Selected Publications

1. On Newton's Method and Nonlinear Simultaneous Replacements, *SIAM J. Numer. Anal.*, 4, (1967), pp. 103–108.

2. A Stationary Newton Method for Nonlinear Functional Equations, *SIAM J. Numer. Anal.*, 4, (1967), pp. 222–232.

3. On Newton–like Methods, *Num. Math.*, 11 (1968), pp. 324–330.

4. (with K.M. Brown) On Newton–like Iteration Functions: General Convergence Theorems and a Specific Algorithm, *Num. Math.*, 12 (1968), pp. 186–191.

5. (with A.A. Goldstein) Cubature and Tchakaloff Cone, *J. Comp. Sys. Sci.*, 3 (1969), pp. 2l8–220.

6. (with R.E. Barnhill and G.M. Nielson), A New Type of Chebyschev Quadrature, *Math. Comp.*, 23 (1969) pp. 437–441.

7. On the Kantorovich Hypothesis for Newton's Method, *SIAM J. Numer. Anal.*, 6 (1969), pp. 493–507.

8. On the Convergence of Newton–Like Methods, *Numerical Methods for Nonlinear Algebraic Equations*, edited by P. Rabinowitz, Gordon and Breach, London, 1970, pp. 163–181.

9. (with K.M. Brown) Derivative–free Analogues of the Levenberg–Marquardt and Gauss Algorithms for Nonlinear Least Squares Approximation, *Numer. Math.*, 18, (1970), pp. 289–297.

10. (with K.M. Brown) A New Algorithm for Nonlinear Least Square Curve Fitting, in Mathematical Software, edited by John R. Rice, Academic Press, New York, 1970, pp. 391–396.

11. On the Convergence of Broyden's Method for Nonlinear Systems of Equations, *Math. Comp.*, 25, (1971), pp. 559–567.

12. Algorithms for Nonlinear Problems which use Discrete Approximations to Derivatives, *Proc. ACM 1971 Nat'l Conf. Chicago.* (By invitation from SIGMAP.

13. Toward a Unified Convergence Theory for Newton–like Methods, in *Nonlinear Functional Analysis and Applications*, edited by L.B. Rall, Academic Press, New York, 1971, pp. 425–472.

14. (with K.M. Brown) On the Second Order Convergence of Brown's Derivative–free Method for Solving Simultaneous Nonlinear Equations, Yale Computer Science TR 71–7, (1971).

15. (with R.A. Sweet) Some Minimum Properties of the Trapezoidal Rule, *SIAM J. Numer. Anal.*, 9 (1972), pp. 230–236.

16. On Some Methods Based on Broyden's Secant Approximation to the Hessian, in *Numerical Methods for Nonlinear Optimization*, edited by F.A. Lootsma, Academic Press, London, 1973, pp. 19–34.

17. Some Computational Techniques for the Nonlinear Least Squares Problem, in *Numerical Solutions of Nonlinear Equations*, edited by G.D. Byrne and C.S. Hall, Academic Press, New York, 1973, pp. 157–183 (By invitation NSF Regional Conference.)

18. (with C.G. Broyden and J.J. Moré) On the Local and Superlinear Convergence of Quasi–Newton Methods, *JIMA*, 12 (1973), pp. 223–246.

19. (with J.J. Moré) A Characterization of Superlinear Convergence of Quasi–Newton Methods, *Math. Comp.*, 28 (1974), pp. 549–560.

20. (with J.F. Traub and R.P. Weber) The Algebraic Theory of Matrix Polynomials, *SIAM J. Numer. Anal.*, 13 (1976), pp. 831–845.

21. (with P.T. Boggs) A Stability Analysis for Perturbed Nonlinear Iterative Methods, *Math. Comp.*, 30 (1976), pp. 1–17.

22. A Brief Survey of Convergence Results for Quasi–Newton Methods in *Nonlinear Programming*, edited by R. Cottle and C. Lemke, *SIAM–AMS Proc.*, 9 (1976), pp. 185–199. (By invitation AMS April '75, NYC.)

23. (with J.J. Moré) Quasi–Newton Methods, Motivation and Theory, *SIAM Review*, 19 (1977), pp. 46–89.

24. Nonlinear Least Squares and Equations, in *The State of the Art in Numerical Analysis*, edited by D. Jacobs, Academic Press, 1977, pp. 269–3l2.

