

CURRICULUM VITAE
RICHARD A. WALTZ

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EDUCATION:

1997-2002 Northwestern University, Evanston, IL
Ph.D. in Computer Engineering
Dissertation Advisor: Prof. Jorge Nocedal
1992-1996 University of Notre Dame, Notre Dame, IN
B. Sc. in Physics

PROFESSIONAL EXPERIENCE:

01/2007-present Research Assistant Professor
Department of Industrial and Systems Engineering
Visiting Scientist, Information Sciences Institute
University of Southern California, Los Angeles, CA, USA
01/2003-present President, Ziena Optimization, Inc.
Co-founder (2001)
<http://www.ziena.com>
01/2003-12/2006 Research Assistant Professor
Department of Electrical Engineering and Computer Science
Northwestern University, Evanston, IL, USA
06/2002-12/2002 Post-doctoral Fellow
Northwestern University, Evanston, IL, USA
06/2001-09/2001 Summer Intern, Math Team
The Mathworks, Inc., Natick, MA
05/1996-08/1997 Physics Research Assistant
University of Notre Dame, Notre Dame, IN, USA

RESEARCH INTERESTS:

Optimization/Mathematical Programming, Numerical Analysis, Scientific Computing, Computational Science, Applications of Optimization, Numerical Software.

AWARDS AND DISTINCTIONS:

1997 Walter P. Murphy Fellowship Award winner

CONSULTING:

2002 Accenture, Chicago, IL
2006-2007 The Mathworks, Natick, MA

GRANTS AWARDED:

National Science Foundation, “Optimization Models and Algorithms for Emergency Response Planning”, 09/2007-09/2010, \$250,000, Grant No. CMMI-0728334. (Co-PI)

National Science Foundation, “Collaborative Research: Investigation and Development of Active Set Prediction Techniques for Nonlinear Optimization”, 08/2007-08/2010, \$269,537, Grant No. CMMI-0728036. (PI)

National Science Foundation, “SBIR Phase I: Integrated Software Tools for Handling Discrete Elements in Large-Scale Nonlinear Optimization”, 01/2007-06/2007, \$99,972, Grant No. IIP-0637769. (PI)

National Science Foundation, “STTR Phase IIB: Integrated Software and Systems for Large-Scale Nonlinear Optimization”, 07/2006-06/2007, \$124,557, Grant No. DMI-0422132. (PI)

National Science Foundation, “STTR Phase II: Integrated Software and Systems for Large-Scale Nonlinear Optimization”, 07/2004-06/2006, \$499,929, Grant No. DMI-0422132. (PI)

National Science Foundation, “STTR Phase I: Integrated Software and Systems for Large-Scale Nonlinear Optimization”, 01/2003-12/2003, \$99,994, Grant No. DMI-0232384. (PI)

EDITORIAL ACTIVITIES:

Referee for:

Computational Management Science (CMS)
Computational Optimization and Applications
Computers and Operations Research
Mathematical Programming
Numerical Algorithms
Operations Research
Optimization and Engineering
SIAM Journal on Optimization
SIAM Journal for Scientific Computing
Transactions on Mathematical Software (TOMS)

PROFESSIONAL ACTIVITIES:

Development Collaborator, Network Enabled Optimization System (NEOS),
Argonne National Laboratory, Argonne, IL, 1998-present.
<http://www-neos.mcs.anl.gov/>
Developed and maintain several internet servers for optimization
and provide technical support for users.

Member, Optimization Technology Center,
Northwestern University-Argonne National Laboratory, 1998–2006.

