

Curriculum Vitae

1

Michael A. Saunders

September 20, 2008

Personal Data

Home: 2671 Ross Rd, Palo Alto, CA 94303 650-494-0226
Office: Dept of Management Science and Engineering
Stanford University, Stanford, CA 94305-4026 650-723-1875
Internet: saunders@stanford.edu, <http://www.stanford.edu/~saunders>
Birth: January 6, 1944, Christchurch, New Zealand

Education

1965 BSc (Hons), Mathematics, University of Canterbury, New Zealand
1970 MS, Computer Science, Stanford University
1972 PhD, Computer Science, Stanford University

Employment

1965–67 Scientific Officer, Applied Mathematics Division, Dept of Scientific and Industrial Research (DSIR), Wellington, New Zealand
1967–72 Research Assistant and Teaching Assistant, Computer Science Dept, Stanford University; Graduate Study Leave (part salary) from DSIR
1972–74 Scientific Officer, Applied Mathematics Division, DSIR, Wellington, New Zealand
1975–76 Research Associate, Systems Optimization Laboratory, Dept of Operations Research, Stanford University
1977–78 Scientist, Applied Mathematics Division, DSIR, Wellington, New Zealand
1979–87 Senior Research Associate, Systems Optimization Laboratory, Dept of Operations Research, Stanford University
1987–present Research Professor, Systems Optimization Laboratory, Depts of OR, EESOR, and (now) Management Science and Engineering, Stanford University

Other Employment

1972 (Oct) Visiting Research Fellow, Division of Numerical Analysis and Computing, National Physical Laboratory, Teddington, England
1981 (May–Jun) Visiting Scholar, Dept of Mathematics, University of Linköping, Linköping, Sweden
1990 (Jul–Aug) Visiting Fellow, Dept of Operations Research, University of Canterbury, Christchurch, New Zealand
1995–96 Visiting Scholar, IBM Almaden Research Center (2 days/week)
1998 (Jul–Oct) Visiting Professor, Dept of Engineering Science, University of Auckland, New Zealand (taught Master's class on Nonlinear Optimization)
1999 (Aug) Visiting Professor, Institute of Mathematical Modelling (IMM), Technical University of Denmark, Lyngby, Denmark
2000 (Jul) Visiting Professor, Dept of Mathematics and Physics, Mälardalen University, Västerås, Sweden
2001 (Aug) Visiting Professor, IMM, Technical University of Denmark

Honors

1962–64	New Zealand University National Scholarship
1965	New Zealand University Senior Scholarship
1968–71	New Zealand University Postgraduate Scholarship
1967, 1972	U.S. Fulbright Travel Grant
1985	William Orchard-Hays Prize in Computational Mathematical Programming, Mathematical Programming Society, first recipient
1988	Visiting Scientist, Special Year on Numerical Linear Algebra, University of Tennessee and Oak Ridge National Laboratory
1990	Erskine Visiting Fellowship, University of Canterbury, New Zealand
1997	Inventor Recognition Award, Office of Technology Licensing, Stanford University
2001	IBM Faculty Partnership Award
2004	Best Paper award (with M. P. Friedlander), ICCOPT 1, RPI, NY
2004	ISI Highly Cited Researcher, Computer Science
2005	First Prize in software section (with H. H. Jin , M. W. Carter, and Y. Ye) Stanford-Berkeley Innovators' Challenge
2007	ISI Highly Cited Researcher, Mathematics
2007	Elected Hon FRSNZ

Grants

Co-Principal Investigator with Walter Murray

1987–1989	AFOSR	Annual budget	\$ 50,000
1988–1991	DOE	Annual budget	\$316,000
1992–1995	DOE	Annual budget	\$ 75,000
1987–1998	NSF	Annual budget	\$100,000
2000–2002	NSF	Annual budget	\$150,000
2003–2006	NSF	Annual budget	\$172,000
1989–2001	ONR	Annual budget	\$150,000
2002–2004	ONR	Annual budget	\$163,000
2004–2007	ONR	Annual budget	\$170,000
2007–2009	ONR	Annual budget	\$180,000

Co-Principal Investigator with Stephen Boyd and David Donoho

1998–2000	NSF	Annual budget	\$133,000
2001	IBM Faculty Partnership Award,		\$20,000
2001–2003	General Motors, Work Systems Lab,	faculty participant	
2004	Research Gift, Robert Bosch Corp,		\$25,000
2005	Contract, Robert Bosch Corp,		\$108,500
2005	Research Gift, COMSOL Inc,		\$42,000
2005	Birdseed Funding, Stanford OTL,		\$15,000
2008	Stanford/KAUST AEA Agreement,		\$100,000
2008	Member, Technical Area 4, AHPARC,	Stanford	

Professional Affiliations

ACM	Association for Computing Machinery
MPS	Mathematical Programming Society
NAG	Numerical Algorithms Group Limited
ORSNZ	Operational Research Society of New Zealand
SIAM	Society for Industrial and Applied Mathematics
SIAG	SIAM Activity Group on Optimization
SIGPLAN	ACM Fortran Forum

Professional Activities

1982–2004	Associate Editor, <i>ACM Transactions on Mathematical Software</i>
1989–2001	Associate Editor, <i>SIAM Journal on Optimization</i>
1999–present	Associate Editor, <i>Optimization and Engineering</i>
2002–present	Member, International Scientific Advisory Board, New Zealand Institute of Mathematics and its Applications (NZIMA)
1980	Co-organizer, Conference on Practical Optimization, Stanford University
1988	Member, Orchard-Hays Prize committee, Mathematical Programming Society
1999	Organizer, Minisymposium, SIAM Conference on Optimization, Atlanta
2000	Member, Beale/Orchard-Hays Prize committee, Math. Programming Society
2001	Member, Dantzig Dissertation Prize committee, INFORMS
2002	Member, NSF panel for proposals submitted to Operations Research program
2002	Organizer, Minisymposium, SIAM Conference on Optimization, Toronto
2005	Organizer, Minisymposium, IFORS Triennial Conference, Honolulu
2005	Member, Student Paper Competition committee, IMACS
2006	Organizer, Minisymposium, ISMP Triennial Symposium, Rio de Janeiro
2007	Co-organizer, Stanford 50: Conference on State of the Art and Future Directions of Computational Mathematics and Numerical Computing, Stanford University, Mar 29–31
2007	Organizer, Minisymposium, INFORMS Annual Meeting, Seattle
2008	Co-organizer, Symposium on Gene Golub's Legacy: Matrix Computations – Foundation and Future, Stanford University, Mar 1
2008	Technical program committee, MELT08, First ACM International workshop on Mobile Entity Localization and Tracking in GPS-less Environments, San Francisco, Sep 19

