Vita

Olvi L. Mangasarian

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Personal Data:

Citizenship:	U.S.A.
Marital Status:	Married, 3 children

Education:

B.S.E.	(Engineering) Princeton 1954
M.S.E	(Engineering) Princeton 1955
Ph.D.	(Applied Mathematics) Harvard 1959

Professional Career:

1958-59 Research Fellow, Harvard University

1959-67 Mathematician, Shell Development Company, Emeryville, California

1967-69 Associate Professor, Computer Sciences Department, University of Wisconsin-Madison

1969-2003 Professor, Computer Sciences Department, University of Wisconsin-Madison

1972-75 Chairman, Computer Sciences Department, University of Wisconsin-Madison

1975-76 Senior Research Fellow, Oxford University, England

1976-93 Professor, Industrial Engineering Department, University of Wisconsin-Madison

1982-2003 John von Neumann Professor

2002- Research Scientist, Mathematics Department, University of California at San Diego

2003- John von Neumann Professor Emeritus

Major Areas of Interest:

Optimization

Machine learning & data mining

Professional Societies:

Mathematical Programming Society

Society for Industrial and Applied Mathematics

Institute for Operations Research and the Management Sciences

Papers:

Papers in SIAM Journals, Mathematical Programming, Operations Research, INFORMS Journal on Computing, Data Mining and Knowledge Discovery and others. Recent papers available at: www.cs.wisc.edu/~olvi.

Talks:

Recent talks in the US and overseas available at: www.cs.wisc.edu/~olvi.

Awards, Grants and Consulting Experience:

SIAM Fellow Class of 2011 http://fellows.siam.org/index.php?sort=year&value=2011

2008 Best Academic Research Paper Award, The 2008 International Conference on Data Mining, July 14-17, 2008, Las Vegas, "Privacy-Preserving Classification of Horizontally Partitioned Data via Random Kernels", joint with E. W. Wild. ftp://ftp.cs.wisc.edu/pub/dmi/tech-reports/07-03.pdf

2007 Computational Optimization and Applications Best Paper Award, "Absolute Value Programming", Computational Optimization and Applications 36(1), January 2007, 43-53, ftp://ftp.cs.wisc.edu/pub/dmi/tech-reports/05-04.pdf

US Patent No.7,395,253 July 1, 2008: "Lagrangian Support Vector Machine", joint with David R. Musicant. http://www.cs.wisc.edu/dmi/lsvm/

US Patent No.7,421,417 September 7, 2008: "Input Feature Selection for Support Vector machine Classification", joint with Glenn M. Fung. http://www.cs.wisc.edu/dmi/lpsvm/

INFORMS Lanchester Prize for Mathematical Programming in Machine Learning and Data Mining, November 6, 2000. http://www.informs.org/Prizes/LanchesterDetails.html#2000lanc

University of Wisconsin Hilldale Award in the Physical Sciences 1995-96.

Department of Energy Computational Science Award, September 1994, for "Breast Cancer Diagnosis via Linear Programming".

Sperry Univac 1980-81 Computer Science Professor of the Year.

Principal investigator or co-principal investigator on National Science Foundation grants, 1968-2009.

Investigator on ARO grants 1967-71, 1979-86 and AFOSR grants 1985-1995, 1997-2002.

Sometime consultant to the Argonne National Laboratories, the Ford Foundation, the Organization of American States and the World Bank.

Books and Proceedings:

1. "Nonlinear Programming", McGraw-Hill, New York 1969, Japanese Edition 1971, SIAM Classics in Applied Mathematics 10, Philadelphia 1994.
2. "Nonlinear Programming", coeditor with J. B. Rosen and K. Ritter, Academic Press 1970.
3. "Nonlinear Programming 2", coeditor with R. R. Meyer and S. M. Robinson, Academic Press 1975.
4. "Nonlinear Programming 3", coeditor with R. R. Meyer and S. M. Robinson, Academic Press 1978.
5. "Nonlinear Programming 4", coeditor with R. R. Meyer and S. M. Robinson, Academic Press 1981.
6. "Parallel Methods in Mathematical Programming", coeditor with R. R. Meyer, Mathematical Programming B, Volume 42, Number 2, North Holland 1988.
7. "Symposium on Parallel Optimization 2", coeditor with R. R. Meyer, SIAM Journal on Optimization 1(4), November 1991.
8. "Symposium on Parallel Optimization 3", coeditor with R. R. Meyer, SIAM Journal on Optimization 4(4), November 1994.
9. "Symposium on Parallel Optimization 3: Neural Networks via Mathematical Programming", coeditor with R. R. Meyer, Optimization Methods and Software 4(2), August 1994.

