

Jeremy S. Meredith

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Education

University of Illinois at Urbana-Champaign	Computer Science,	B.S., 1998
Stanford University	Computer Science,	M.S., 2004

Research Interests:

Research interests include scientific visualization and analysis and high performance computing using nontraditional computational architectures. In the arena of scientific visualization, some specific interests lie in large scale, high dimensional data and techniques including multi-temporal or in situ analysis. Emerging architecture research has included graphics processing units (GPUs) and Cell processors, particularly where applicable to trans-petascale applications.

Professional Experience

2005–p	R&D Staff, Future Technologies and Nanomaterials Theory Institute, Computer Science and Mathematics and Center for Nanophase Materials Sciences, ORNL
1998–2005	Computer Scientist, Lawrence Livermore National Laboratory
1997	Avionics Software Engineer, McDonnell-Douglas Aerospace
1996	Computer Scientist, National Institute for Occupational Safety and Health
1993	Visualization Computer Programmer, University of Cincinnati

Awards and Honors

2008	ACM Gordon Bell Prize
2005	R&D100 Award in Software from R&D Magazine
2003	Best in Show Award at DCOM Poster Session
2002	Defense Programs Award of Excellence
2001	Outstanding Effort as part of the CY01 Milestone Team
2000	Outstanding Programmatic Contribution
2000	Outstanding Technical Accomplishment and Leadership
1999	Defense Programs Award of Excellence

Selected Publications

- “High Performance Multivariate Visual Data Exploration for Extremely Large Data,” O. Rübél, Prabhat, H. Childs, J. S. Meredith, C. G. R. Geddes, E. Cormier-Michel, S. Ahern, G. H. Weber, P. Messmer, H. Hagen, B. Hamann, and E. Wes Bethel, *SuperComputing*, Texas, Austin, IEEE Publishing, Piscataway, NJ (2008).
- “Balancing Productivity and Performance on the Cell Broadband Engine,” S. R. Alam, J. S. Meredith, and J. S. Vetter, pp 149–158 in IEEE International Conference on Cluster Computing, Texas, Austin (09/17–20/2007).
- “Analysis of a Computational Biology Simulation Technique on Emerging Processing Architectures,” J. S. Meredith, S. R. Alam, and J. S. Vetter, Sixth IEEE International Workshop on High Performance Computational Biology (HiCOMB) (03/26/2007).
<http://www.hicomb.org/HiCOMB2007/proceedings.html>,
- “Accuracy and Performance of Graphics Processors: A Quantum Monte Carlo Application Case Study,” J. S. Meredith, G. Alvarez, T. A. Maier, T. C. Schulthess, and J. S. Vetter, *Parallel Computing* **35**, 3 (2009).

“New Algorithm to Enable 400+ TFlop/s Sustained Performance in Simulations of Disorder Effects in High- T_c Superconductors,” G. Alvarez, M. S. Summers, D. E. Maxwell, M. Eisenbach, J. S. Meredith, J. M. Larkin, J. Levesque, T. A. Maier, P. R. C. Kent, E. F. D’Azevedo, and T. C. Schulthess, *SuperComputing* **61**, IEEE Publishing, Piscataway, NJ (2008).

Work Performed Under Earlier BES Funding

“Application Kernels on Graphics Processing Units: An Analysis of Hidden Markov Models, Support Vector Machines, Hyperspectral Imaging, and Latent Semantic Indexing,” D. Bremer, J. Johnson, H. Jones, Y. Liu, and J. S. Meredith, *Proceedings of the High Performance Embedded Computing Workshop*, Massachusetts, Lexington, (09/20–22/2005) <http://www.ll.mit.edu/HPEC/agendas/proc05/agenda.html>.

“A Contract Based System For Large Data Visualization,” H. Childs, K. Bonnell, E. Brugger, J. S. Meredith, M. Miller, B. Whitlock, and N. Max, pp. 191–198 in *Proceedings of IEEE Visualization*, ed. by T. Moller, Minnesota, Minneapolis, (10/23–28/2005).

“Material Interface Reconstruction in VISIT,” J. S. Meredith, *Proceedings of the Nuclear Explosives Code Developers Conference*, California, Livermore (2004).

“The Evaluation of GPU-Based Programming Environments for Knowledge Discovery,” J. Johnson and J. S. Meredith, *Proceedings of the High Performance Embedded Computing Workshop*, Massachusetts, Lexington, <http://ll.mit.edu/HPEC/agenda04.htm>, University Press, Sanford, California (09/28–30/2004).

“Solving the Material Interface Reconstruction Problem Using Genetic Programming,” J. S. Meredith, pp. 139-147 in *Genetic Algorithms and Genetic Programming at Stanford*, ed. by J. R. Koza (2002).

“Multiresolution View-Dependent Splat-Based Volume Rendering of Large Irregular Data,” J. S. Meredith and K.-L. Ma; *IEEE Symposium on Parallel and Large Data Visualization and Graphics*, pp. 93–99, ed. by T. Ertl, K. Joy, and A. Varshney, IEEE Press, Piscataway, NJ (10/21–26/092001).

Collaborations Outside ORNL During Past Two Years:

S. Alam, Swiss National Supercomputing Centre; E. Wes Bethel, H. Childs, E. Cormier-Michel, C. Geddes, B. Hamn, Prabhat, P. Rubel, G. Weber, K. Wu, Lawrence Berkeley National Laboratory; H. Hagen, Kasierslautern University of Technology; P. Messmer, Tech-X

Thesis Advisor and Postgraduate-Scholar Sponsor:

Total Graduate Students Advised: 0

Total Postdoctoral Scholars Advised: 0