25. (with J.F. Traub and R.P. Weber) Algorithm for Solvents of Matrix Polynomials, *SIAM J. Numer. Anal.*, 15 (1978), pp. 523–533.

26. A Brief Introduction to Quasi–Newton Methods (prepared by invitation for AMS Short Course on Numerical Analysis, Atlanta, January 1978), *Numerical Analysis*, edited by G. Golub and J. Oliger, AMS, 1978, pp. 19–52.

27. (with H.W. Mei) An Unconstrained Optimization Algorithm which uses Function and Gradient Values, *JOTA*, 28 (1979), pp. 453–482.

28. (with R. Schnabel) Least Change Secant Updates for Quasi–Newton Methods, *SIAM Review*, 21 (1979), pp. 443–459.

29. (with R.E. Welsch) Techniques for Nonlinear Least Squares and Robust Regression, *Commun. Statist. Simula. Computa.*, B7(4) (1978), pp. 345–359.

30. (with D.M. Gay and R.E. Welsch) An Adaptive Nonlinear Least Squares Algorithm, *ACM Trans. Math. Software*, 7 (1981), pp. 348–368.

31. (with D.M. Gay and R.E. Welsch) Algorithm 573, NL2S0L—An Adaptive Nonlinear Least Squares Algorithm [E4], *ACM Trans. Math. Software*, 7 (1981), pp. 369–383.

32. (with R. Schnabel) A new derivation of symmetric positive definite secant updates, *Nonlinear Programming IV*, edited by R. Meyer, S. Robinson, Academic Press, 1981, pp. 167–199.

33. (with H.F. Walker) Convergence Theorems for Least–Change Secant Update Methods, *SIAM J. Numer. Anal.*, 18 (1981), pp. 949–987.

34. (with Earl Marwil) Direct Secant Updates of Matrix Factorizations, *Math. Comp.*, 38 (1982), pp. 459–474.

35. Algorithms for Nonlinear Fitting, in *Nonlinear Optimization 1981*, edited by M.J.D. Powell, Academic Press, 1982, pp. 67–78.

36. (with R.B. Schnabel) *Numerical Methods for Unconstrained Optimization and Nonlinear Equations*, Prentice–Hall, 1983, 378 pp. Russian Translation by O. Burdakov appeared (1988), Mir, Moscow.

37. (with H.F. Walker) Inaccuracy in Quasi–Newton Methods: Local Improvement Theorems, *Math. Prog. Study*, 22 (1984), pp. 70–85.

38. Lecture Notes for a Short Course in Unconstrained Optimization, *CURSOS DE MATEMATICA 4*, Consejo Nacional de Investigaciones Cientificas y Tecnicas, I.A.M., Buenos Aires, (1983), pp. 1–32.

39. A User's Guide to Nonlinear Optimization Algorithms, *Proceedings of the IEEE*, 72 (1984), pp. 1765–1776.

40. (with M.R. Celis and R.A. Tapia) A Trust Region Strategy for Equality Constrained Optimization, in *Numerical Optimization 1984*, edited by P.T. Boggs, R.H. Byrd and R.B. Schnabel, SIAM, 1985, pp. 71–82.

41. (with H.F. Walker) Least–Change Secant Update Methods with Inaccurate Secant Conditions, *SIAM J. Numer. Anal.*, 22 (1985) pp. 760–778.

42. (with T. Steihaug) On the Successive Projections Approach to Least Squares Problems, *SIAM J. Numer. Anal.*, 23 (1986) pp. 717–733.

43. (with Kathryn Turner) Generalized Conjugate Directions, *Journal for Linear Algebra and Applications*, 88/89 (1987), pp. 187–209.

44. (with Daniel J. Woods) Optimization on Microcomputers: The Nelder–Mead Simplex Algorithm, in *New Computing Environments: Microcomputers in Large–Scale Computing*, edited by Arthur Wouk, SIAM, Philadelphia, 1987, pp. 116–122.

45. (with M. Morshedi and Kathryn Turner) A Variable-Metric Variant of the Karmarkar Algorithm for Linear Programming, *Math. Prog.*, 39 (1987), pp. 1–20.

46. (with Guangye Li) A Hybrid Algorithm for Solving Sparse Nonlinear Systems of Equations, *Math. Comp.*, 50 (1988), pp. 155–166.

47. (with Daniel J. Woods) Curve Tailoring with Interactive Computer Graphics, *Appl. Math. Letters*, 1 (1988), pp. 41–44.

