Curriculum Vitae

ROUMMEL F. MARCIA, PH.D.

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RESEARCH INTERESTS

Scientific computation, large-scale optimization, interior-point methods, numerical analysis, global optimization, mathematical biology, compressed sensing, signal processing

EDUCATION

2002	Ph.D. in Mathematics, University of California, San Diego, CA Thesis: *Primal-dual interior-point methods for large-scale optimization* Dr. Philip E. Gill, Advisor
1995	B.S. in Mathematics, Columbia University, New York, NY
1993-1994	Clare College, Cambridge University, UK

PROFESSIONAL EXPERIENCE

2007 – Present	Research Scientist. Department of Electrical and Computer Engineering, Duke University
2006 – 2007	Research Scientist. BACTER Institute, University of Wisconsin-Madison
2004 – 2006	Post-doctoral Fellow. Computation and Informatics in Biology and Medicine, University of Wisconsin-Madison
2003 – 2004	Post-doctoral Researcher. Departments of Biochemistry and Mathematics, University of Wisconsin-Madison
2002 – 2003	Post-doctoral Researcher. San Diego Supercomputer Center, University of California, San Diego
1995 – 2001	Teaching/Research Assistant. Department of Mathematics, University of California, San Diego

GRANTS

National Science Foundation, *Second-order methods for large-scale optimization in compressed sensing*, Principal Investigator, July, 2008 – June, 2011.

PUBLICATIONS

- Danny Dunlavy, Sookhyung Joo, Runchang Lin, Roummel F. Marcia, Aurelia Minut, and Jianzhong, *Numerical steady-state solutions of non-linear DAEs arising in RF communication circuit design*, IMA Preprint Series 1752-1, February, 2001.
- Randolph E. Bank, Philip E. Gill, and Roummel F. Marcia, *Interior methods for a class of elliptic variational inequalities*, in Large-scale PDE-constrained optimization (Santa Fe, NM, 2001), vol. 30 of Lect. Notes Comput. Sci. Eng., Springer, Berlin, pp. 218-235, 2003.

- J. Ben Rosen and Roummel F. Marcia, *Convex quadratic approximation*, Computational Optimization and Applications, **28**, pp. 173-184, 2004.
- James R. Bunch and Roummel F. Marcia, *A pivoting strategy for symmetric tridiagonal matrices*, Numerical Linear Algebra with Applications, **12**, pp. 911-922, 2005.
- Roummel F. Marcia, Julie C. Mitchell, and J. Ben Rosen, *Iterative convex quadratic approximation for global optimization in protein docking*, Computational Optimization and Applications, **32**, pp. 285-297, 2005.
- James R. Bunch and Roummel F. Marcia, *A simplified pivoting strategy for symmetric tridiagonal matrices*, Numerical Linear Algebra with Applications, **13**, pp. 865-867, 2006.
- Roummel F. Marcia, Julie C. Mitchell, and J. Ben Rosen, *Multi-funnel optimization using Gaussian underestimation*, Journal of Global Optimization, **39**:1, pp. 39-48, 2007.
- Roummel F. Marcia, Julie C. Mitchell, and Stephen J. Wright, *Global optimization in protein docking using clustering, underestimation and semidefinite programming,* Optimization Methods and Software, **22**:5, pp. 803-811, 2007.
- Kara L. Lynch, Roy L. Gerona, Eric C. Larsen, Roummel F. Marcia, Julie C. Mitchell, and Thomas F. Martin, *Synaptotagmin C2A loop 2 mediates Ca^{2+}-dependent SNARE interactions essential for Ca^{2+}-triggered vesicle exocytosis*, Molecular Biology of the Cell, **18**:12, pp. 4957-68, 2007.
- Roummel F. Marcia and Rebecca M. Willett, *Compressive coded aperture superresolution image reconstruction*, Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing, Las Vegas, NV, pp. 833-836, 2008.
- Roummel F. Marcia, *On solving sparse symmetric linear systems whose definiteness is unknown*, Applied Numerical Mathematics, **58**:4, pp. 449-458, 2008.
- Roummel F. Marcia and Rebecca M. Willett, *Compressive coded aperture video reconstruction*, Proceedings of the European Conference on Signal Processing, Lausanne, Switzerland, 2008.
- Roummel F. Marcia, Changsoon Kim, Jungsang Kim, David Brady, and Rebecca M. Willett, *Fast disambiguation of superimposed images for increased field of view*, Proceedings of the IEEE Conference on Image Processing, San Diego, CA, pp. 2620-2623, 2008.
- Roummel F. Marcia, Changsoon Kim, Cihat Eldeniz, Jungsang Kim, David Brady, and Rebecca M. Willett, *Superimposed video disambiguation for increased field of view*, Optics Express, 16, pp. 16352-16363, 2008.
- Jennifer B. Erway and Roummel F. Marcia, *Diagonal pivoting strategies for unsymmetric tridiagonal matrices*, Technical Report 2008-12, Department of Mathematics, Wake Forest University.

PRESENTATIONS

- SIAM Optimization Conference, Toronto, Canada, May 2002.
- SIAM Computational Science and Engineering Conference, San Diego, CA, February 2003.
- Research in Computational Molecular Biology, San Diego, CA, March 2004.
- SIAM Annual Meeting, Portland, OR, July 2004.
- Computation and Informatics in Biology and Medicine, UW-Madison, Madison WI October 2004.
- Seventh IMACS Conference on Iterative Methods, Toronto, Canada, May 2005.
- SIAM Optimization Conference, Stockholm, Sweden, May 2005.
- Mathematical Issues in Molecular Dynamics, Banff International Research Station, Canada, June 2005.
- SIAM Annual Meeting, New Orleans, LA, July 2005.

- Computation and Informatics in Biology and Medicine, UW-Madison, Madison WI October 2005.
- Department of Energy GTL Program Workshop, Washington, DC. November 2005.
- 2006 National Library of Medicine Informatics Training, Vanderbilt University, Nashville, TN, June 2006. (Plenary session).
- Midwest Quantitative Biology Conference, Mackinac Island, MI, October 2006.
- Numerical Analysis in Monterey (on the occasion of Bill Gragg's 70th birthday), Naval Postgraduate School, Monterey, CA, November 2006.
- IEEE International Conference on Acoustics, Speech, and Signal Processing, Las Vegas, NV 2008.
- SIAM Optimization Conference, Boston, MA, May 2008.
- Sixteenth European Conference on Signal Processing, Lausanne, Switzerland, August 2008.
- IEEE Conference on Image Processing, San Diego, CA, October 2008.
- SPIE Computational Imaging VII, San Jose, CA, January 2009.

AWARDS and HONORS

San Diego Graduate Fellowship, UC San Diego (1995-1997)
RECOMB 2004 Travel Fellowship
7th IMACS 2005 Conference on Iterative Methods Travel Grant
Computation and Informatics in Biology and Medicine Fellowship (2004-2006)

PROFESSIONAL ACTIVITIES

Chair, Professional Defelopment Evening, 2005 SIAM Annual Meeting
Faculty Moderator, UW-Madison Undergraduate Symposium 2005
Referee, Computational Optimization and Applications Journal
Referee, International Conference on Acoustics, Speech, and Signal Processing 2008, 2009
Referee, IEEE Transactions on Imaging Processing