Referee for Journals, Publishers, Foundations, etc

ACM Trans. on Math. Software	Acta Numerica 2005
APMOD	APNUM
Applied Numerical Mathematics	BIT
CDC04	Computational Opt. and Applics.
EPSRC (Britain)	European J. of Operational Research
FCAR (Canadian Research Foundation)	IEEE TOIT
IMA J. of Numerical Analysis	IMACS student paper competition
Institute of Physics J. on Inverse Problems	International Science Foundation
Inverse Problems	J. of Combinatorial Optimization

Referee for Journals, Publishers, Foundations, etc (contd)

J. of Comp. and Applied Mathematics	J. of Comp. and Graphical Statistics
J. of Global Optimization	J. of Industrial and Management Optimization
Linear Algebra and Applications	Mathematical Programming
Mathematics and Computers in Simulation	NSERC
NSF	Numerical Algorithms
Numerische Mathematik	NZFRST
NZIMA	NZ J. of Mathematics
Optimization and Engineering	Optimization Methods and Software
ORSA J. on Computing	Parallel Processing Letters
PNAS	RSNZ
SIAM J. on Matrix Analysis	SIAM J. on Optimization
SIAM J. on Scientific Computing	Swedish Research Council for Engineering Sciences
Wiley & Sons, Ltd.	

Consulting

1981–1986	General Electric
1990–present	Barra
1989–present	McDonnell-Douglas (now Boeing)
2000–present	DemandTec (member of Science Advisory Board)
2007–present	Cardinal Optimization (Chief Scientist)

Teaching

1997	EESOR 406 Colloquium, Winter and Spring EESOR 408 Tutorial (3 students)
1998	EESOR 406 Colloquium, Winter EESOR 408 Tutorial (2 students) Master's class, Nonlinear Optimization, Dept of Engineering Science, University of Auckland, New Zealand (12 students)
1999	EESOR 406 Colloquium, Winter EESOR 408 Tutorial (1 student)
2000	MS&E 406 Colloquium, Winter and Spring MS&E 408 Tutorial (1 student)
1989–2001	SCCM Affiliated Faculty member
2001–present	SCCM Core Faculty member
2004–present	iCME Affiliated Faculty member
2003–present	MS&E 318 (CME 338) Large-scale Numerical Optimization http://www.stanford.edu/class/msande318
2001–2004	CS 531 Linear Algebra Seminar
2005–present	CME 510 Linear Algebra and Optimization Seminar http://icme.stanford.edu/seminars/seminar.php?seminar_id=2

Graduate Advising

1987	Engineer, R. Enriken
1988	Engineer, S. K. Eldersveld

1991	PhD co-principal advisor, S. K. Eldersveld
2001	PhD co-principal advisor, M. J. O’Sullivan
2002	PhD principal advisor, M. P. Friedlander, B. Kim
2003	PhD co-principal advisor, C.-M. Fransson
2005	PhD co-principal advisor, Z. Su, H. H. Jin
2006	PhD co-principal advisor, S.-C. Choi
2006	Postdoctoral advisor, H. H. Jin
2008	PhD co-principal advisor, C. Green
2008	PhD principal advisor, H. M. Huynh
Current	PhD co-principal advisor, L. Tenenblat
Current	PhD principal advisor, D. Gleich, C. Maes, N. Henderson, L. Deng, Q. Lee
1979–2008	PhD reading committee member, 54 students
1987–2008	PhD orals committee member, 76 students
1981, 2000	PhD external examiner, J. Eriksson and M. Adlers, Dept of Mathematics, Linköping University, Sweden

Contributions to Books

- [B1] P. E. Gill, W. Murray, B. A. Murtagh, M. A. Saunders and M. H. Wright, GAMS/MINOS, in A. Brooke, D. Kendrick and A. Meeraus, *GAMS: A User’s Guide*, The Scientific Press, Redwood City, CA, 201–224 (1988).
- [B2] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Constrained nonlinear programming, in G. L. Nemhauser, A. H. G. Rinnooy Kan and M. J. Todd (eds.), *Optimization*, Handbooks in Operations Research and Management Science, Volume 1, North-Holland, Amsterdam, 171–210 (1989).
- [B3] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Some theoretical properties of an augmented Lagrangian merit function, in P. M. Pardalos (ed.), *Advances in Optimization and Parallel Computing*, North-Holland, Amsterdam, 101–128 (1992).
- [B4] M. A. Saunders, Commentary on Methods for modifying matrix factorizations, in R. H. Chan, C. Greif, and D. P. O’Leary, *Milestones in Matrix Computation: Selected Works of Gene H. Golub, With Commentaries*, Oxford University Press, Oxford, 310–310 (2007).

Refereed Journal Articles

- [J1] P. E. Gill, G. H. Golub and W. Murray and M. A. Saunders, Methods for modifying matrix factorizations, *Mathematics of Computation* 28, 505–535 (1974).
- [J2] P. E. Gill and W. Murray and M. A. Saunders, Methods for computing and modifying the LDV factors of a matrix, *Mathematics of Computation* 29, 1051–1077 (1975).
- [J3] C. C. Paige and M. A. Saunders, Solution of sparse indefinite systems of linear equations, *SIAM J. Numerical Analysis* 12, 617–629 (1975).
- [J4] C. C. Paige and M. A. Saunders, Least squares estimation of discrete linear dynamic systems using orthogonal transformations, *SIAM J. Numerical Analysis* 14, 180–193 (1977).
- [J5] B. A. Murtagh and M. A. Saunders, Large-scale linearly constrained optimization, *Mathematical Programming* 14, 41–72 (1978).

