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Education

Ph.D. in Civil Engineering, December 1998
University of California, Berkeley
Dissertation: "Multigrid Equation Solvers for Large Scale Nonlinear Finite Element Simulations"
Advisor: Professor James Demmel
B.A. in Architecture, June 1983
University of California, Berkeley

Research Experience

Research Scientist, 2004–present
Columbia University
Department of Applied Physics and Applied Mathematics
Technical Staff, 2002–2004
Sandia National Laboratories
Computational Sciences, Computer Sciences and Mathematics Center
John von Neumann Research Fellow, 2000-2002
Sandia National Laboratories
Computational Sciences, Computer Sciences and Mathematics Center
Postdoctoral Appointment, 1999-2000
University of California, Berkeley
With Prof. James Demmel, Department of Computer Science
Graduate Student Researcher, 1996-1998
University of California, Berkeley
Department of Computer Science
Summer Intern, 1998
Lawrence Livermore National Laboratory
Center for Applied Scientific Computing

Selected Peer-Reviewed Publications

- *Toward Textbook Multigrid Efficiency for Fully Implicit Resistive Magnetohydrodynamics*. JCP, Vol. 229, No. 18, p. 6208 – 6219, 2010. [With R. Samtaney and A. Brandt.]
- *Scaling to 150K Cores: Recent Algorithm and Performance Engineering Developments Enabling XGC1 to Run at Scale*, Journal of Physics: Conference Series, Vol. 180, 2009. [With S. Ku, P. Worley, E. D'Azevedo, J. Cummings and C. Chang.]
- *High-Resolution Peripheral Quantitative Computed Tomography Can Assess Microstructural and Mechanical Properties of Human Distal Tibial Bone*, Journal of Bone and Mineral Research, 2009. [Accepted.] [With X. Liu, X. Zhang, K.

- Sekhon, D. McMahon, E. Shane, J. Bilezikian and X. Guo.]
- *Performance of Particle in Cell Methods on Highly Concurrent Computational Architectures*, Journal of Physics: Conference Series, Vol. 78, 2007. [With S. Ethier and N. Wichmann.]
 - *Algebraic Multigrid Techniques for Strongly Indefinite Linear Systems from Direct Frequency Response Analysis in Solid Mechanics*, Computational Mechanics, Vol. 39, No. 4, pp. 497-507, 2007.
 - *Algebraic Multigrid Methods for Constrained Linear Systems with Applications to Contact Problems in Solid Mechanics*, Numerical Linear Algebra with Applications, Vol. 11, Nos. 2-3, pp. 141-153, 2004.
 - *Parallel Multigrid Smoothing: Polynomial Versus Gauss-Seidel*, Journal of Computational Physics, Vol. 188, No. 2, pp. 593-610, 2003. [With M. Brezina, J. J. Hu and R. Tuminaro.]
 - *Ultrascaleable Implicit Finite Element Analyses in Solid Mechanics with over a Half a Billion Degrees of Freedom*, ACM/IEEE Proceedings of SC2004: High Performance Networking and Computing, 2004. [With H. Bayraktar, P. Papadopoulos and T. Keaveny.]
 - *A Distributed Memory Unstructured Gauss-Seidel Algorithm for Multigrid Smoothers*, ACM/IEEE Proceedings of SC2001: High Performance Networking and Computing, 2001.
 - *A Parallel Maximal Independent Set Algorithm*, U.C. Berkeley, Technical Report UCB//CSD-98-993. [Winner of 1998 5th Copper Mountain Conference on Iterative Methods Best Student Paper Award.]

Awards & Honors

- *Gordon Bell Prize*, Supercomputing, 2004.
- *John von Neumann Research Fellowship in Computer Science*, Sandia National Laboratories, 2000-2002.
- *Carl Benz Award for best industrial application*, Mannheim Supercomputer Conference, 1999.
- *Best Student Paper Award*, 5th Copper Mountain Conference on Iterative Methods, 1998.