Member of INFORMS
 Mathematical Programming Society
 Society of Industrial and Applied Mathematics

PRESENTATIONS AND LECTURES:

1. 23 April 2007, Cyberinfrastructure Internship Experience for Graduate Students, Spring Orientation Workshop, San Diego Supercomputer Center, San Diego, CA, USA, "Using High Performance Computing in Optimization Algorithms".
2. 6 Nov 2006, INFORMS 2006 Annual Meeting, Pittsburgh, Pennsylvania, USA, "Ziena Optimization, Inc. - An Overview of the KNITRO Optimization Solver".
3. 6 Nov 2006, INFORMS 2006 Annual Meeting, Pittsburgh, Pennsylvania, USA, "Preconditioning Interior-Point Methods for Nonlinear Optimization".
4. 1 Aug 2006, 19th International Symposium on Mathematical Programming ISMP2006, Rio de Janeiro, Brazil, "Numerical Experience with Preconditioners for Interior-Point Methods".
5. 4 July 2006, 21st European Conference on Operations Research, Reykjavik, Iceland, "Advances in the KNITRO Optimization Software Package".
6. 24 May 2006, Industrial and Systems Engineering Department, University of Southern California, Los Angeles, CA, USA, "Current Challenges in Nonlinear Optimization".
7. 25 October 2005, SIAM Conference on Mathematics for Industry, Detroit, Michigan, USA, "Solving Optimal Power Flow (OPF) Problems Using the KNITRO Nonlinear Optimizer".
8. 16 May 2005, 8th SIAM Conference on Optimization, Stockholm, Sweden, "Active-Set Identification in SLQP Algorithms for Nonlinear Optimization".
9. 10 May 2005, Montreal Days 2005, Montreal, Quebec, Canada, "Adaptive Barrier Procedures for Nonlinear Interior Methods".
10. 24 Oct 2004, INFORMS 2004 Annual Meeting, Denver, Colorado, USA, "Combining Interior-Point and Active-Set Approaches for Nonlinear Optimization in KNITRO".
11. 3 August 2004, International Conference on Continuous Optimization ICCOPT I, Troy, New York, USA, "Advances in Interior-Point Methods for Nonlinear Optimization".
12. 23 June 2004, 40th Workshop on Large Scale Nonlinear Optimization, Erice, Italy, "Advances in SLQP Algorithms for Large-Scale Nonlinear Optimization".
13. 29-31 Mar 2004, European Conference on Computational Optimization EUCCO2004, Dresden, Germany, "An Active-Set Algorithm for Large-Scale Nonlinear Optimization".
14. 19-22 Oct 2003, INFORMS 2003 Annual Meeting, Atlanta, Georgia, USA, "KNITRO: An Integrated Approach for Nonlinear Optimization".
15. 18-22 Aug 2003, 18th International Symposium on Mathematical Programming ISMP2003, Copenhagen, Denmark, "An Active-Set Trust-Region Algorithm for Nonlinear Optimization".
16. 17-20 Nov 2002, INFORMS 2002 Annual Meeting, San Jose, California, USA, "Two Approaches for Nonlinear Programming".
17. 20-22 May 2002, 7th SIAM Conference on Optimization, Toronto, Ontario, Canada, "The SLPEQP Approach for Large-Scale Nonlinear Optimization".
18. 4-7 Nov 2001, INFORMS 2001 Annual Meeting, Miami Beach, Florida, USA, "The SLPEQP Approach for Large-Scale Nonlinear Optimization".
19. Mar 2001, Optimization Seminar, Mathematics and Computer Science Division, Argonne National Laboratory, Argonne, Illinois, USA, "The Successive Linear Programming Approach for Large-Scale Nonlinear Constrained Optimization".

20. Feb 2001, Optimization Seminar, Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Illinois, USA, “The Successive Linear Programming Approach for Large-Scale Nonlinear Constrained Optimization”.
21. Feb 2001, Applied Mathematics Seminar, Laboratory for Computer Science, Massachusetts Institute of Technology, Cambridge, MA, USA, “The Successive Linear Programming Approach for Large-Scale Nonlinear Constrained Optimization”.
22. 7-11 Aug 2000, 17th International Symposium on Mathematical Programming ISMP 2000, Atlanta, Georgia, USA, “Feasible Interior-Point Methods Using Slacks for Nonlinear Optimization”.

