MAPL699, Applied Mathematics Seminar Spring 2001, Optimization and Equilibrium Problems Selected References

Surveys

- M. C. Ferris and J. S. Pang, *Complementarity and Variational Problems*, SIAM, Philadelpha, 1997.
- M. C. Ferris and J. S. Pang, "Engineering and economic applications of complementarity problems," *SIAM Review*, vol. 39, No.4, pp. 669-713, December 1997.
- P. T. Harker and J. S. Pang, "Finite-dimensional variational inequality and nonlinear complementarity problems: a survey of theory, algorithms, and applications," *Mathematical Programming*, 48, pp. 161-220, 1990.

Theory of Optimization and Equilibrium Problems

- M. S. Bazaraa, H. D. Sherali, C. M. Shetty, *Nonlinear Programming Theory and Algorithms*, John Wiley & Sons, Inc., New York, 1979, ISBN 0-471-55793-5
- F. H. Clarke, *Optimization and Nonsmooth Analysis*, SIAM, Philadelphia, 1990, ISBN 0-89871-256-4. (part of the *Classics in Applied Mathematics* Series by Society for Industrial and Applied Mathematics)
- R. W. Cottle, J. S. Pang, and R. E. Stone, *The Linear Complementarity Problem*, Academic Press, Inc., San Diego, 1992, ISBN 0-12-192350-9.
- B. C. Eaves, "On the basic theorem of complementarity", *Mathematical Programming*, 1, 68-75, 1971.
- A. V. Fiacco, G. P. McCormick, *Nonlinear Programming Sequential Unconstrained Minimization Techniques*, SIAM, Philadelphia, 1990, ISBN 0-89871-254-8.
- R. Fletcher, *Practical Methods of Optimization*, John Wiley & Sons, Inc., New York, 1987, ISBN 0-471-91547-5.
- P. T. Harker, *Lectures on Computation of Equilibria with Equation-Based Methods*, CORE Lecture Series, Université catholique de Louvain, Louvain-la-Neuve, Belgium, 1993.

- D. G. Luenberger, *Linear and Nonlinear Programming*, Addison-Wesley Publishing Company, Menlo Park, CA, 1984, ISBN 0-201-15794-2.
- Z. Q. Luo, J. S. Pang, D. Ralph, *Mathematical Programs with Equilibrium Constraints*, Cambridge University Press, New York, 1996, ISBN 0-521-57290-8.
- O. L. Mangasarian, *Nonlinear Programming*, SIAM, Philadelphia, 1994, ISBN 0-89871-341-2.
- S. G. Nash and A. Sofer, *Linear and Nonlinear Programming*, The McGraw-Hill Companies, Inc., New York, 1996, ISBN 0-07-046065-5.
- J. M. Ortega and W. C. Rheinboldt, *Iterative Solution of Nonlinear Equations in Several Variables*, Academic Press, Inc., San Diego, 1970, ISBN 0-12-528550-7.

Energy Equilibrium Modeling and Algorithms

- B. H. Ahn, *Computation of Market Equilibria for Policy Analysis*, Garland Publishing, Inc., New York, 1979.
- B. H. Ahn, and W. W. Hogan, "On convergence of the PIES algorithm for computing equilibria," *Operations Research*, 30, 281-300, 1982.
- S. A. Gabriel and A. S. Kydes, "A nonlinear complementarity approach for the National Energy Modeling System," preprint MCS-P504-0395, Mathematics and Computer Science Division, Argonne National Laboratory, March 1995.
- S. A. Gabriel, A. S. Kydes, P. Whitman, "The National Energy Modeling System: a large-scale energy-economic equilibrium model,", accepted for publication in *Operations Research*, December, 1998.
- W. W. Hogan, "Energy policy models for project independence," *Computation and Operations Research*, 2, 251-271, 1975.

Traffic Equilibrium Modeling and Algorithms

- H. Z. Aashtiani and T. Magnanti, "Equilibria on a Congested Transportation Network," *SIAM Journal on Algebraic and Discrete Methods*, 2, 213-226, 1981.
- D. Bernstein and S. A. Gabriel, "Solving the nonadditive traffic equilibrium problem," in *Lecture Notes in Economics and Mathematical Systems Network Optimization*, P. M. Pardalos, D. W. Hearn, W. W. Hager, eds., Springer, pp. 72-102, 1997.