48. (with Sheng Songbai and Phuong Vu) A Memoryless Augmented Gauss–Newton Method for Nonlinear Least Squares, *Journal of Computational Mathematics*, 6 (1988), pp. 355–375.

49. (with H.J. Martinez and R.A. Tapia) Convergence Theory for the Structured BFGS Secant Method with an Application to Nonlinear Least Squares, *JOTA*, 61 (1989), pp. 161–178.

50. (with R.B. Schnabel) A View of Unconstrained Optimization, invited paper in *Optimization. Handbooks in Operations Research and Management Science, Vol. 1.*, edited by G.L. Nemhauser, A.H.G. Rinnooy Kan, and M.J. Todd, North Holland, Amsterdam, 1989, pp. 1–72.

51. (with N. Echebest, M.T. Guardarucci, J.M. Martínez, H.D. Scolnik, and C. Vacchino) A Curvilinear Search Using Tridiagonal Secant Updates for Unconstrained Optimization, *SIAM Journal on Optimization*, 1 (1991), pp. 333–357.

52. (with Virginia Torczon) Direct Search Methods on Parallel Machines, *SIAM Journal on Optimization*, 1 (1991), pp. 448–474.

53. (with Y. Zhang, R.A. Tapia) On the Superlinear and Quadratic Convergence of Primal–Dual Interior Point Linear Programming Algorithms, *SIAM Journal on Optimization*, 2 (1992), pp. 304–324.

54. (with H. Wolkowicz) Least–Change Secant Methods, Sizing, and Shifting, *SIAM J. Numer. Anal.*, 30 (1993), pp. 1291–1314.

55. (with J.M. Martínez and X. Zhang) Triangular Decomposition Methods for Solving Reducible Nonlinear Systems of Equations, *SIAM Journal on Optimization*, 4 (1994), pp. 358–382.

56. (with Evin Cramer, P. D. Frank, R. M. Lewis, G.R. Shubin) Problem Formulation for Multidisciplinary Optimizaton, *SIAM Journal on Optimization*, 4 (1994), pp. 754–776. A preliminary version appeared as AIAA-92-4752.

57. (with B. Averick, C. Bischof, R. Bixby, A. Carle, A. El-Bakry, M. El-Alem, A. Griewank, G. Johnson, R. Lewis, J. Moré, R. Tapia, V. Torczon, K. Williamson) Research in Optimization on Parallel Computers, *International Journal of Supercomputer Applications*, 8(2), 1994.

58. (with Shou Bai Li and R.A. Tapia) A Unified Approach to Global Convergence of Trust-Region Methods for Nonsmooth Optimization, *Mathematical Programming*, 68 (1995), pp. 319–346.

59. (with Virginia Torczon) Managing Approximation Models in Optimization, *The State of the Art in MDO* edited by N. Alexandrov and Y. Hussaini, SIAM 1997, pp. 330-347.

60. (with Natalia Alexandrov) Multilevel Algorithms for Nonlinear Optimization, *Optimal Design and Control* edited by J. Borggaard, J. Burkardt, M. Gunzburger, and J. Peterson, Birkhäuser PSCT 19, pp. 1-22, 1995

61. (with M. El–Alem, M.C. Maciel) A Global Convergence Theory for Trust-Region-Based Algorithms for Equality Constrained Optimization, *SIAM Journal on Optimization* 7(1), pp.177-207, 1997

62. (with Luis Vicente) On the Convergence Theory of Trust-Region-Based Algorithms for Equality-Constrained Optimization, *SIAM Journal on Optimization* 7(4), pp. 927-950, 1997

63. (with Luis Vicente) Trust-Region Interior-Point Algorithms for Minimization Problems with Simple Bounds, in *Applied Mathematics and Parallel Computing* Festschrift für Professor Dr. Klaus Ritter edited by H. Fischer, B. Riedmüller, and S. Schaffler, Springer, Heidelberg 1996, pp. 97-109.

64. (with Matthias Heinkenschloss, Luis Vicente) Trust-Region Interior-Point Algorithms for a Class of Nonlinear Programming Problems, *SIAM Journal for Control and Optimization*, 36, pp. 1750-1794, 1998.

65. (with Indraneel Das) A Closer Look at Drawbacks of Minimizing Weighted Sums of Objectives for Pareto Set Generation in Multicriteria Optimization Problems, *Structural Optimization* 14(1), pp. 63-69, 1997.

