Mark F. Adams
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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"
Co-chairs: Prof. R.L. Taylor and Prof. James Demmel
B.A. in Architecture, June 1983
University of California, Berkeley

Research Experience

Computer Systems Engineer 4, 2013–present
Computational Research Division
Lawrence Berkeley National Laboratory
Applied Numerical Algorithms Group
Adjunct Research Scientist, 2013– present
Columbia University
Department of Applied Physics and Applied Mathematics
Research Scientist, 2004–2013
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

Research Interests

Multigrid and Multilevel Methods, Nonlinear Matrix-Free Multigrid Equation
Solvers, Large Scale Scientific Computing, Numerical Methods and Analysis,
Plasma Physics Simulations, Computational Mechanics, Parallel Finite Element
Methods.

Journal 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.]
- *High-Resolution Peripheral Quantitative Computed Tomography Can Assess Microstructural and Mechanical Properties of Human Distal Tibial Bone*, Journal of Bone and Mineral Research, Vol. 25, No. 4, p. 746-756, 2010. [With X. Liu, X. Zhang, K. Sekhon, D. McMahon, E. Shane, J. Bilezikian and X. Guo.]
- *Algebraic Multigrid Techniques for Strongly Indefinite Linear Systems from Direct Frequency Response Analysis in Solid Mechanics*, Computational Mechanics, Vol. 39, No. 4, p. 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, p. 141-153, 2004.
- *Parallel Multigrid Smoothing: Polynomial Versus Gauss-Seidel*, Journal of Computational Physics, Vol. 188, No. 2, p. 593-610, 2003. [With M. Brezina, J. J. Hu and R. Tuminaro.]
- *Evaluation of Three Unstructured Multigrid Methods on 3D Finite Element Problems in Solid Mechanics*, International Journal for Numerical Methods in Engineering, Vol. 55, No. 1, p. 519-534, 2002.
- *Parallel Multigrid Solvers for 3D Unstructured Finite Element Problems in Large Deformation Elasticity and Plasticity*, International Journal for Numerical Methods in Engineering, Vol. 48, No. 8, p. 1241-1262, 2000.

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.