10. "Complementarity: Applications, Algorithms and Extensions", coeditor with M. Ferris and J.-S. Pang, Kluwer Academic Publishers, Boston 2001.
11. "Linear Programming with MATLAB", with M. C. Ferris and S. J. Wright, MPS-SIAM Series on Optimization, SIAM, Philadelphia 2007.

Editorial Responsibilities:

1. Journal of Optimization Theory and Applications, Associate Editor
2. Optimization Methods and Software, Editorial Board Member

Papers:

1. (with B. Budiansky) "Plastic stress concentration at a circular hole in an infinite sheet subjected to equal biaxial tension", J. of Applied Mechanics 27, Series E, 1960, 59-64.
2. "Stresses in the plastic range around a normally loaded circular hole in an infinite sheet", J. of Applied Mechanics 27, Series E, 1960, 65-73.
3. "Duality in nonlinear programming", Quart. of Applied Math. 20, 1962, 300-302.
4. "Numerical solution of the first biharmonic problem by linear programming", International J. of Engineering Science 1, 1963, 231-240.
5. "An elementary proof of an equivalence theorem and duality consequence", J. of the Operations Research Society of Japan 4, 1962, 1970-1975.
6. "Equivalence in nonlinear programming", Naval Research Logistics Quarterly 10, 1963, 299-306.
7. (with J. B. Rosen) "Inequalities for stochastic nonlinear programming problems", Operations Research 12, 1964, 143-154.
8. "Nonlinear programming problems with stochastic objective functions", Management Science 10, 1964, 353-359.
9. "Stability criteria for nonlinear ordinary differential equations", J. SIAM Control 1, 1963, 311-318.
10. (with H. Stone) "Two-person nonzero-sum games and quadratic programming", J. Math. Anal. and Appl. 9, 1964, 348-355.
11. "Equilibrium points of bimatrix games", J. SIAM 12, 1964, 778-780.
12. "Linear and nonlinear separation of patterns by linear programming", Operations Research 13, 1965, 444-452.
13. (with J. Ponstein) "Minmax and duality in nonlinear programming", J. Math. Anal. and Appl. 11, 1965, 504-518.
14. "Pseudo-convex functions", J. SIAM Control 3, 1965, 281-290.
15. "Sufficient conditions for the optimal control of nonlinear systems", J. SIAM Control 4, 1966, 139-152.
16. (with S. Fromovitz) "The Fritz John necessary optimality conditions in the presence of equality constraints", J. Math. Anal. and Appl. 17, 1967, 34-47.
17. "Multi-surface method of pattern separation", IEEE Trans. on Information Theory, IT-14, 1968, 801-807.
18. (with S. Fromovitz) "A maximum principle in mathematical programming", in "Mathematical Theory of Control", A. V. Balakrishnan and L. W. Neustadt (eds.), Academic Press, New York, 1967, 85-95.
19. "Optimality and duality in nonlinear programming", in "Proc. of the Princeton Symposium on Mathematical Programming", H. W. Kuhn (ed.), Princeton University Press, 1970, 429-444.
20. "Nonlinear fractional programming", J. of the Operations Research Society of Japan 12, 1969, 1-10.
21. (with A. Klinger) "Logarithmic convexity and geometric programming", J. Math. Anal. and Appl, 24, 1968, 388-408.
22. "Characterizations of real matrices of monotone kind", SIAM Review 10, 1968, 439-441.
23. "Convexity, pseudo-convexity and quasi-convexity of composite functions", Cahiers du Centre d'Etudes de Recherche Operationnelle 12, 1970, 114-122.
24. "Perron-Frobenius properties of $Ax = \lambda Bx$", J. Math. Anal. and Appl. 35, 1971, 86-102.