- [J6] C. C. Paige and M. A. Saunders, Towards a generalized singular value decomposition, *SIAM J. Numerical Analysis* 18, 398–405 (1981).
- [J7] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Aspects of mathematical modelling related to optimization, *Applied Mathematical Modelling* 5, 71–83 (1981).
- [J8] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, A note on a sufficient decrease criterion for a non-derivative steplength procedure, *Mathematical Programming* 23, 349–352 (1982).
- [J9] B. A. Murtagh and M. A. Saunders, A projected Lagrangian algorithm and its implementation for sparse nonlinear constraints, *Mathematical Programming Study* 16 (Constrained Optimization), 84–117 (1982).
- [J10] C. C. Paige and M. A. Saunders, LSQR: An algorithm for sparse linear equations and sparse least squares, *ACM Trans. Math. Software* 8(1), 43–71 (1982).
- [J11] C. C. Paige and M. A. Saunders, Algorithm 583; LSQR: Sparse linear equations and least-squares problems, *ACM Trans. Math. Software* 8(2), 195–209 (1982).
- [J12] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Computing forward-difference intervals for numerical optimization, *SIAM J. Scientific and Statistical Computing* 4, 310–321 (1983).
- [J13] P. E. Gill, N. I. M. Gould, W. Murray, M. A. Saunders and M. H. Wright, A weighted Gram-Schmidt method for convex quadratic programming, *Mathematical Programming* 30, 176–195 (1984).
- [J14] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Sparse matrix methods in optimization, *SIAM J. Scientific and Statistical Computing* 5, 562–589 (1984).
- [J15] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Procedures for optimization problems with a mixture of bounds and general constraints, *ACM Trans. Math. Software* 10, 282–298 (1984).
- [J16] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Trends in nonlinear programming software, *European J. of Operational Research* 17, 141–149 (1984).
- [J17] S. M. Gorelick, C. I. Voss, P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Aquifer reclamation design: the use of contaminant transport simulation combined with nonlinear programming, *Water Resources Research* 20, 415–427 (1984).
- [J18] P. E. Gill, W. Murray, M. A. Saunders, G. W. Stewart and M. H. Wright, Properties of a representation of a basis for the null space, *Mathematical Programming* 33, 172–186 (1985).
- [J19] P. E. Gill, W. Murray, M. A. Saunders, J. A. Tomlin and M. H. Wright, On projected Newton barrier methods for linear programming and an equivalence to Karmarkar’s projective method, *Mathematical Programming* 36, 183–209 (1986).
- [J20] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Maintaining LU factors of a general sparse matrix, *Linear Algebra and its Applications* 88/89, 239–270 (1987).
- [J21] M. A. Saunders, H. D. Simon and E. L. Yip, Two conjugate-gradient-type methods for unsymmetric linear equations, *SIAM J. Numerical Analysis* 25, 927–940 (1988).
- [J22] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Recent developments in constrained optimization, *J. Computational and Applied Mathematics* 22, 257–270 (1988).

- [J23] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, A practical anti-cycling procedure for linearly constrained optimization, *Mathematical Programming* 45, 437–474 (1989).
- [J24] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Inertia-controlling methods for general quadratic programming, *SIAM Review* 33, 1–36 (1991).
- [J25] F. Jarre and M. A. Saunders, An adaptive primal-dual method for linear programming, *Mathematical Programming Society, Committee on Algorithms Newsletter* 19, 7–16 (1991).
- [J26] **S. K. Eldersveld** and M. A. Saunders, A block-LU update for large-scale linear programming, *SIAM J. Matrix Analysis and Applics.* 13, 191–201 (1992).
- [J27] P. E. Gill, W. Murray, D. B. Ponceleón and M. A. Saunders, Preconditioners for indefinite systems arising in optimization, *SIAM J. Matrix Analysis and Applics.* 13, 292–311 (1992).
- [J28] M. A. Saunders, Major Cholesky would feel proud, *ORSA J. on Computing* 6, 23–27 (1994).
- [J29] H.-D. Chen, P. M. Pardalos and M. A. Saunders, The simplex algorithm with a new primal and dual pivot rule, *Operations Research Letters* 16, 121–127 (1994).
- [J30] F. Jarre and M. A. Saunders, A practical interior-point method for convex programming, *SIAM J. Optimization* 5, 149–171 (1995).
- [J31] J. W. Chinneck and M. A. Saunders, MINOS(IIS) version 4.2: Analyzing infeasibilities in linear programming, *European J. Operational Research* 81, 217–218 (1995).
- [J32] P. E. Gill, W. Murray, D. B. Ponceleón and M. A. Saunders, Primal-dual methods for linear programming, *Mathematical Programming* 70, 251–277 (1995).
- [J33] M. A. Saunders, Solution of sparse rectangular systems using LSQR and CRAIG, *Nordisk Tidskr. Informationsbehandling (BIT)* 35, 588–604 (1995).
- [J34] P. E. Gill, M. A. Saunders and J. R. Shinnerl, On the stability of Cholesky factorization for quasi-definite systems, *SIAM J. Matrix Analysis and Applics.* 17(1), 35–46 (1996).
- [J35] M. A. Saunders, Computing projections with LSQR, *Nordisk Tidskr. Informationsbehandling (BIT)* 37:1, 96–104 (1997).
- [J36] W. R. Purcell, L.-X. Cheng, D. D. Dixon, R. L. Kinzer, J. D. Kurfess, M. Leventhal, M. A. Saunders, J. G. Skibo, D. M. Smith and J. Tueller, OSSE mapping of galactic 511 keV positron annihilation line emission, *Astrophysical J.* 491, 725–776, Dec. 1997.
- [J37] S. S. Chen, D. L. Donoho and M. A. Saunders, Atomic decomposition by basis pursuit, *SIAM J. Scientific Computing* 20(1), 33–61 (1998).
- [J38] S. S. Chen, D. L. Donoho and M. A. Saunders, Atomic decomposition by basis pursuit, SIGEST article, *SIAM Review* 43(1), 129–159 (2001).
- [J39] P. E. Gill, W. Murray and M. A. Saunders, SNOPT: An SQP algorithm for large-scale constrained optimization, *SIAM J. Optimization* 12(4), 979–1006 (2002).
- [J40] M. Jacobsen, P. C. Hansen and M. A. Saunders, Subspace preconditioned LSQR for discrete ill-posed problems, *Nordisk Tidskr. Informationsbehandling (BIT)* 43:5, 975–989 (2003).
- [J41] **M. P. Friedlander** and M. A. Saunders, A globally convergent linearly constrained Lagrangian method for nonlinear optimization, *SIAM J. Optimization* 15(3), 863–897 (2005).
- [J42] R. Tibshirani, M. Saunders, S. Rosset, J. Zhu and K. Knight, Sparsity and smoothness via the fused lasso, *J. Royal Statistical Society B* 67(1), 91–108 (2005).

