

References

- E. Aarts and J. K. Lenstra (eds.). *Local Search in Combinatorial Optimization*. Wiley, 1997.
- R. K. Ahuja, T. L. Magnanti, and J. B. Orlin. *Network Flows: Theory, Algorithms, and Applications*. Prentice Hall, 1993.
- N. Alon and J. Spencer. *The Probabilistic Method* (2nd edition). Wiley, 2000.
- M. Anderberg. *Cluster Analysis for Applications*. Academic Press, 1973.
- E. Anshelevich, A. Dasgupta, J. Kleinberg, É. Tardos, T. Wexler, and T. Roughgarden. The price of stability for network design with fair cost allocation. *Proc. 45th IEEE Symposium on Foundations of Computer Science*, pp. 295–304, 2004.
- K. Appel and W. Haken. The solution of the four-color-map problem. *Scientific American*, 237:4(1977), 108–121.
- S. Arora and C. Lund. Hardness of approximations. In *Approximation Algorithms for NP-Hard Problems*, edited by D. S. Hochbaum. PWS Publishing, 1996.
- B. Awerbuch, Y. Azar, and S. Plotkin. Throughput-competitive online routing, *Proc. 34th IEEE Symposium on Foundations of Computer Science*, pp. 32–40, 1993.
- R. Bar-Yehuda and S. Even. A linear-time approximation algorithm for the weighted vertex cover problem. *J. Algorithms* 2 (1981), 198–203.
- A.-L. Barabasi. *Linked: The New Science of Networks*. Perseus, 2002.
- M. Beckmann, C. B. McGuire, and C. B. Winsten. *Studies in the Economics of Transportation*. Yale University Press, 1956.
- L. Belady. A study of replacement algorithms for virtual storage computers. *IBM Systems Journal* 5 (1966), 78–101.
- T. C. Bell, J. G. Cleary, and I. H. Witten. *Text Compression*. Prentice Hall, 1990.
- R. E. Bellman. *Dynamic Programming*. Princeton University Press, 1957.

- R. Bellman. On a routing problem. *Quarterly of Applied Mathematics* 16 (1958), 87–90.
- R. Bellman. On the approximation of curves by line segments using dynamic programming. *Communications of the ACM*, 4:6 (June 1961), 284.
- M. de Berg, M. van Kreveld, M. Overmars, and O. Schwarzkopf. *Computational Geometry: Algorithms and Applications*. Springer-Verlag, 1997.
- C. Berge. *Graphs and Hypergraphs*. North-Holland Mathematical Library, 1976.
- E. R. Berlekamp, J. H. Conway, and R. K. Guy. *Winning Ways for Your Mathematical Plays*. Academic Press, 1982.
- M. Bern and D. Eppstein. Approximation algorithms for geometric problems. In *Approximation Algorithms for NP-Hard Problems*, edited by D. S. Hochbaum. PWS Publishing, 1996.
- D. Bertsekas and R. Gallager. *Data Networks*. Prentice Hall, 1992.
- B. Bollobas. *Modern Graph Theory*. Springer-Verlag, 1998.
- A. Borodin and R. El-Yaniv. *Online Computation and Competitive Analysis*. Cambridge University Press, 1998.
- A. Borodin, M. N. Nielsen, and C. Rackoff. (Incremental) priority algorithms. *Proc. 13th Annual ACM-SIAM Symposium on Discrete Algorithms*, pp. 752–761, 2002.
- Y. Boykov, O. Veksler, and R. Zabih. Fast approximate energy minimization via graph cuts. *International Conference on Computer Vision*, pp. 377–384, 1999.
- L. J. Carter and M. L. Wegman. Universal classes of hash functions. *J. Computer and System Sciences* 18:2 (1979), 143–154.
- B. V. Cherkassky, A. V. Goldberg, and T. Radzik. Shortest paths algorithms: Theory and experimental evaluation. *Proc. 5th ACM-SIAM Symposium on Discrete Algorithms*, pp. 516–525, 1994.
- H. Chernoff. A measure of asymptotic efficiency for tests of a hypothesis based on the sum of observations. *Annals of Mathematical Statistics*, 23 (1952), 493–509.
- L. P. Chew. Building Voronoi diagrams for convex polygons in linear expected time. Technical Report, Dept. of Math and Computer Science, Dartmouth College, Hanover, NH, 1985.
- Y. J. Chu and T. H. Liu. On the shortest arborescence of a directed graph. *Sci. Sinica* 14 (1965), 1396–1400.
- S.-T. Chuang, A. Goel, N. McKeown, and B. Prabhakar. Matching output queueing with a combined input output queued switch. *IEEE J. on Selected Areas in Communications*, 17:6 (1999), 1030–1039.
- V. Chvatal. A greedy heuristic for the set covering problem. *Mathematics of Operations Research*, 4 (1979), 233–235.