25. "A convergent splitting of matrices", Numer. Math. 15, 1970, 351-353.
26. (with L. L. Schumaker) "Splines via optimal control", in "Approximations with Special Emphasis on Splines", I. J. Schoenberg (ed.), Academic Press, New York, 1969, 119-156.
27. (with L. L. Schumaker) "Discrete splines via mathematical programming", SIAM J. Control 9, 1971, 174-183.
28. "Convergent generalized monotone splitting of matrices", Math. Comp. 25, 1971, 649-653.
29. "Monotone splitting of matrices", Linear Algebra and Its Appl. 8, 1974, 43-55.
30. "Techniques of optimization", J. of Engineering for Industry, Trans., ASME 94, Series B., 1972, 365-372.
31. (with L. L. Schumaker) "Best summation formulae and discrete splines", SIAM J. Numer. Anal. 10, 1973, 448-459.
32. "Dual, feasible direction algorithms", in "Techniques of Optimization", A. V. Balakrishnan (ed.), Academic Press, New York, 1972, 67-68.
33. "Second and higher order duality in nonlinear programming", J. Math. Anal. and Appl. 51, 1975, 607-620.
34. "Unconstrained Lagrangians in nonlinear programming", SIAM J. Control 13, 1975, 772-791.
35. "Nonlinear programming theory and computation", in "Handbook of Operations Research", J. J. Modor and S. E. Elmaghraby (eds.), Van Nostrand Reinhold Co., New York, 1978, 245-265.
36. (with U. M. Garcia-Palomares) "Superlinearly convergent quasi-Newton algorithms for nonlinearly constrained optimization problems", Mathematical Programming 11, 1976, 1-13.
37. "Unconstrained optimization methods", in "Proceedings Twelfth Annual Allerton Conference on Circuit and System Theory", Oct. 2-4, 1974, University of Illinois, Urbana-Champaign, 153-160.
38. "Equivalence of the complementarity problem to a system of nonlinear equations", SIAM J. App. Math. 31, 1976, 89-92.
39. "Linear complementarity problems solvable by a single linear program", Mathematical Programming 10, 1976, 263-270.
40. "Unconstrained methods in nonlinear programming", in "Nonlinear Programming", SIAM-AMS Proceedings, Volume IX, American Math. Soc., Providence, Rhode Island, 1976, 169-184.
41. "Solution of linear complementarity problems by linear programming", in "Numerical Analysis Dundee 1975", G. A. Watson (ed.), Lecture Notes in Mathematics 506, Springer-Verlag, Berlin, 1976, 166-175.
42. "Characterization of linear complementarity problems as linear programs", Mathematical Programming Study 7, 1978, 74-87.
43. "Solution of symmetric linear complementarity problems by iterative methods", Journal of Optimization Theory and Applications 22, 1977, 465-485.
44. (with W. R. S. Sutherland) "Solution of the linear inverse vector optimization problem by a single linear program", Mathematical Programming 15, 1978, 232-235.
45. "Simplified characterizations of linear complementarity problems solvable as linear programs", Mathematics of Operations Research 4, 1979, 268-273.
46. "Uniqueness of solution in linear programming", Linear Algebra and Its Applications 25, 1979, 151-162.
47. (with R. R. Meyer) "Nonlinear perturbation of linear programs", SIAM Journal on Control and Optimization 17, 1979, 745-752.
48. "Iterative solution of linear programs", SIAM Journal on Numerical Analysis 18, 1981, 606-614.

