design. Building Technology Educator's Society (BTES) Conference 2011
- 19) P. Brenner, D. Thain, A. Buccellato, D. Go
"Environmental Opportunistic Computing," Chapter in Handbook of Energy-Aware and Green Computing (ed. by I. Ahmad and S. Ranka), 2011

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- 18) R. Jansen and P. Brenner
Energy Efficient Virtual Machine Allocation in the Cloud: An Analysis of Cloud Allocation Policies, 2nd IEEE International Green Computing Conference, 2011
- 17) A. Buccellato, P. Brenner, D. Go, R. Jansen, E. Ward
Environmentally Opportunistic Computing: Computation as Catalyst for Sustainable Design
ASHRAE Winter Conference, 2011
- 16) Morcos F, Chatterjee S, McClendon CL, Brenner PR, Lopez-Rendon R, et al. 2010 Modeling Conformational Ensembles of Slow Functional Motions in Pin1-WW. PLoS Computation Biology 6(12): e1001015. Doi:10.1371/journal.pcbi.1001015
- 15) P. Brenner, R. Jansen, D. Go, D. Thain
Environmentally Opportunistic Computing: Transforming the Data Center for Economic and Environmental Sustainability. 1st IEEE International Green Computing Conference, 2010
- 14) M. Witkowski, P. Brenner, R. Jansen, D. Go, E. Ward
Enabling Sustainable Clouds via Environmentally Opportunistic Computing
2nd IEEE International Conference on Cloud Computing Technology and Science, 2010
- 13) M. Lammie, P. Brenner, D. Thain
Scheduling Grid Workloads on Multicore Clusters to Minimize Energy and Maximize Performance
10th IEEE/ACM International Conference on Grid Computing (Grid) 2009
- 12) P. Brenner, D. Thain, D. Latimer
Grid Heating Clusters: Transforming Cooling Constraints into Thermal Benefits
Uptime Institute – IT Lean, Clean, & Green Symposium, Green Enterprise IT Awardee, 2009
- 11) P. Brenner, J. M. Wozniak, D. Thain, A. Striegel, J.W. Peng, and J. A. Izaguirre
Biomolecular Commitor Probability Calculation Enabled by Processing in Network Storage
Journal of Parallel Computing, 2008
- 10) P. Brenner, M. Schroeder, G. Madey
Student Engineers Reaching Out – Case Studies in the Correlation of Service Learning, Active Learning, and Community Based Research.
37th ASEE/IEEE Frontiers in Education Conference, 2007
- 9) P. Brenner, J. M. Wozniak, D. Thain, A. Striegel, and J. A. Izaguirre
Biomolecular Path Sampling Enabled by Processing in Network Storage
Sixth IEEE International Workshop on High-Performance Computational Biology, 2007
- 8) J. M. Wozniak, P. Brenner, D. Thain, A. Striegel, and J. A. Izaguirre
Making the Best of a Bad Situation: Prioritized Storage Management in GEMS
Journal of Future Generation Computer Systems, 2007
- 7) P. Brenner, C. R. Sweet, D. VonHandorf, and J. A. Izaguirre
Accelerating the Replica Exchange Method Through an Efficient All-pairs Exchange
Journal of Chemical Physics, 2007

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- 6) J. M. Wozniak, P. Brenner, D. Thain, A. Striegel, and J. A. Izaguirre
Access Control for a Replica Management Database
Proc Workshop on Storage Security and Survivability, ACM, 2006
- 5) J.M. Wozniak, P. Brenner, D. Thain, A. Striegel and J.A. Izaguirre
Applying Feedback Control to a Replica Management System
Thirty-Eighth Southeastern Symposium on System Theory, SSST '06, 2006
- 4) G. Madey, C. Freeland, P. Brenner
A Service Learning Program for CSE Students
35th ASEE/IEEE Frontiers in Education Conference, 2005
- 3) D. Thain, S. Klous, J. Wozniak, P. Brenner, A. Striegel, J. Izaguirre
Separating Abstractions from Resources in a Tactical Storage System
Supercomputing, 2005
- 2) S. Hampton, P. Brenner, A. Wenger, S. Chatterjee, J. Izaguirre
Biomolecular Sampling: Algorithms, Test Molecules, and Metrics
Lecture Notes in Computational Science and Engineering, 2005
- 1) J. M. Wozniak, P. Brenner, D. Thain, A. Striegel and J. A. Izaguirre
Generosity and gluttony in GEMS: grid enabled molecular simulations
14th IEEE Inter. Symposium on High Performance Distributed Computing, HPDC-14, 2005

SYNERGISTIC ACTIVITIES AND AWARDS

Director, ND Summer Scholars “Research Computing” Track	2011-Present
Faculty Chair of the ND UCAT Software Committee	2012-2015
RAP Faculty Representative on ND Provost’s Faculty Grievance Committee	2012-2015
Co-Chair Resource Intensive Cloud Computing Workshop (hosted by Argonne NL)	2013
Uptime Institute – IT Lean, Clean, & Green Symposium, Green Enterprise IT Awardee • Paper: “Grid Heating Clusters: Transforming Cooling Constraints into Thermal Benefits”	2009
Notre Dame Rev. William A. Toohey Award for Service and Social Justice	2008
Notre Dame CSC Ganey Research Grant Recipient	2006
National Engineering Week – New Faces in Engineering USAF Nominee	2004
**Detailed USAF Military Career Recognitions Available Upon Request	