- [J43] P. E. Gill, W. Murray and M. A. Saunders, SNOPT: An SQP algorithm for large-scale constrained optimization, SIGEST article, *SIAM Review* 47(1), 99–131 (2005).
- [J44] M. W. Carter, **H. H. Jin**, M. A. Saunders, and Y. Ye, SpaseLoc: An adaptive subproblem algorithm for scalable wireless sensor network localization, *SIAM J. Optimization* 17(4), 1102–1128 (2006).
- [J45] **M. P. Friedlander** and M. A. Saunders, Discussion: The Dantzig selector: Statistical estimation when p is much larger than n , *Annals of Statistics* 35(6), 2385–2391 (2007).
- [J46] P. E. Gill, W. Murray, M. A. Saunders, J. A. Tomlin and M. H. Wright, George B. Dantzig and systems optimization, *J. Discrete Optimization* 5(2), 151–158 (2008), in memory of George B. Dantzig. <http://dx.doi.org/10.1016/j.disopt.2007.01.002>.
- [J47] **C.-M. Fransson**, T. Wik, B. Lennartson, M. A. Saunders and P.-O. Gutman, Nonconservative robust control: Optimized and constrained sensitivity functions, *IEEE Trans. Contr. Sys. Tech.*, accepted Feb 2008, 11 pp.
- [J48] G. Chantas, N. Galatsanos, A. Likas, and M. A. Saunders, Variational Bayesian image restoration based on a product of t -distributions image prior, *IEEE Trans. Image Processing*, 30 pp., accepted 7 Jun 2008.

Submitted Journal Articles

- [K1] I. Bongartz, A. R. Conn, N. I. M. Gould, M. A. Saunders and Ph. L. Toint, A numerical comparison between the LANCELOT and MINOS packages for large-scale constrained optimization, *Mathematical Programming*, accepted 2000 subject to revision, 19 pp.
- [K2] **M. J. O’Sullivan** and M. A. Saunders, Stabilizing policy improvement for large-scale infinite-horizon dynamic programming, *SIAM J. on Matrix Analysis and Applics.*, accepted Jan 2007 subject to revision, 19 pp.
- [K3] S. P. Ponnappalli, M. A. Saunders, G. H. Golub, and O. Alter, A higher-order generalized singular value decomposition for comparative analysis of large-scale datasets, *SIAM J. Mat. Anal. Appl.*, submitted 15 Nov 2007, revised 15 Aug 2008, 9 pp.
- [K4] D. Kourounis, L. N. Gergidis and M. A. Saunders, Compile-time symbolic differentiation using C++ expression templates, *ACM Trans. on Math. Software*, submitted 25 Feb 2008, 26 pp.

Papers in Preparation

- [P1] V. Pereyra, J. Castillo, and M. A. Saunders, Fast algorithms for convex constrained multiobjective optimization, 14 pp, Sep 2008.
- [P2] C. Maes, R. Fleming, M. A. Saunders, Y. Ye, and B. Ø. Palsson, Practical thermodynamic flux balance analysis, 12 pp, Sep 2008.

Refereed Conference Proceedings

- [C1] G. H. Golub and M. A. Saunders, Linear least squares and quadratic programming, in J. Abadie (ed.), *Integer and Nonlinear Programming*, North-Holland, Amsterdam, 229–256 (1970).
- [C2] R. H. Bartels, G. H. Golub and M. A. Saunders, Numerical techniques in mathematical programming, in J. B. Rosen, O. L. Mangasarian and K. Ritter (eds.), *Nonlinear Programming*, Academic Press, London and New York, 123–176 (1970).

- [C3] M. R. Osborne and M. A. Saunders, Descent methods for minimization, in R. S. Anderssen, L. S. Jennings and D. M. Ryan (eds.), *Optimization*, University of Queensland Press, Queensland, 221–237 (1972).
- [C4] M. A. Saunders, Numerical stability in large-scale linear programming, in F. R. deHoog and C. L. Jarvis (eds.), *Error, Approximation and Accuracy*, University of Queensland Press, Queensland, 144–158 (1973).
- [C5] M. A. Saunders, The complexity of LU updating in the simplex method, in R. S. Anderssen and R. P. Brent (eds.), *The Complexity of Computational Problem Solving*, University of Queensland Press, Queensland, 214–230 (1976).
- [C6] M. A. Saunders, A fast, stable implementation of the simplex method using Bartels-Golub updating, in J. R. Bunch and D. J. Rose (eds.), *Sparse Matrix Computations*, Academic Press, London and New York, 213–226 (1976).
- [C7] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Methods for large-scale nonlinear optimization, in A. M. Erisman, K. W. Neves and M. H. Dwarakanath (eds.), *Electric Power Problems: The Mathematical Challenge*, SIAM, Philadelphia, 352–377 (1980).
- [C8] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, A numerical investigation of ellipsoid algorithms for large-scale linear programming, in G. B. Dantzig, M. A. H. Dempster and M. Kallio (eds.), *Large-scale Linear Programming*, IIASA, Laxenburg, Austria, 487–509 (1981).
- [C9] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, QP-based methods for large-scale nonlinearly constrained optimization, in O. L. Mangasarian, R. R. Meyer, and S. M. Robinson (eds.), *Nonlinear Programming 4*, Academic Press, London and New York, 57–98 (1981).
- [C10] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Linearly constrained optimization, in M. J. D. Powell (ed.), *Nonlinear Optimization 1981*, Academic Press, London and New York, 123–139 (1982).
- [C11] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Software for constrained optimization, in M. J. D. Powell (ed.), *Nonlinear Optimization 1981*, Academic Press, London and New York, 381–393 (1982).
- [C12] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Sequential quadratic programming methods for nonlinear programming, in E. J. Haug (ed.), *Computer Aided Analysis and Optimization of Mechanical System Dynamics*, NATO ASI Series F: Computer and Systems Sciences 9, 679–697 (1984).
- [C13] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Software and its relationship to methods, in P. T. Boggs, R. H. Byrd and R. B. Schnabel (eds.), *Numerical Optimization 1984*, SIAM, Philadelphia, 139–159 (1985).
- [C14] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Model building and practical aspects of nonlinear programming, in K. Schittkowski (ed.), *Computational Mathematical Programming*, NATO ASI Series F: Computer and Systems Sciences 15, Springer-Verlag, Berlin and New York, 209–247 (1985).
- [C15] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Considerations of numerical analysis in sequential quadratic programming methods, in J. P. Hennart (ed.), *Numerical Analysis*, Lecture Notes in Mathematics 1230, Springer-Verlag, New York and London, 46–62 (1986).