CONFERENCE SESSIONS ORGANIZED:

1. Chaired 1 session on Advances in Large-Scale Nonlinear Optimization, INFORMS Annual Meeting, Pittsburgh (2006).
2. Chaired 1 session on Large-Scale Nonlinear Optimization, 19th International Symposium on Mathematical Programming, Rio de Janeiro (2006).
3. Chaired 1 session on Advances in Large-Scale Nonlinear Programming, INFORMS Annual Meeting, San Francisco (2005).
4. Chaired 1 session on Advances in Large-Scale Nonlinear Optimization, 8th SIAM Conference on Optimization, Stockholm (2005).
5. Co-chaired 3 sessions on Large-Scale Nonlinear Optimization, 18th International Symposium on Mathematical Programming, Copenhagen (2003).

PUBLICATIONS:

1. “An Active-Set Algorithm for Nonlinear Programming Using Parametric Linear Programming” (with R. H. Byrd). Technical Report, University of Southern California, Industrial and Systems Engineering Department, Los Angeles, CA 90089, USA, 2007. Submitted for publication.
2. “A Numerical Study of Active-Set and Interior-Point Methods for Bound Constrained Optimization” (with L. Hei and J. Nocedal). Technical Report, Optimization Technology Center, Northwestern University, Evanston, IL 60208, USA, 2006. Submitted for publication.
3. “Steering Exact Penalty Methods for Optimization” (with R. H. Byrd and J. Nocedal). Report OTC 7/2004, Optimization Technology Center, Northwestern University, Evanston, IL 60208, USA, 2006. To appear in *Optimization Methods and Software*.
4. “KNITRO An Integrated Package for Nonlinear Optimization” (with R. H. Byrd and J. Nocedal). In G. di Pillo and M. Roma, editors, *Large-Scale Nonlinear Optimization*, 35-59, 2006. Springer Verlag.
5. “Adaptive Barrier Strategies for Nonlinear Interior Methods” (with J. Nocedal and A. Wächter). Report RC 23563, IBM T. J. Watson Research Center, Yorktown, NY, USA, 2005. Submitted for publication.
6. “On the Convergence of Successive Linear-Quadratic Programming Algorithms” (with R. H. Byrd, N. I. M. Gould and J. Nocedal). *SIAM Journal on Optimization*, 16(2):471-489, 2006.
7. “An Interior Algorithm for Nonlinear Optimization that Combines Line Search and Trust Region Steps” (with J. L. Morales, J. Nocedal and D. Orban). *Mathematical Programming, Series A*, 107(3):391-408, 2006.

8. “An Algorithm for Nonlinear Programming Using Linear Programming and Equality Constrained Subproblems” (with R. H. Byrd, N. I. M. Gould and J. Nocedal). *Mathematical Programming, Series B*, 100(1):27-48, 2004.
9. “Feasible Interior Methods Using Slacks for Nonlinear Optimization” (with R. H. Byrd and J. Nocedal). *Computational Optimization and Applications*, 26(1):35-61, 2003.
10. “Assessing the Potential of Interior Methods for Nonlinear Optimization” (with J. L. Morales, J. Nocedal, G. Liu and J. P. Goux). In L. T. Biegler, O. Ghattas, M. Heinkenschloss and B. van Bloemen Waanders, editors, *Large-Scale PDE-Constrained Optimization*, 30:167-183, Heidelberg, Berlin, New York, 2003. Springer Verlag. Lecture Notes in Computational Science and Engineering.
11. “Algorithms for Large-Scale Nonlinear Optimization”. Ph.D. Dissertation, Northwestern University, Evanston, IL 60208, USA, June 2002.
12. “KNITRO User’s Manual”. Technical Report, Ziena Optimization, Inc., Evanston, IL, USA, October 2004.
13. “Shape of the ^8B Alpha and Neutrino Spectra” (with C. E. Ortiz, A. García, M. Bhattacharya and A. K. Komives). *Physical Review Letters*, Volume 85, Issue 14 (2000), pp. 2909-2912.

SOFTWARE:

- KNITRO optimization software. Copyright TXU 949-923 (2001). Jorge Nocedal, Richard Byrd, Richard Waltz, Mary Beth Hribar, Guanghui Liu, Marcelo Marazzi, Todd Plantenga. Commercial software package for nonlinear optimization implementing an interior-point method.
- Software package for nonlinear optimization implementing an active-set Sequential Linear-Quadratic Programming (SLQP) method. Incorporated into the KNITRO commercial optimization package.