- S. A. Cook. The complexity of theorem proving procedures. *Proc. 3rd ACM Symp. on Theory of Computing*, pp. 151–158. 1971.
- W. J. Cook, W. H. Cunningham, W. R. Pulleyblank, and A. Schrijver. *Combinatorial Optimization*. Wiley, 1998.
- T. Cover and J. Thomas. *Elements of Information Theory*. Wiley, 1991.
- R. Diestel, K. Yu. Gorbunov, T.R. Jensen, and C. Thomassen. Highly connected sets and the excluded grid theorem. *J. Combinatorial Theory, Series B* 75(1999), 61–73.
- R. Diestel. *Graph Theory* (2nd edition). Springer-Verlag, 2000.
- E. W. Dijkstra. A note on two problems in connexion with graphs. *Numerische Matematik*, 1 (1959), 269–271.
- E. A. Dinitz. Algorithm for solution of a problem of maximum flow in networks with power estimation. *Soviet Mathematics Doklady*, 11(1970), 1277–1280.
- R. Downey and M. Fellows. *Parametrized Complexity*. Springer-Verlag, 1999.
- Z. Drezner (ed.). Facility location. Springer-Verlag, 1995.
- R. Duda, P. Hart, and D. Stork. *Pattern Classification* (2nd edition). Wiley, 2001.
- M. E. Dyer and A. M. Frieze. A simple heuristic for the p -centre problem. *Operations Research Letters*, 3 (1985), 285–288.
- J. Edmonds. Minimum partition of a matroid into independent subsets. *J. Research of the National Bureau of Standards B*, 69 (1965), 67–72.
- J. Edmonds. Optimum branchings. *J. Research of the National Bureau of Standards*, 71B (1967), 233–240.
- J. Edmonds. Matroids and the Greedy Algorithm. *Math. Programming* 1 (1971), 127–136.
- J. Edmonds and R. M. Karp. Theoretical improvements in algorithmic efficiency for network flow problems. *Journal of the ACM* 19:2(1972), 248–264.
- L. Euler. Solutio problematis ad geometriam situs pertinentis. *Commentarii Academiae Scientiarum Imperialis Petropolitanae* 8 (1736), 128–140.
- R. M. Fano. *Transmission of Information*. M.I.T. Press, 1949.
- W. Feller. *An Introduction to Probability Theory and Its Applications*, Vol. 1. Wiley, 1957.
- A. Fiat, R. M. Karp, M. Luby, L. A. McGeoch, D. D. Sleator, and N. E. Young. Competitive paging algorithms. *J. Algorithms* 12 (1991), 685–699.
- R. W. Floyd. Algorithm 245 (TreeSort). *Communications of the ACM*, 7 (1964), 701.