- [C16] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, A Schur-complement method for sparse quadratic programming, in M. G. Cox and S. Hammarling (eds.), *Reliable Numerical Computation*, Oxford University Press, Oxford and New York, 113–138 (1990).
- [C17] Y. Y. Shi, R. Nelson, D. H. Young, P. E. Gill, W. Murray and M. A. Saunders, The application of nonlinear programming and collocation to optimal aeroassisted orbital transfers, Proceedings of 30th Aerospace Sciences Meeting, American Institute of Aeronautics and Astronautics, Reno, Nevada (1992).
- [C18] P. E. Gill, W. Murray, D. B. Ponceleón and M. A. Saunders, Solving reduced KKT systems in barrier methods for linear programming, in G. A. Watson and D. Griffiths (eds.), *Numerical Analysis 1993*, Pitman Research Notes in Mathematics 303, Longmans Press, 89–104 (1994).
- [C19] P. E. Gill, W. Murray and M. A. Saunders, Large-scale SQP methods and their application in trajectory optimization, in R. Bulirsch and D. Kraft (eds.), *Control Applications of Optimization*, International Series of Numerical Mathematics, Vol. 115, Birkhäuser Verlag, Basel, Boston, Stuttgart, 29–42 (1994).
- [C20] M. A. Saunders, Cholesky-based methods for sparse least squares: The benefits of regularization, in L. Adams and J. L. Nazareth (eds.), *Linear and Nonlinear Conjugate Gradient-Related Methods*, SIAM, Philadelphia, 92–100 (1996).
- [C21] **C.-M. Fransson**, B. Lennartson, T. Wik, K. Holmström, M. Saunders, and P.-O. Gutman. Global controller optimization using Horowitz bounds, *The 15th IFAC World Congress*, Barcelona, Spain, 2420–2425 (2002).
- [C22] **C.-M. Fransson** and M. A. Saunders, A bisection algorithm for the mixed μ upper bound and its supremum, Proceedings of the 2004 American Control Conference, Boston, MA, Vol. 3, 2665–2670 (2004).

Unrefereed Conference Proceedings

- [U1] M. A. Saunders, Sparse least squares by conjugate gradients: a comparison of preconditioning methods, in J. F. Gentleman (ed.), *Computer Science and Statistics: 12th Annual Symposium on the Interface*, University of Waterloo, Waterloo, Ontario, Canada, 15–20 (1979).
- [U2] P. E. Gill, W. Murray and M. A. Saunders, Fortran software for optimization, Proceedings of the NSF Design, Manufacturing and Industrial Innovation Grantees Meeting, University of California, San Diego, CA, Jan 4–6, 1995, 2 pp.
- [U3] P. E. Gill, W. Murray and M. A. Saunders, SQP methods for large-scale optimization, Proceedings of the NSF Design, Manufacturing and Industrial Innovation Grantees Meeting, University of New Mexico, Albuquerque, NM, Jan 3–5, 1996, 2 pp.
- [U4] P. E. Gill, W. Murray and M. A. Saunders, SNOPT: A Fortran software package to solve large-scale optimization problems, Proceedings of the NSF Design, Manufacturing and Industrial Innovation Grantees Meeting, Monterrey, Mexico, Jan 5–8, 1998, 2 pp.

Computer Software User's Guides

- [G1] B. A. Murtagh and M. A. Saunders, MINOS User's Guide, Report SOL 77-9, Dept of Operations Research, Stanford University (1977), 127 pp.
- [G2] M. A. Saunders, MINOS System Manual, Report SOL 77-31, Dept of Operations Research, Stanford University (1977), 136 pp.

- [G3] B. A. Murtagh and M. A. Saunders, MINOS/AUGMENTED User's Manual, Report SOL 80-14, Dept of Operations Research, Stanford University (1980), 51 pp.
- [G4] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for SOL/QPSOL: a Fortran package for quadratic programming, Report SOL 82-7, Dept of Operations Research, Stanford University (1982), 32 pp.
- [G5] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Documentation for FDCALC and FDCORE, Report SOL 83-6, Dept of Operations Research, Stanford University (1983), 21 pp.
- [G6] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for SOL/QPSOL (revised), Report SOL 83-7, Dept of Operations Research, Stanford University (1983), 36 pp.
- [G7] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for SOL/NPSOL, Report SOL 83-12, Dept of Operations Research, Stanford University (1983), 36 pp.
- [G8] B. A. Murtagh and M. A. Saunders, MINOS 5.0 User's Guide, Report SOL 83-20, Dept of Operations Research, Stanford University (1983), 118 pp.
- [G9] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for SOL/QPSOL (revised), Report SOL 84-6, Dept of Operations Research, Stanford University (1984), 36 pp.
- [G10] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for SOL/NPSOL (revised), Report SOL 84-7, Dept of Operations Research, Stanford University (1984), 36 pp.
- [G11] P. E. Gill, S. J. Hammarling, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for LSSOL (Version 1.0): a Fortran package for constrained linear least-squares and convex quadratic programming, Report SOL 86-1, Dept of Operations Research, Stanford University (1986), 38 pp.
- [G12] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, User's Guide for NPSOL (Version 4.0): a Fortran package for nonlinear programming, Report SOL 86-2, Dept of Operations Research, Stanford University (1986), 54 pp.
- [G13] B. A. Murtagh and M. A. Saunders, MINOS 5.1 User's Guide, Report SOL 83-20R, Dept of Operations Research, Stanford University (1987), 122 pp.
- [G14] B. A. Murtagh and M. A. Saunders, MINOS 5.4 User's Guide, Report SOL 83-20R, Dept of Operations Research, Stanford University (Revised Feb 1995), 135 pp.
- [G15] P. E. Gill, W. Murray and M. A. Saunders, User's guide for QPOPT 1.0: A Fortran package for quadratic programming, Report SOL 95-4, Dept of Operations Research, Stanford University (1995), 38 pp.
- [G16] B. A. Murtagh and M. A. Saunders, MINOS 5.5 User's Guide, Report SOL 83-20R, Dept of Operations Research, Stanford University (Revised Jul 1998), 145 pp.
- [G17] P. E. Gill, W. Murray and M. A. Saunders, User's guide for SQOPT 5.3: A Fortran package for large-scale linear and quadratic programming, Report NA 97-4, Dept of Mathematics, University of California, San Diego (1997), 55 pp.
- [G18] P. E. Gill, W. Murray and M. A. Saunders, User's guide for SNOPT 5.3: A Fortran package for large-scale nonlinear programming, Report NA 97-5, Dept of Mathematics, University of California, San Diego (Revised May 1998), 67 pp.