49. (with S.-P. Han) "Exact penalty functions in nonlinear programming", Mathematical Programming 17, 1979, 251-269.
50. "Generalized linear complementarity problems as linear programs", Proceedings of the Third International Symposium on Operations Research, Mannheim, September 1-8, 1978, Operations Research Verfahren, Volume 31, 1979, Verlag Anton Hain, Konigstein/Taunus, 1979, 393-402.
51. "Locally unique solutions of quadratic programs, linear and nonlinear complementarity problems", Mathematical Programming 19, 1980, 200-212.
52. "Characterizations of bounded solutions of linear complementarity problems", Mathematical Programming Study 19, 1982, 153-166.
53. "Optimal simplex tableau characterization of unique and bounded solutions of linear programs", Journal of Optimization Theory and Applications 35, 1981, 123-128.
54. "Least-norm linear programming solution as an unconstrained minimization problem", Journal of Mathematical Analysis and Applications 92, 1983, 240-251.
55. "A stable theorem of the alternative: An extension of the Gordan theorem", Linear Algebra and Its Applications 41, 1981, 209-223.
56. "A condition number for linear inequalities and linear programs", in "Methods of Operations Research", Proceedings of 6. Symposium uber Operations Research, Augsburg, 7-9 September 1981, G. Bamberg & O. Opitz (eds.), Verlagsgruppe Athenaum/ Hain/Scriptor/Hanstein, Konigstein 1981, 3-15.
57. (with S.-P. Han) "A dual differentiable exact penalty function", Mathematical Programming 25, 1983, 293-306.
58. "Sparsity-preserving SOR algorithms for separable quadratic and linear programming", Computers and Operations Research 11, 1984, 105-112.
59. (with O. Fujiwara & S.-P. Han) "Local duality of nonlinear programs", SIAM Journal on Control and Optimization 22, 1984, 162-169.
60. (with S.-P. Han) "Conjugate cone characterization of positive definite and semidefinite matrices", Linear Algebra and Its Applications 56, 1984, 89-103.
61. (with S.-P. Han) "Characterization of positive definite and semidefinite matrices via quadratic programming duality", SIAM Journal on Algebraic and Discrete Methods 5, 1984, 26-32.
62. (with S.-P. Han) "Conjugate decomposition of the Euclidean space", Proceedings National Academy of Sciences U.S.A. 30, 1983, 5156-5157.
63. "A condition number for differentiable convex inequalities", Mathematics of Operations Research 10, 1985, 175-179.
64. "Normal solutions of linear programs", Mathematical Programming Study 22, 1984, 206-216.
65. "Sufficiency of exact penalty minimization", SIAM Journal on on Control and Optimization 23, 1985, 30-37.
66. "Simple computable bounds for solutions of linear complementarity problems and linear programs", Mathematical Programming Study 25, 1985, 1-12.
67. (with L. McLinden) "Simple bounds for solutions of monotone complementarity problems and convex programs", Mathematical Programming 32, 1985, 32-40.
68. "Some applications of penalty functions in mathematical programming", Lecture Notes in Mathematics No. 1190, "Optimization and Related Fields", R. Conti, E. De Giorgi and F. Giannessi, editors, Springer-Verlag, Berlin, 1986, 307-329.
69. (with T.-H. Shiau) "A variable-complexity norm maximization problem", SIAM Journal on Algebraic and Discrete Methods 7, 1986, 455-461.

70. "Computable numerical bounds for Lagrange multipliers of stationary points of nonconvex differentiable nonlinear programs", Operations Research Letters 4, 1985, 47-48.

71. (with T.-H. Shiau) "Lipschitz continuity of solutions of linear inequalities, programs and complementarity problems", SIAM Journal on Control and Optimization 25, 1987, 583-595.

72. (with T.-H. Shiau) "Error bounds for monotone linear complementarity problems", Mathematical Programming 36, 1986, 81-89.

73. (with R. De Leone): "Error bounds for strongly convex programs and (super)linearly convergent iterative schemes for the least 2-norm solution of linear programs", Applied Mathematics and Optimization, 17, 1988, 1-14.

74. (with R. De Leone): "Parallel successive overrelaxation methods for symmetric linear complementarity problems and linear programs", Journal of Optimization Theory and Applications 54, 1987, 437-446.

75. (with R. De Leone): "Parallel gradient projection successive overrelaxation for symmetric linear complementarity problems and linear programs", Annals of Operations Research 14, 1988, 41-59.

76. "A simple characterization of solution sets of convex programs", Operations Research Letters 7, 1988, 21-26.

77. "Least norm solution of non-monotone linear complementarity problems", in "Functional analysis, optimization and mathematical economics", L. J. Leifman, editor, Oxford University Press, New York 1990, 217-221.

78. (with R. De Leone): "Serial and parallel solution of large scale linear programs by augmented Lagrangian successive overrelaxation" in A. Kurzhanski, K. Neumann & D. Pallaschke (eds): "Optimization, parallel processing and applications", Lecture Notes in Economics and Mathematical Systems Volume 304, Springer-Verlag, Berlin, 1988, 103-124.

79. (with R. De Leone): "Asynchronous parallel successive overrelaxation for the symmetric linear complementarity problem", Mathematical Programming B 42, 1988, 347-362.

80. "Error bounds for nondegenerate monotone linear complementarity problems", Mathematical Programming B 48, 1990, 437-445.

81. (with R. De Leone & T.-H. Shiau): "Multi-sweep asynchronous parallel successive overrelaxation for the nonsymmetric linear complementarity problem", Annals of Operations Research 22, 1990, 43-54.

82. (with M. C. Ferris): "Finite perturbation of convex programs", Applied Mathematics and Optimization 23, 1991, 263-273.

83. (with W. H. Wolberg): "Multisurface method of pattern separation for medical diagnosis applied to breast cytology", Proceedings of the National Academy of Sciences U.S.A. 87, 1990, 9193-9196.

