Osni A. Marques
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 50F-1650
Berkeley, CA 94720-8139
phone: (510) 486-5290
fax: (510) 486-5812
OAMarques@lbl.gov, *http://crd.lbl.gov/~osni*

Education

D.Sc. Structural Engineering, Federal University of Rio de Janeiro, Brazil, 1991
M.Sc. Structural Engineering, Federal University of Rio de Janeiro, Brazil, 1986
A.B. Civil Engineering, State University of Londrina, Brazil, 1983

Professional Experience

Staff Scientist, Lawrence Berkeley National Laboratory, 2003-
Computer Systems Engineer III, Lawrence Berkeley National Laboratory, 1996-2003
Assistant Research Engineer V, University of California at Berkeley, 1996-2004
Research Associate, CERFACS, Toulouse, France, 1994-1995
Post-doctoral Fellow, CERFACS, Toulouse, France, 1993-1994

Industrial Research and Technology Transfer

Consultant, Inktomi Corporation, San Mateo, CA, 1997-1998
Research Associate, PETROBRAS (Brazilian Petroleum Company), Brazil, 1987-1991
Consultant, INPE (Brazilian Institute for Spatial Research), Brazil, 1990

Professional Society Memberships

Society for Industrial and Applied Mathematics (SIAM)
Institute of Electrical and Electronic Engineers (IEEE)

Awards

Japanese Society for the Progress of Science, short term visit fellowship, 2008 (University of Tokyo) and 2012 (University of Kyoto)

Selected Publications

1. C. Voemel, S. Tomov, O. Marques, A. Canning, L.-W. Wang and J. Dongarra, *State-of-the-art Eigensolvers for Electronic Structure Calculations of Large Scale Nano-systems*, Journal of Computational Physics, 227:7113-7124, 2008.
2. O. Marques, J. Demmel, C. Voemel and B. Parlett, *A Testing Infrastructure for Symmetric Tridiagonal Eigensolvers*, ACM TOMS, 35, 2008.
3. J. Demmel, O. Marques, C. Voemel and B. Parlett, *Performance and Accuracy of LAPACK's Symmetric Tridiagonal Eigensolvers*, SIAM Journal on Scientific Computing, 30:1508-1526, 2008.
4. C. Voemel, S. Tomov, L.-W.-Wang, O. Marques and J. Dongarra, *The Use of Bulk States to Accelerate the Band Edge State Calculation of a Semiconductor Quantum Dot*, Journal of Computational Physics, 223:774-782, 2007.
5. O. Marques, C. Voemel and J. Riedy, *Benefits of IEEE-754 Features in Modern Symmetric Tridiagonal Eigensolvers*, SIAM Journal on Scientific Computing, 28:1613-1633, 2006.
6. O. Marques, B. Parlett and C. Voemel, *Computations of Eigenpair Subsets with the MRRR Algorithm*, Numerical Linear Algebra with Applications, 13:643-653, 2006.
7. L. A. Drummond and O. Marques, *An Overview of the Advanced CompuTational Software (ACTS) Collection*, ACM TOMS, 31:282-301, 2005.

8. D. W. Vasco, L. R. Johnson and O. Marques, *Resolution, Uncertainty and Whole Earth Tomography*, Journal of Geophysical Research, 108(B1), Jan 10, 2003.
9. D. Bindel, J. Demmel, W. Kahan and O. Marques, *On Computing Givens Rotations Reliably and Efficiently*, ACM TOMS, 28:206-238, 2002.
10. B. N. Parlett and O. Marques, *An Implementation of the dqds Algorithm (positive case)*, Linear Algebra and its Applications, 309:217-259, 2000.

Biographical Sketch

Osni Marques is a member of the Scientific Computing Group, Applied Mathematics and Scientific Computing Department, Computational Research Division, at the Lawrence Berkeley National Laboratory (LBNL). He is the co-principal investigator of the project Advanced CompuTational Software (ACTS) Collection, funded by the Advanced Scientific Computing Research (ASCR, http://www.sc.doe.gov/ascr) Program of the US Department of Energy (DOE). The ACTS Collection (http://acts.nersc.gov) comprises a set of high-performance, robust software libraries and tools, developed mostly at DOE laboratories and universities, which can simplify the development of engineering and scientific application codes by providing solutions to common and important computational problems. The project aims at improving the usability, accessibility and acceptance of the tools, in particular to users of DOE's computer facilities, and to make the tools more widely employed and effective in solving DOE's and the nation's computational problems.

Osni's research interests include the study, implementation and testing of algorithms for the solution of problems in numerical linear algebra, in particular eigenvalue problems, and high-end scientific computing. The eigensolvers he has implemented have been used in applications related to protein motions, acoustics problems in automobile design, structural analyses, and also in applications that require the computation of singular values and singular vectors of large, sparse matrices, for the solution of inverse problems in earth sciences. He has collaborated in a project funded by DOE related to the study of electronic properties of 3D, million-atom semiconductor nanostructures. In this project, he has focused on algorithms for the computation of interior eigenstates of quantum dots and nanowires. Osni has also collaborated in a project funded by NSF for further development of the LAPACK and ScaLAPACK libraries of algorithms for dense linear algebra calculations. As part of this project, he developed an infrastructure for exhaustively testing the tridiagonal eigensolvers implemented in LAPACK.

From mid-2008 through mid-2010, Osni was assigned on detail from LBNL to DOE in Washington DC, where he provided specialized expertise for the Computer Science Research Program of the Computational Science Research and Partnerships (SciDAC) Division of ASCR. Under this assignment, he contributed to define the scientific focus and direction of the Program, preparation of calls for proposals, organization of independent peer reviews, recommendation of funding allocations, organization of principal investigator meetings, monitoring of the scientific progress of existing projects, and ascertaining of research needs in the Program.