- [G19] P. E. Gill, W. Murray and M. A. Saunders, User's guide for SQOPT version 7: Software for large-scale quadratic programming, <http://ccom.ucsd.edu/~peg> (2006), 64 pp.
- [G20] P. E. Gill, W. Murray and M. A. Saunders, User's guide for SNOPT version 7: Software for large-scale nonlinear programming, <http://ccom.ucsd.edu/~peg> (2006), 116 pp.
- [G21] Co-author of Optimization Lab User's Guide for COMSOL Script and COMSOL Multiphysics version 3.3, COMSOL AB, Stockholm, Sweden (2006).

Computer Software

- [S1] Co-author, licensed software: LSSOL, MINOS, NPSOL, QPOPT, SNOPT, SQOPT
<http://www.sbsi-sol-optimize.com>
- [S2] Co-author, free software: Atomizer
<http://www-stat.stanford.edu/~atomizer>
- [S3] Author, free software: cgLanczos, LSQR, LUMOD, LUSOL, MINRES, PDCO, SYMMLQ
<http://www.stanford.edu/group/SOL/software.html>

Technical Reports

- [R1] M. A. Saunders, Large-scale linear programming using the Cholesky factorization, Report STAN-CS-72-252, Computer Science Dept, Stanford University (1972), 60 pp.
- [R2] M. A. Saunders, Product form of the Cholesky factorization for large-scale linear programming, Report STAN-CS-72-301, Computer Science Dept, Stanford University (1972), 38 pp.
- [R3] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Two steplength algorithms for numerical optimization, Report SOL 79-25, Dept of Operations Research, Stanford University (1979), 8 pp.
- [R4] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, Computing finite-difference approximations to derivatives for numerical optimization, Report SOL 80-6, Dept of Operations Research, Stanford University (1980), 26 pp.
- [R5] P. E. Gill, N. I. M. Gould, W. Murray, M. A. Saunders and M. H. Wright, Range-space methods for convex quadratic programming, Report SOL 82-14, Dept of Operations Research, Stanford University (1982), 20 pp.
- [R6] P. E. Gill, N. I. M. Gould, W. Murray, M. A. Saunders and M. H. Wright, A range-space method for quadratic programming problems with bounds and general constraints, Report SOL 82-15, Dept of Operations Research, Stanford University (1982), 15 pp.
- [R7] P. E. Gill, W. Murray, M. A. Saunders and M. H. Wright, A note on nonlinear approaches to linear programming, Report SOL 86-7, Dept of Operations Research, Stanford University (1986), 12 pp.
- [R8] P. E. Gill, W. Murray and M. A. Saunders, A single-phase dual barrier method for linear programming, Report SOL 88-10, Dept of Operations Research, Stanford University (1988), 20 pp.
- [R9] P. E. Gill, W. Murray and M. A. Saunders, Interior-point methods for LP: A challenge to the simplex algorithm, Report SOL 88-14, Dept of Operations Research, Stanford University (1988), 14 pp.

- [R10] P. E. Gill, W. Murray, D. B. Ponceleón and M. A. Saunders, Primal-dual methods for linear programming, Report SOL 91-3, Dept of Operations Research, Stanford University (1991), 21 pp.
- [R11] P. E. Gill, W. Murray, D. B. Ponceleón and M. A. Saunders, Solving reduced KKT systems in barrier methods for linear and quadratic programming. Report SOL 91-7, Dept of Operations Research, Stanford University (1991), 26 pp.
- [R12] F. Jarre and M. A. Saunders, Practical aspects of an interior-point method for convex programming, Report SOL 91-9, Dept of Operations Research, Stanford University (1991), 20 pp.
- [R13] P. E. Gill, M. A. Saunders and J. R. Shinnerl, On the numerical stability of quasi-definite systems, Report SOL 93-4, Dept of Operations Research, Stanford University (1993), 8 pp.
- [R14] H. Chen, P. M. Pardalos and M. A. Saunders, The simplex algorithm with a new primal and dual pivot rule, Report SOL 93-5, Dept of Operations Research, Stanford University (1993), 8 pp.
- [R15] M. A. Saunders, Solution of sparse rectangular systems using LSQR and CRAIG, Report SOL 94-4, Dept of Operations Research, Stanford University (1994), 14 pp.
- [R16] M. A. Saunders, Cholesky-based methods for sparse least squares: The benefits of regularization, Report SOL 95-1, Dept of Operations Research, Stanford University (1995), 10 pp.
- [R17] M. A. Saunders, Computation of projections using LSQR, Report SOL 96-1, Dept of Operations Research, Stanford University (1996), 8 pp.
- [R18] M. A. Saunders and J. A. Tomlin, Stable reduction to KKT systems in barrier methods for linear and quadratic programming, Report SOL 96-3, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1996), 9 pp.
- [R19] M. A. Saunders and J. A. Tomlin, Solving regularized linear programs using barrier methods and KKT systems, Report SOL 96-4, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1996), 12 pp.
- [R20] P. E. Gill, W. Murray and M. A. Saunders, SNOPT: An SQP algorithm for large-scale constrained optimization, Report SOL 97-3, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1997), 37 pp.
- [R21] I. Bongartz, A. R. Conn, N. I. M. Gould, M. A. Saunders and Ph. L. Toint, A numerical comparison between the LANCELOT and MINOS packages for large-scale constrained optimization, Report SOL 97-6, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1997), 19 pp.
- [R22] I. Bongartz, A. R. Conn, N. I. M. Gould, M. A. Saunders and Ph. L. Toint, A numerical comparison between the LANCELOT and MINOS packages for large-scale constrained optimization: the complete results, Report SOL 97-7, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1997), 50 pp.
- [R23] M. A. Saunders, Solution of sparse linear equations using Cholesky factors of augmented systems, Report SOL 99-1, Dept of Engineering-Economic Systems and Operations Research, Stanford University (1999), 9 pp.
- [R24] **M. J. O'Sullivan** and M. A. Saunders, Stabilizing policy improvement for large-scale infinite-horizon dynamic programming, Report SOL 2006-1, Dept of Management Science and Engineering, Stanford University (2006), 19 pp.