84. (with W. H. Wolberg & W. N. Street): "Computer-aided diagnosis of breast aspirates via expert systems", Analytical and Quantitative Cytology and Histology 12, 1990, 314-320.

85. (with M. C. Ferris): "Minimum principle sufficiency", Mathematical Programming B 57, 1992, 1-14.

86. (with R. Setiono & W. H. Wolberg): "Pattern recognition via linear programming: Theory and application to medical diagnosis", in: "Large-scale numerical optimization", Thomas F. Coleman and Yuying Li, editors, SIAM, Philadelphia 1990, 22-30.

87. (with W. H. Wolberg): "Computer-designed expert systems for breast cytology diagnosis", Analytical and Quantitative Cytology and Histology, 15, 1993, 67-74.

88. "Convergence of iterates of an inexact matrix splitting algorithm for the symmetric monotone linear complementarity problem", SIAM Journal on Optimization 1, 1991, 114-122.

89. (with K. P. Bennett): "Neural network training via linear programming", in P. M. Pardalos (Editor), "Advances in Optimization and Parallel Computing", North Holland, Amsterdam 1992, 56-67.
90. (with W. H. Wolberg): "Cancer diagnosis via linear programming", SIAM News 23(5), September 1990, pp. 1 & 18.
91. "Mathematical programming musings", in "History of mathematical programming", J. K. Lenstra, A. H. G. Rinnooy Kan and A. Schrijver, editors, North Holland, Amsterdam 1991, 107-113.
92. (with M. C. Ferris): "Parallel constraint distribution", SIAM Journal on Optimization 1, 1991, 487-500.
93. "Global error bounds for monotone affine variational inequality problems", Linear Algebra and Its Applications 174, 1992, 153-164.
94. (with K. P. Bennett): "Robust linear programming discrimination of two linearly inseparable sets", Optimization Methods and Software 1, 1992, 23-34.
95. (with M. C. Ferris): "Error bounds and strong upper semicontinuity for monotone affine variational inequalities", Annals of Operations Research, 47, 1993, 293-305.
96. (with M. V. Solodov): "Nonlinear complementarity as unconstrained and constrained minimization", Mathematical Programming, Series B, 62, 1993, 277-297.
97. (with K. P. Bennett): "Bilinear separation of two sets in n-space", Computational Optimization and Applications 2, 1993, 207-227.
98. (with W. N. Street & W. H. Wolberg): "Breast cytology diagnosis with digital image analysis", Analytical and Quantitative Cytology and Histology 15(6), 1993, 396-404.
99. (with Z.-Q. Luo, J. Ren & M. V. Solodov): "New error bounds for the linear complementarity problem", Mathematics of Operations Research 19(4), November 1994, 880-892.
100. (with K. P. Bennett): "Multicategory discrimination via linear programming", Optimization Methods and Software 3, 1994, 27-39.
101. "Mathematical programming in neural networks", ORSA Journal on Computing 5, 1993, 349-360.
102. (with W. N. Street & W. H. Wolberg): "Nuclear feature extraction for breast tumor diagnosis", in Proceedings of Meeting on "Biomedical image processing and biomedical visualization", San Jose, California, February 1-4, 1993, SPIE-The International Society for Optical Engineering, Bellingham, Washington, SPIE Volume 1905, 1993, 861-870.
103. "Parallel gradient distribution in unconstrained optimization", SIAM Journal on Control and Optimization 33(6), 1995, 1916-1925.
104. (with M. V. Solodov): "Serial and parallel backpropagation convergence via nonmonotone perturbed minimization", Optimization Methods and Software 4(2), 1994, 103-116.
105. (with J. Ren): "New improved bounds for the linear complementarity problem", Mathematical Programming 66, September 1994, 241-255.
106. (with K. P. Bennett): "Serial and parallel multicategory discrimination", SIAM Journal on Optimization, 4(4), November 1994, 722-734.
107. "Error bounds for inconsistent linear inequalities and programs", Operations Research Letters 15, May 1994, 187-192.
108. (with M. C. Ferris): "Parallel variable distribution", SIAM Journal on Optimization, 4(4), November 1994, 815-832.
109. "Misclassification minimization", Journal of Global Optimization 5(4), December 1994, 309-323.
110. (with Jong-Shi Pang): "The extended linear complementarity problem", SIAM Journal on Matrix Analysis and Applications 16, January 1995, 359-368.