- D. Bernstein and T. E. Smith, "Network Equilibria with Lower Semicontinuous Costs: With an Application to Congestion Pricing," *Transportation Science*, 28, 221-235, 1984.
- D. P. Bertsekas and E. M. Gafni, "Projection Methods for Variational Inequalities with Applications to the Traffic Assignment Problem," *Mathematical Programming Study*, 17, 139-159, 1982.
- S. C. Dafermos, "Traffic Equilibrium and Variational Inequalities," *Transportation Science*, 14, 42-54, 1980.
- S. C. Dafermos, "The General Multimodal Network Equilibrium Problem with Elastic Demands," *Networks*, 12, 57-72, 1982.
- C. Fisk and D. Boyce, "Alternative Variational Inequality Formulations of the Equilibrium-Travel Choice Problem," *Transportation Science*, 17, 454-463, 1983.
- M. Florian, "Nonlinear Cost Network Models in Transportation Analysis," *Mathematical Programming Study*, 26, 167-196 (1986).
- M. Florian and H. Spiess, "The Convergence of Diagonalization Algorithms for Network Equilibrium Problems," *Transportation Research B*, 16B, 447-483, 1982.
- T. L. Friesz, "Transportation Network Equilibrium, Design, and Aggregation: Key Developments and Research Opportunities," *Transportation Research A*, 19A, 413-427 1985.
- S. A. Gabriel and D. Bernstein, "The traffic equilibrium problem with nonadditive costs," *Transportation Science*, 31, pp. 337-348, 1997.
- T. Larsson, and M. Patricksson, "Simplicial Decomposition with Disaggregated Representation for the Traffic Assignment Problem," *Transportation Science*, 26, 4-17 1992.
- S. Lawphonpanich and D. W. Hearn, "Simplicial Decomposition of the Asymmetric Traffic Assignment Problem," *Transportation Research B*, 18B, 123-133, 1984.
- P. Marcotte and J. Guélat, "Adaptation of a Modified Newton Method for Solving the Asymmetric Traffic Equilibrium Problem," *Transportation Science*, 22, 112-124, 1988.
- P. Marcotte and S. Nguyen (eds.), *Equilibrium and Advanced Transportation Modelling* Kluwer Academic Publishers, Norwell, MA 1998, ISBN 0-7923-8162-9.
- A. Nagurney, "Comparative Tests of Multimodal Traffic Equilibrium Methods," *Transportation Research B*, 18B, 469-485, 1984.

- S. Nguyen, "A Unified Approach to Equilibrium methods for Traffic Assignment," in M. Florian (ed.) *Traffic Equilibrium Methods*, Springer-Verlag, 1974.
- J. S. Pang and C. S. Yu, "Linearized Simplicial Decomposition Methods for Computing Traffic Equlibria on Networks," *Networks*, 14, 427-438, 1984.
- M. J. Smith, "The Existence, Uniqueness and Stability of Traffic Equilibria," *Transportation Research B*, 13B, 295-304, 1979.
- M.J. Smith, "The Existence and Calculation of Traffic Equilibria," *Transportation Research B*, 17B, 291-303, 1983.

General Purpose Equilibrium Algorithms

- S. C. Billups and M. C. Ferris, "QPCOMP: A quadratic programming based sovler for mixed complementarity problems," *Mathematical Programming*, 76, 533-562, 1997.
- B. Chen and P. T. Harker, "Smooth approximations to nonlinear complementarity problems," *SIAM Journal on Optimization*, 7, No. 2, 403-420, 1997.
- B. Chen and X. Chen, "A global and local superlinear continuation-smoothing method for P₀ and R₀ and montone NCP," *SIAM Journal on Optimization*, to appear, 1999.
- C.H. Chen and O.L. Mangasarian, "A class of smoothing functions for nonlinear and mixed complementarity problems," *Computational Optimization and Applications*, vol. 5, pp. 97-138, 1996.
- X. Chen, L. Qi, and D. Sun, "Global and superlinear convergence of the smoothing Newton method and its application to general box constrained variational inequalities," *Mathematics of Computation*, 67, 519-540, 1998.
- X. Chen and Y. Ye, "On homotopy-smoothing methods for variational inequalities," Technical Report AMR 96/39, School of Mathematics, The University of New South Wales, Sydney, Australia, 1996.
- T. De Luca, F. Facchinei, and C. Kanzow, "A semismooth equation approach to the solution of nonlinear complementarity problems," *Mathematical Programming*, 75, 407-439, 1996.
- S. P. Dirkse and M. C. Ferris, "The PATH solver: a non-monotone stabilization scheme for mixed complementarity problems," *Optimization Methods & Software*, 5, 123-156, 1995.