Plenary Talks since 1991

- [P1] Plenary speaker, Householder Symposium XII, Lake Arrowhead, California, Jun 13–18, 1993.
- [P2] Plenary speaker, “Least Squares Methods: Theory, Algorithms and Applications”, International conference in celebration of Åke Björck’s 60th Birthday, Linköping University, Sweden, Jan 9–10, 1995.
- [P3] Distinguished lecturer, Mathematics Dept, University of California, San Diego, La Jolla, CA, Mar 6–10, 1995.
- [P4] Plenary speaker, Householder Symposium XIII, Pontresina, Switzerland, Jun 17–21, 1996.
- [P5] Keynote speaker, 33rd Annual Conference, Operational Research Society of New Zealand, Auckland, New Zealand, Aug 31–Sep 1, 1998.
- [P6] Keynote speaker, Symposium on Optimisation and Data Analysis in honor of Michael Osborne’s 70th birthday, Canberra, ACT, Australia, Sep 21–23, 2005.
- [P7] Plenary speaker, MOPTA 06: Modeling and Optimization: Theory and Applications, University of Waterloo, Waterloo, ON, Canada, Jul 24–27, 2006.
- [P8] Dash Optimization Lecturer, Center for Applied Optimization, University of Florida, Gainesville, FL, Feb 15, 2007.

Invited Presentations since 1991

- [I1] Invited speaker, 14th International Symposium on Mathematical Programming, Amsterdam, The Netherlands, Aug 5–9, 1991.
- [I2] Speaker and session organizer, TIMS/ORSA Joint National Meeting, San Francisco, California, Nov 2–4, 1992.
- [I3] Invited speaker, Conference on Large-Scale Optimization, University of Florida, Gainesville, FL, Feb 15–17, 1993.
- [I4] Invited speaker, The RAND Corporation, Santa Monica, California, Apr 29, 1993.
- [I5] Invited speaker, Workshop on Operations Research for Managers, Stanford University, Sep 9–11, 1993.
- [I6] Colloquium speaker, Dept of Operations Research, Stanford University, Nov 17, 1993.
- [I7] Minisymposium speaker, Cornelius Lanczos International Centenary Conference, University of North Carolina, Raleigh, North Carolina, Dec 12–17, 1993.
- [I8] Invited speaker, Sparse Days at St Girons, International meeting on Sparse Matrix Methods, St Girons, France, Jul 10–16, 1994.
- [I9] Invited speaker and session organizer, 15th International Symposium on Mathematical Programming, Ann Arbor, Michigan, Aug 15–19, 1994.
- [I10] Speaker, Tenth Annual Operations Research Symposium for Industrial Affiliates and Corporate Friends, Dept of Operations Research, Stanford University, Jan 30, 1995.
- [I11] Distinguished lecturer, Mathematics Dept, University of California, San Diego, La Jolla, CA, Mar 6–10, 1995.

- [I12] Invited speaker, AMS-IMS-SIAM Summer Research Conference on Linear and Nonlinear Conjugate Gradient-Related Methods, University of Washington, Seattle, Jul 9–13, 1995.
- [I13] Speaker, 32nd Australasian Applied Mathematics Conference, Masterton, New Zealand, Feb 4–8, 1996.
- [I14] Minisymposium speaker, 5th SIAM Conference on Optimization, Victoria, BC, May 20–22, 1996.
- [I15] Invited speaker, International Symposium on Optimization and Computation, Hayama, Kanagawa, Japan, Aug 12–16, 1996.
- [I16] Colloquium speaker, Dept of EESOR, Stanford University, Jan 15, 1997.
- [I17] Invited speaker, WSC97-HK, Workshop on Scientific Computing, Chinese University of Hong Kong, Mar 10–12, 1997.
- [I18] Invited speaker, Post-conference of WSC97-HK, Chinese Academy of Sciences, Beijing, Mar 14, 1997.
- [I19] Invited speaker (with P. E. Gill), 16th International Symposium on Mathematical Programming, Lausanne, Switzerland, Aug 24–29, 1997.
- [I20] Colloquium speaker (with W. Murray), Dept of EESOR, Stanford University, Oct 14, 1997.
- [I21] Colloquium speaker, Mathematics Dept, University of Waterloo, Canada, Apr 22, 1998.
- [I22] Invited speaker, 3rd International Conference on High Performance Optimization Techniques, Rotterdam, The Netherlands, Jun 17–19, 1998.
- [I23] Invited speaker, 8th Stockholm Optimization Days, KTH, Stockholm, Sweden, Jun 25–26, 1998.
- [I24] Colloquium speaker, Applied Computational and Industrial Mathematics Seminar, Dept of Mathematics, University of Auckland, New Zealand, Oct 7, 1998.
- [I25] Seminar speaker, Courant Institute, New York University, Mar 12, 1999.
- [I26] Colloquium speaker, Dept of EESOR, Stanford University, Apr 21, 1999.
- [I27] Seminar speaker, Dept of Mathematics, Linköping University, Sweden, Aug 17, 1999.
- [I28] Seminar speaker, Center for Mathematical Modeling, Mälardalen University, Sweden, Aug 20, 1999.
- [I29] Invited speaker, Third Scandinavian Workshop on Linear Programming, Danish Technical University, Lyngby, Aug 26–28, 1999.
- [I30] Colloquium speaker, NERSC, Lawrence Berkeley Laboratory, Berkeley, CA, Oct 29, 1999.
- [I31] Invited speaker, Pacific-West Algorithmic Science Meeting, Washington State University, Pullman, WA, Apr 8, 2000.
- [I32] Invited speaker (with **M. P. Friedlander**), 17th International Symposium on Mathematical Programming, Atlanta, GA, Aug 6–11, 2000.
- [I33] Minisymposium talk (with **M. P. Friedlander**), SIAM Conference on Optimization, Toronto, Canada, May 20–22, 2002.
- [I34] Minisymposium speaker (with **M. J. O’Sullivan**), SIAM Conference on Optimization, Toronto, Canada, May 20–22, 2002.

