References

[1] E. Althaus, G. Călinescu, I.I. Măndoiu, S. Prasad, N. Tchervenski, and A. Zelikovsky. Power efficient range assignment in ad-hoc wireless networks. In *Proceedings of the IEEE WCNC*, pages 1889–1894, 2003.

[2] E. Althaus, T. Polzin, and S. Vahdati Daneshmand. Improving linear programming approaches for the Steiner tree problem. Technical report, 2003.

[3] K. Altinkemer, F.S. Salman, and P. Bellur. Solving the minimum energy broadcasting problem in ad hoc wireless networks by integer programming. In *Proceedings of the INOC*, pages B2.635–B2.642, 2005.

[4] E. Amaldi, P. Belotti, A. Capone, and F. Malucelli. Optimizing base station location and configuration in umts networks. *Annals of Operations Research*, to appear.

[5] K. Andersen and Y. Pochet. Coefficient strengthening: a tool for formulating mixed integer programs. *Submitted*.

[6] A. Balakrishnan and N.R. Patel. Problem reduction methods and a tree generation algorithm for the Steiner network problems. *Networks*, 17:65–85, 1987.

[7] E. Balas and S.M. NG. On the set covering polytope: I all the facet with coefficients in $\{0, 1, 2\}$. *Mathematical Programming*, 43:57–69, 1989.

[8] E. Balas and S.M. NG. On the set covering polytope: II lifting the facets in $\{0, 1, 2\}$. *Mathematical Programming*, 45:1–20, 1989.

[9] J.E. Beasley. An SST-Based algorithm for the Steiner tree problems in graph. *Networks*, 19:1–16, 1989.

[10] D. Bertsimas and J.N. Tsitsiklis. *Introduction to Linear Optimization.* Athena Scientific, 1997.

[11] D. Blough, M. Leoncini, G. Resta, and P. Santi. On the symmetric range assignment problem in wireless ad hoc networks. In *Proceedings of the 2nd IFIP International Conference on Theoretical Computer Science*, pages 71–82, 2002.

[12] S.A. Borbash and E.H. Jennings. Distributed topology control algorithm for multihoc wireless networks. In *Proceedings of IJCNN*, 2002.

[13] M. Cagalj, J.-P. Hubaux, and C. Enz. Minimum-Energy Broadcast in all-wireless networks: NP-completeness and distribution issues. In *Proceedings of the MOBICOM*, 2002.

[14] I. Caragiannis, C. Kaklamanis, and P. Kanellopoulos. Energy-efficient wireless network design. *Theory of computing system*, 39:593–617, 2006.

[15] J. Cargigny, D. Simplot, and I. Stojmenović. Localized minimum-energy broadcasting in ad-hoc networks. In *Proceedings of the IEEE INFOCOM*, 2003.

[16] S. Chopra, E. Gorres, and M.R. Rao. Solving the Steiner tree problem on a graph using branch and cut. *ORSA Journal on Computing*, 4:320–335, 1992.

[17] T. Christof and A. Löbel. Porta. Available on-line at the web address *http : //www.zib.de/Optimization/Software/Porta/*.

[18] T. Chu and I. Nikolaidis. Energy efficient broadcast in modile ad hoc networks. In *Proceedings of AD-HOC Networks and Wireless*, 2002.

[19] V. Chvátal. Edmonds polytope and a hierarchy of combinatorial problems. *Discrete Mathematics*, 4:305–337, 1973.

[20] A. Clementi, P. Crescenzi, P. Penna, G. Rossi, and P. Vocca. On the complexity of computing minimum energy consumption broadcast subgraphs. In *Symposium on Theoretical Aspects of Computer Science*, pages 121–131, 2001.

[21] A. Clementi, P. Penna, and R. Silvestri. Hardness results for the power range assignment problem in packet radio networks. *Lectures Notes on Computer Science*, 1671:195–208, 1999.

[22] G. Cornuéjols and A. Sassano. On the 0, 1 facets of the set covering polytope. *Mathematical Programming*, 43:45–55, 1989.

[23] A.K. Das, R.J. Marks II, M. El-Sharkawi, P. Arabshahi, and A. Gray. The minimum power broadcast problem in wireless networks: an ant colony system approach. In *Proceedings of the IEEE Workshop on Wireless Communications and Networking*, 2002.

[24] A.K. Das, R.J. Marks, M. El-Sharkawi, P. Arabshani, and A. Gray. Optimization methods for minimum power bidirectional topology construction in wireless networks with sectored antennas. *Submitted*.

[25] A.K. Das, R.J. Marks, M. El-Sharkawi, P. Arabshani, and A. Gray. Minimum power broadcast trees for wireless networks: integer programming formulations. In *Proceedings of the IEEE INFOCOM*, 2003.

[26] M. Desrochers and G. Laporte. Improvements and extensions to the Miller-Tuckler-Zemlin subtour elimination constraints. *Operation Research Letters*, 10:27–36, 1991.

[27] E.W. Dijkstra. A note on two problems in connexion with graphs. *Numerische Mathematik*, 1:269–271, 1959.