- F. Facchinei and C. Kanzow, "A nonsmooth inexact Newton method for the solution of large-scale nonlinear complementarity problems," *Mathematical Programming*, 76, 493-512, 1997.
- F. Facchinei and J. Soares, "A new merit function for nonlinear complementarity problems and a related algorithm, *SIAM Journal on Optimization*, 7, No. 1, 225-247, 1997.
- A. Fischer, "An NCP-function and its use for the solution of complementarity problems," in *Recent Advances in Nonsmooth Optimization*, D. Z. Due, L. Qi and R. S. Womersley (Eds.), World Scientific Publishers, 88-105, 1995.
- S. A. Gabriel, "An NE/SQP method for the bounded nonlinear complementarity problem," *Journal for Optimization Theory and Applications*, 97, pp. 493-506, 1998.
- S. A. Gabriel, "A hybrid smoothing method for the mixed nonlinear complementarity problem", *Computational Optimization and Applications*, 9, pp. 153-173, 1998.
- S. A. Gabriel and J. J. More', "Smoothing of mixed complementarity problems," in *International Conference on Complementarity Problems*, The Johns Hopkins University, Baltimore, Maryland, pp. 105-116, 1995.
- S. A. Gabriel and J. S. Pang, "An inexact NE/SQP method for solving the nonlinear complementarity problem," *Computational Optimization and Applications*, 1, pp. 67-91, 1992.
- S. A. Gabriel and J. S. Pang, "A trust region method for constrained nonsmooth equations," in *Large-Scale Optimization: State of the Art*, edited by W.W. Hager, D.W. Hearn, and P. Pardalos, Kluwer Academic Publishers, pp. 159-186, 1994.
- P. T. Harker and B. Xiao, "Newton's method for the nonlinear complementarity problem: a B-differentiable equation problem, "*Mathematical Programming*, 48, 339-357, 1990.
- H. Jiang, M. Fukushima, L. Qi, and D. Sun, "A trust region method for solving generalized complementarity problems," *SIAM Journal on Optimization*, 8, No. 1, 140-157, 1998.
- C. Kanzow and H. Pieper, "Jacobian smoothing methods for nonlinear complementarity problems," *SIAM Journal on Optimization*, 9, No. 2, 342-373, 1999.
- M. Kojima, N. Megiddo, and S. Mizuno, "A general framework of continuation methods for complementarity problems," *Mathematics of Operations Research*, 18, 945-963, 1993.

- M. Kojima, N. Megiddo, and T. Noma, "Homotopy continuation methods for nonlinear complementarity problems," *Mathematics of Operations Research*, 16, 754-774, 1991.
- J. M. Martinez and L. Qi, "Inexact Newton methods for solving nonsmooth equations," *Journal of Computational and Applied Math*, 60, 127-145, 1995.
- R.D.C. Monteiro, J. S. Pang, and T. Wang, "A positive algorithm for the nonlinear complementarity problem," *SIAM Journal on Optimization*, 5, 129-148, 1995.
- J. S. Pang, "Newton's method for B-differentiable equations," *Mathematics of Operations Research*, 15, 311-341,1990.
- J. S. Pang and S. A. Gabriel, "NE/SQP: a robust algorithm for the nonlinear complementarity problem," *Mathematical Programming*, 60, pp. 295-337, 1993.
- D. Ralph, "Global convergence of damped Newton's method for nonsmooth equations via the path search," *Mathematics of Operations Research*, 19, 352-389, 1994.
- H. Sellami and S.M. Robinson, "Homotopies based on nonsmooth equations for solving nonlinear variational inequalities," In G. Di Pillo and F. Giannessi, editors, *Nonlinear Optimization and Applications*, pp. 327-343, Plenum Press, New York, 1996.
- P. Tseng, "Global linear convergence of a path-following algorithm for some monotone variational inequality problems, "Journal of Optimization Theory and Applications, 75, 265-279, 1992.
- P. Tseng, "An infeasible path-following method for monotone complementarity problems," *SIAM Journal on Optimization*, 7, No.2, 386-402, 1997.
- B. Xiao and P. T. Harker, "A nonsmooth Newton method for variational inequalities, I: theory," *Mathematical Programming*, 65, pp. 151-194, 1994.
- B. Xiao and P. T. Harker, "A nonsmooth Newton method for variational inequalities, II: numerical results," *Mathematical Programming*, 65, pp. 195-216, 1994.
- S. J. Wright and D. Ralph, "A superlinear infeasible-interior-point algorithm for monotone complementarity problems," Mathematics of Operations Research, 21, 815-838, 1996.