- [I35] Invited speaker (with **M. J. O’Sullivan**), Householder Symposium XV on Numerical Linear Algebra, Peebles, Scotland, Jun 17–21, 2002.
- [I36] Invited speaker (with Y. Sun and G. H. Golub), Conference on Sparse Matrices and Grid Computing, St Girons, France, Jun 10–13, 2003.
- [I37] Invited paper (with **M. P. Friedlander**), 18th International Symposium on Mathematical Programming, Copenhagen, Denmark, Aug 18–22, 2003.
- [I38] Invited speaker, Sandia CSRI workshop on Solution Methods for Saddle Point Systems in Computational Mechanics, Santa Fe, NM, Dec 3–6, 2003.
- [I39] Invited speaker (with **M. P. Friedlander**), International Conference on Continuous Optimization (ICCOPT 1), RPI, Troy, NY, Aug 2–4, 2004.
- [I40] Invited speaker, Optimization and Transportation Scheduling Workshop, Mount Ruapehu, New Zealand, Sep 8–10, 2004.
- [I41] Invited speaker, Workshop on Optimization and Applications, Oberwolfach, Germany, Jan 9–15, 2005.
- [I42] Invited speaker (with **M. P. Friedlander**), SIAM Conference on Optimization, Stockholm, Sweden, May 15–19, 2005.
- [I43] Invited paper (with U. Ringertz and P. E. Gill), SIAM Conference on Optimization, Stockholm, Sweden, May 15–19, 2005.
- [I44] Invited speaker (with **M. J. O’Sullivan**), IFORS Triennial Conference, Honolulu, HI, Jul 11–15, 2005.
- [I45] Invited paper (with **H. H. Jin** and M. W. Carter), IFORS Triennial Conference, Honolulu, HI, Jul 11–15, 2005.
- [I46] Seminar speaker, Linear Algebra/Optimization seminar, SCCM, Stanford University, Feb 8, 2006.
- [I47] Invited speaker (with **H. M. Huynh**), SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, Feb 22–24, 2006.
- [I48] Invited speaker, Sparse Days at CERFACS, Toulouse, France, Jun 15–16, 2006.
- [I49] Invited speaker (with **H. M. Huynh**), 19th International Symposium on Mathematical Programming, Rio de Janeiro, Brazil, Jul 30–Aug 4, 2006.
- [I50] Invited paper (with **H. H. Jin**), 19th International Symposium on Mathematical Programming, Rio de Janeiro, Brazil, Jul 30–Aug 4, 2006.
- [I51] Invited paper (with **L. Tenenblat**), 19th International Symposium on Mathematical Programming, Rio de Janeiro, Brazil, Jul 30–Aug 4, 2006.
- [I52] iCME seminar speaker, Stanford University, Oct 23, 2006.
- [I53] Invited speaker (with **L. Tenenblat**), INFORMS Annual Meeting, Pittsburgh, PA, Nov 5–8, 2006.
- [I54] Seminar speaker, Numerical Analysis History @ Stanford series, SCCM, Stanford University, Mar 14, 2007.
- [I55] Invited speaker (with **M. P. Friedlander**), West Coast Optimization meeting, University of Washington, Apr 28–29, 2007.

- [I56] Invited speaker (with **S.-C. Choi**), ICIAM 07, 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, Jul 16–20, 2007.
- [I57] Linear Algebra and Optimization seminar speaker, iCME, Stanford University, Oct 3, 2007.
- [I58] Linear Algebra seminar speaker, Mathematics Dept, University of California, Berkeley, Oct 31, 2007.
- [I59] Linear Algebra and Optimization seminar speaker, iCME, Stanford University, Jan 23, 2008.
- [I60] Invited speaker, Symposium on Gene Golub's Legacy: Matrix Computations – Foundation and Future, Stanford University, Mar 1, 2008.
- [I61] Optimization seminar speaker, IWR, University of Heidelberg, Germany, Jun 12, 2008.
- [I62] Invited presentation (with **H. H. Jin**), MMDS08: Workshop on Algorithms for Modern Massive Data Sets, Stanford University, Jun 25–28, 2008.
- [I63] Minisymposium speaker (with **H. H. Jin**), SIAM Annual Meeting, San Diego, Jul 7–11, 2008.
- [I64] PIMS seminar speaker, Computer Science Dept, University of British Columbia, Canada, Aug 7, 2008.

Contributed Presentations

- [T1] Contributed paper (with **M. P. Friedlander**), SIAM Annual Meeting, San Diego, CA, Jul 9–13, 2001.
- [T2] Contributed paper (with J. A. Tomlin), 18th International Symposium on Mathematical Programming, Copenhagen, Denmark, Aug 18–22, 2003.
- [T3] Contributed paper (with **H. H. Jin**, M. W. Carter, and Y. Ye), CORS/INFORMS Meeting, Banff, Alberta, Canada, May 16–19, 2004.
- [T4] Contributed paper (with **H. H. Jin** and M. W. Carter), INFORMS Annual Meeting, Denver, CO, Oct 24–27, 2004.
- [T5] Contributed paper (with **H. H. Jin** and M. W. Carter), SIAM Conference on Optimization, Stockholm, Sweden, May 15–19, 2005.
- [T6] Contributed paper (with **H. H. Jin**), INFORMS Annual Meeting, San Francisco, CA, Nov 13–16, 2005.
- [T7] Contributed paper (with U. Shanbhag and W. Murray), INFORMS Annual Meeting, San Francisco, CA, Nov 13–16, 2005.