111. (with Chunhui Chen): "Smoothing methods for convex inequalities and linear complementarity problems", Mathematical Programming 71, 1995, 51-69.

112. (with M. V. Solodov): "Backpropagation convergence via deterministic nonmonotone perturbed minimization". Mathematical Programming Technical Report 94-06, June 1994. "Advances in Neural Information Processing Systems -6-", (NIPS*93), J. D. Cowan, G. Tesauro and J. Alspector, editors, Morgan Kaufmann, San Francisco, CA, 1994, 383-390.

113. (with J. Ren): "New error bounds for the nonlinear complementarity problem", Communications on Applied Nonlinear Analysis 1, 1994, 49-56.

114. (with W. H. Wolberg and W. Nick Street): "Machine learning techniques to diagnose breast cancer from image-processed nuclear features of fine needle aspirates", Cancer Letters 77, 1994, 163-171.

115. "The linear complementarity problem as a separable bilinear program". Mathematical Programming Technical Report 94-09, July 1994. Journal of Global Optimization 6, 1995, 153-161.

116. (with W. Nick Street and W. H. Wolberg): "Breast cancer diagnosis and prognosis via linear programming". Mathematical Programming Technical Report 94-10, August 1994. Operations Research, 43(4), July-August 1995, 570-577.

117. (with Chunhui Chen): "A class of smoothing functions for nonlinear and mixed complementarity problems". Mathematical Programming Technical Report 94-11, August 1994. Computational Optimization and Applications 5, 1996, 97-138.

118. (with W. H. Wolberg and W. Nick Street): "Image analysis and machine learning applied to breast cancer diagnosis and prognosis", Analytical and Quantitative Cytology and Histology 17, 1995, 77-87.

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122. "Optimization in Machine Learning". Mathematical Programming Technical Report 95-01, January 1995. SIAG/OPT Views-and-News, No.6, Spring 1995, 3-7.

123. (with Chunhui Chen): "Hybrid misclassification minimization". Mathematical Programming Technical Report 95-05, February 1995. Advances in Computational Mathematics 5(2) 1996, 127-136.

124. (with W. Nick Street and W. H. Wolberg): "An Inductive Learning Approach to Prognostic Prediction", in "Machine Learning: Proceedings of the Twelfth International Conference", A. Prieditis and S. Russell (editors), Morgan Kaufmann, San Francisco 1995, 522-530.

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133. "Mathematical programming in data mining". Mathematical Programming Technical Report 96-05. Journal of Data Mining and Knowledge Discovery 1(2), 1997, 183-201.

134. (with J.-S. Pang):"Exact penalty functions for mathematical programs with linear complementarity constraints". Mathematical Programming Technical Report 96-06, August 1996. Optimization 42, 1997, 1-8.

135. (with M. V. Solodov):"A linearly convergent derivative-free descent method for strongly monotone complementarity problems", Computer Sciences Department, Mathematical Programming Technical Report 96-07, October 1996, Computational Optimization and Applications 14, 1999, 5-16.

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142. (with W. H. Wolberg & W. N. Street):"Computer-derived nuclear features compared with axillary lymph node status for breast carcinoma prognosis", Cancer Cytopathology 81, 1997, 172-179.

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144. (with P. S. Bradley):"Parsimonious side propagation". Mathematical Programming Technical Report 97-11, October 1997. ICASSP98: IEEE International Conference on Acoustics, Speech and Signal Processing, Seattle May 12-15, 1998, Volume 3, 1873-1876.

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148. (with P. S. Bradley):"Massive data discrimination via linear support vector machines", Mathematical Programming Technical Report 98-05, May 1998. Optimization Methods and Software 13(1), 2000, 1-10.

149. (with P. S. Bradley):"k-Plane Clustering", Mathematical Programming Technical Report 98-08, August 1998. Journal of Global Optimization 16, 2000, 23-32.

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151. (with D. R. Musicant):"Successive Overrelaxation for Support Vector Machines", Mathematical Programming Technical Report 98-18, November 1998, IEEE Transactions on Neural Networks 10, 1999, 1032-1037.

152. (with D. R. Musicant):"Data Discrimination via Nonlinear Generalized Support Vector Machines", Mathematical Programming Technical Report 99-03, March 1999, in "Complementarity: Algorithms, Applications and Extensions", M. C. Ferris, O. L. Mangasarian and J.-S. Pang, editors, Kluwer Academic Publishers, 2001, Dordrecht, 233-251.

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