66. (with Natalia Alexandrov, Robert Michael Lewis, and Virginia Torczon) A Trust Region Framework for Managing the Use of Approximation Models in Optimization, *Structural Optimization* 15(1), pp. 16-23, 1998.

67. (with Indraneel Das) Normal–Boundary Intersection: A New Method for Generating Pareto Optimal Points in Nonlinear Multicriteria Optimization Problems, *SIAM Journal on Optimization* 8(3), pp. 631-657, 1998.

68. (with A. Booker, P. Frank, D. Serafini, V. Torczon) Optimization Using Surrogate Objectives on a Helicopter Test Example, in *Optimal Design* edited by J. Burns and E. Cliff, SIAM, Philidelphia 1998.

69. (with A. Booker, P. Frank, D. Serafini, V. Torczon, M. Trosset) A Rigorous Framework for Optimization of Expensive Functions by Surrogates, *Structural Optimization* 17(1), pp. 1-13, 1999.

70. (with Natalia Alexandrov) A Class of General Trust-Region Multilevel Algorithms for Nonlinear Constrained Optimization, submitted for publication.

71. (with M. El–Alem, Karen Williamson) A Trust-Region Algorithm for Least-Squares Solutions of Nonlinear Systems of Equalities and Inequalities, SIAM Journal on Optimization 9(2), pp. 291-315, 1999.

72. (with Charles Audet) Pattern Search Algorithms for Mixed Variable Programming, available as Rice CAAM-TR99-02, accepted for publication in SIAM Journal on Optimization.

73. (with Michael Kokkolaras and Charles Audet) Mixed Variable Optimization of the Number and Composition of Heat Intercepts in a Thermal Insulation System, submitted for publication, available as Rice CAAM-TR00-21.

74. (with Charles Audet) Analysis of Generalized Pattern Searchs, submitted for publication, available as Rice CAAM-TR00-07.

75. (with Charles Audet) A Pattern Search Filter Method for Nonlinear Programming without Derivatives, submitted for publication, available as Rice CAAM-TR00-09.

76. (with S. Sethi and M.R. Wiesner) Optimization of Hollow-Fiber Design and Low-Pressure Membrane System Operation, submitted for publication, Journal of Environmental Engineering.

77. (lightly refereed with Robert Michael Lewis) Problem Formulations and Other Optimization Issues in Multidisciplinary Optimization, AIAA Paper 94-2196, AIAA/NASA/USAF/ISSMO Symposium on Fluid Dynamics, June 1994.

78. (lightly refereed with Natalia Alexandrov) Algorithms for Bilevel Optimization, AIAA Paper 94-4334, AIAA/NASA/USAF/ISSMO Symposium on Multidisciplinary Analysis and Optimization, September 1994.

79. (lightly refereed with Virginia Torczon) Derivative-Free Pattern Search Methods for Multidisciplinary Design Problems, AIAA Paper 94-4349, AIAA/NASA/USAF/ISSMO Symposium on Multidisciplinary Analysis and Optimization, September 1994.

80. (lightly refereed with Andrew J. Booker, Paul D. Frank, Douglas W. Moore, and David B. Serafini) Managing Surrogate Objectives to Optimize a Helicopter Rotor Design - Further Experiments, AIAA Paper 98-4717, September 1998.

81. (lightly refereed with S. Sethi and M.R. Wiesner) Cost Modeling and Optimization Considerations for Low-Pressure Membrane Systems, Proceedings of the Joint ASCE-CSCE Environmental Engineering Conference, Norfolk, Virginia, July, 1999.

82. (lightly refereed with S. Sethi and M.R. Wiesner) Computational Optimization of Hollow-Fiber Ultrafiltration, Paper accepted for presentation at the 2000 Water Quality Technology Conference, Salt Lake City, Utah, to be held in November, 2000.

83. (lightly refereed with S. Sethi and M.R. Wiesner) An Approach to Optimization of Pressure Driven Membrane Processes, Paper accepted for poster presentation at the Annual Conference of the American Water Works Association, Denver, Colorado, June, 2000.

84. (lightly refereed with Charles Audet, Andrew J. Booker, Paul D. Frank, Douglas W. Moore) A Surrogate-Model-Based Method For Constrained Optimization, AIAA MDO, Long Beach.