[28] J.J. Dongarra. Performance of various computers using standard linear algebra software in a fortran environment. Technical Report CS-89-85, University of Tennessee, 2003.

[29] D.Z. Du, B. Lu, H.Ngo, and P.M. Pardalos. *Steiner tree problems*, pages 227–290. Kluwer Academic Publishers, 2001.

[30] F. Eisenbrand. On the membership problem for the elementary closure of a polyhedron. *Combinatorica*, 19:297–300, 1999.

[31] M. Fischetti and A. Lodi. Optimizing over the first Chvátal closure. *Submitted.*

[32] M.L. Fisher. The lagrangian relaxation method for solving integer programming problems. *Management Science*, 27(1):1–18, 1981.

[33] L.R. Ford and D.R. Fulkerson. *Flows in Networks*. Princeton University Press, 1962.

[34] K. Fukuda. cdd. Available on-line at the web address $http://www.ifor.math.ethz.ch/ \sim fukuda/cdd\_home/cdd.html$.

[35] R.E. Gomory. Outline of an algorithm for the integer solutions to linear programs. *Bulletin of the American Mathematical Society*, 64:275–278, 1958.

[36] S. Guo and O. Yang. Minimum-energy broadcast routing in wireless multi-hop networks. In *IEEE PCC*, 2003.

[37] S. Guo and O. Yang. QoS-aware minimum energy multicast tree construction in wireless ad hoc networks. *Ad Hoc Networks*, 2:217–229, 2004.

[38] G.Y. Handler and I. Zang. A dual algorithm for the constrained shortest path problem. *Networks*, 10:293–310, 1980.

[39] M. Haouari and P. Dejax. Plus court chemin avec dapplication aux problèmes de tournées. *RAIRO*, 31:117–131, 1997.

[40] Z. Huang, C.-C. Shen, C. Srisathapornphat, and C. Jaikaeo. Topology control for ad hoc networks with directional antennas. In *Proceedings of the Eleventh International Conference on Computer Communications and Networks*, 2002.

[41] F.K. Hwang, D.S. Richards, and P. Winter. The Steiner tree problem. *Annals of Discrete Mathematics*, 53, 1992.

[42] R.J. Marks II, A.K. Das, M. El-Sharkawi, P. Arabshani, and A. Gray. Minimum power broadcast trees for wireless networks: optimizing using the viability lemma. In *Proceedings of the IEEE ISCAS*, 2002.

[43] X. Jia, D. Li, and D. Du. QoS topology control in ad hoc wireless networks. In *Proceedings of the INFOCOM*, 2004.

[44] H.C. Joksch. The shortest route with constraints. *Journal of Mathematical Analysis and Applications*, 14:191–197, 1966.

[45] Richard M. Karp. Reducibility among combinatorial problems. In *Complexity of Computer Computations*, pages 85–103. Plenum, 1972.

[46] L. Kirousis, E. Kranakis, D. Krizanc, and A. Pelc. Power consumption in packet radio networks. *Theoretical Computer Science*, 243:289–305, 2000.

[47] T. Koch and A. Martin. Solving Steiner tree problems in graph to optimlity. *Networks*, 32:207–232, 1998.

[48] T. Koch, A. Martin, and S. Voβ. SteinLib. *http : //elib.zib.de/steinlib.*

[49] V.P. Kompella, J.C. Pasquale, and G.C. Polyzos. Multicast routing for multimedia communication. *IEEE ACM*, 1(3):289–292, 1993.

[50] Z. Kun, W. Heng, and L. Feng-Yu. Distributed multicast routing for delay and delay variation-bounded Steiner tree using simulated annealing. *Computer Communications*, 28:1356–1370, 2005.

[51] V. Leggieri, M. Haouari, S. Layeb, and C. Triki. Delay-constrained Steiner tree problem. *Working paper*, 2007.

[52] V. Leggieri, P. Nobili, and C. Triki. Minimum power multicasting problem in wireless networks. *Submitted.*

[53] J. Leino. Optimal multicast routing in ad hoc networks. Technical report, 2002.

[54] F. Li, S. Mannor, and A. Lippman. Probabilistic optimization for energy-efficient broadcast in all-wireless networks. In *Proceedings of the 2005 Conference on Information Sciences and Systems, The Johns Hopkins University*, 2005.

[55] W. Liang. Constructing minimum-energy broadcast trees in wireless ad hoc networks. In *Proceedings of MOBIHOC*, pages 112–122, 2002.

[56] E. Lloyd, R. Liu, M. Marathe, R. Ramanathan, and S. Ravi. Algorithmic aspects of topology control problems for ad hoc networks. In *Proceedings of the ACS MobiHoc*, pages 123–134, 2002.

[57] T.L. Magnanti and L. Wolsey. *Optimal trees* , volume 7, pages 503–615. North-Holland, 1995.

[58] C.E. Miller, A.W. Tucker, and R.A.Zemlin. Integer programming formulation of the Traveling Salesman problems. *J. ACM*, 7:326–329, 1960.

[59] M. Minoux. Plus court chemin avec contraintes: algorithmes et applications. *Annales des télécommunications*, 30:383–394, 1975.

[60] R. Montemanni and L.M. Gambardella. Exact algorithms for the minimum power symmetric connectivity problem in wireless networks. *Computers and Operations Research*, 31(10):1667–1680, 2004.

[61] R. Montemanni, L.M. Gambardella, and A.K. Das. The minimum power broadcast tree problem in wireless networks: a simulated annealing approach. In *Proceedings of the IEEE WCNC*, 2005.

[62] R. Montemanni, L.M. Gambardella, and A.K. Das. *Models and algorithms for the MPSCP: an overview*, pages 133–146. Auerbach Publications, 2006.

[63] R. Montemanni, V. Leggieri, and C. Triki. Mixed integer formulations for the probabilitic minimum energy broadcast in wireless networks. *Submitted*.

[64] G.L. Nemhauser and L.A. Wolsey. *Integer and Combinatorial Optimization*. Wiley, 1988.

[65] C. Noronha and F. Tobagi. Optimum routing of multicast streams. In *INFOCOM*, pages 865–873, 1994.

[66] C.A.S. Oliveira and P.M. Pardalos. A survey of combinatorial optimization problems in multicast routing. *Computers & Operations Research*, 32:1953–1981, 2005.

[67] M. Padberg and L. Wolsey. Trees and cuts. *Annals of Discrete Mathematics*, 17:511–517, 2003.

[68] C.H. Papadimitriou and K. Steiglitz. *Combinatorial optimization, Algorithms and Complexity.* Dover, 1998.

[69] T. Polzin and S. Vahdati Daneshmand. A comparison of Steiner tree relaxations. *Discrete Applied Mathematics*, 112:241–261, 2001.

[70] R.C. Prim. Shortest connection networks and some generalizations. *Be14.32 13/04/2007ll System Technical Journal*, 36:1389–1401, 1957.

[71] R. Ramanathan and R. Rosales-Hain. Topology control of multihop wireless networks using transmit power adjustment. In *Proceedings of the IEEE Infocom*, pages 404–413, 2000.

[72] T. Rappaport. *Wireless Communications: Principles and Practices.* Prentice Hall, 1996.

[73] F. Rossi, A. Sassano, and S. Smriglio. Models and algorithms for terrestrial digital broadcasting. *Annals of Operations Research*, 3(107):267–283, 2001.

[74] A. Ruszczyński and A. Shapiro. *Stochastic Programming.* Elsevier, 2003.

[75] H.F. Salama, D.S. Reeves, and Y. Viniotis. The delay-constrained minimum spanning tree problem. *ISCC*, pages 699–704, 1997.

[76] A. Sassano. On the facial structure of the set covering polytope. *Mathematical Programming*, 44:181–202, 1989.

[77] A. Sassano. *Modelli e algoritmi della ricerca operativa.* FrancoAngeli, 1999.

[78] S. Singh, C. Raghavendra, and J. Stepanek. Power-aware broadcasting in mobile ad hoc networks. In *Proceedings of the IEEE PIMRC*, 1999.

[79] R. Sriram, G. Manimaran, and C. Siva Ram Murthy. Algorithms for delay-constrained low-cost multicast tree construction. *Computer Communications*, 21(18):1693–1706, 1998.

[80] S.Y. Tseng, Y.M. Huang, and C.C. Lin. Genetic algorithm for delay- and degree-constrained multimedia broadcasting on overlay networks. *Computer Communications*, 29:3625–3632, 2006.

[81] E. Uchoa, M. Poggi de Aragao, and C.C. Ribeiro. Preprocessing Steiner problems from VLSI layout. Technical report, 1999.

[82] P.-J. Wan, G. Călinescu, X.-Y. Li, and O. Frieder. Minimum energy broadcast routing in static ad hoc wireless networks. In *Proceedings of the IEEE Infocom*, pages 1162–1171, 2001.

[83] R. Wattenhofer, L. Li, P. Bahl, and Y.M. Wang. Distributed topology control for power efficient operation in multihop wireless ad hoc networks. In *Proceedings of the Infocom*, pages 1388–1397, 2001.

[84] J. Wieselthier, G. Nguyen, and A. Ephremides. On the construction of energy-efficient broadcast and multicast trees in wireless networks. In *Proceedings of the IEEE INFOCOM*, pages 585–594, 2000.

[85] J.E. Wieselthier, G. Nguyen, and A. Ephremides. Algorithms for energy-efficient multicasting in static ad hoc networks. *Mobile Networks and Application*, 6:251–263, 2001.

[86] L.A. Wolsey. *Integer Programming*. Wiley-Interscience, 1998.

[87] R.T. Wong. A dual ascent approach for Steiner tree problems on a directed graph. *Mathematical programming*, 28:271–287, 1984.

[88] D. Yuan. An integer programming approach for the minimum-energy broadcast problem in wireless networks. In *Proceedings of the INOC*, pages B2.643–B2.650, 2005.

[89] Q. Zhu, M. Parsa, and J.J. Garcia-Luna-Aceves. A source-based algorithm for the delay-constrained minimum cost multicasting. In *INFOCOM*, pages 377–385, 1995.