- L. R. Ford. Network Flow Theory. RAND Corporation Technical Report P-923, 1956.
- L. R. Ford and D. R. Fulkerson. *Flows in Networks*. Princeton University Press, 1962.
- D. Gale. The two-sided matching problem: Origin, development and current issues. *International Game Theory Review*, 3:2/3 (2001), 237–252.
- D. Gale and L. Shapley. College admissions and the stability of marriage. *American Mathematical Monthly* 69 (1962), 9–15.
- M. R. Garey and D. S. Johnson. *Computers and Intractability. A Guide to the Theory of NP-Completeness*. Freeman, 1979.
- M. Garey, D. Johnson, G. Miller, and C. Papadimitriou. The complexity of coloring circular arcs and chords. *SIAM J. Algebraic and Discrete Methods*, 1:2 (June 1980), 216–227.
- M. Ghallab, D. Nau, and P. Traverso. *Automated Planning: Theory and Practice*. Morgan Kaufmann, 2004.
- M. X. Goemans and D. P. Williamson. The primal-dual method for approximation algorithms and its application to network design problems. In *Approximation Algorithms for NP-Hard Problems*, edited by D. S. Hochbaum. PWS Publishing, 1996.
- A. Goldberg. Efficient Graph Algorithms for Sequential and Parallel Computers. Ph.D. thesis, MIT, 1986.
- A. Goldberg. Network Optimization Library. <http://www.avglab.com/andrew/soft.html>.
- A. Goldberg, É. Tardos, and R. E. Tarjan. Network flow algorithms. In *Paths, Flows, and VLSI-Layout*, edited by B. Korte et al. Springer-Verlag, 1990.
- A. Goldberg and R. Tarjan. A new approach to the maximum flow problem. *Proc. 18th ACM Symposium on Theory of Computing*, pp. 136–146, 1986.
- M. Golin, R. Raman, C. Schwarz, and M. Smid. Simple randomized algorithms for closest pair problems. *Nordic J. Comput.*, 2 (1995), 3–27.
- M. C. Golumbic. *Algorithmic Graph Theory and Perfect Graphs*. Academic Press, 1980.
- R. L. Graham. Bounds for certain multiprocessing anomalies. *Bell System Technical Journal* 45 (1966), 1563–1581.
- R. L. Graham. Bounds for multiprocessing timing anomalies. *SIAM J. Applied Mathematics* 17 (1969), 263–269.
- R. L. Graham and P. Hell. On the history of the minimum spanning tree problem. *Annals of the History of Computing*, 7 (1985), 43–57.

- M. Granovetter. Threshold models of collective behavior. *American Journal of Sociology* 83:6(1978), 1420–1443.
- D. Greig, B. Porteous, and A. Seheult. Exact maximum *a posteriori* estimation for binary images. *J. Royal Statistical Society B*, 51:2(1989), pp. 271–278.
- D. Gusfield. *Algorithms on Strings, Trees, and Sequences: Computer Science and Computational Biology*. Cambridge University Press, 1997.
- D. R. Gusfield and R. W. Irving. *The Stable Marriage Problem: Structure and Algorithms*. MIT Press, 1989.
- L. A. Hall. Approximation algorithms for scheduling. In *Approximation Algorithms for NP-Hard Problems*, edited by D. S. Hochbaum. PWS Publishing, 1996.
- P. Hall. On representation of subsets. *J. London Mathematical Society* 10 (1935), 26–30.
- S. Haykin. *Neural Networks: A Comprehensive Foundation* (2nd ed.). Macmillan, 1999.
- D. S. Hirschberg. A linear space algorithm for computing maximal common subsequences. *Communications of the ACM* 18 (1975) 341–343.
- D. S. Hochbaum. Approximation algorithms for the set covering and vertex cover problems. *SIAM J. on Computing*, 11:3 (1982), 555–556.
- D. S. Hochbaum (ed.). *Approximation Algorithms for NP-Hard Problems*. PWS Publishing, 1996.
- D. S. Hochbaum. Approximating covering and packing problems: set cover, vertex cover, independent set and related problems. In *Approximation Algorithms for NP-Hard Problems*, edited by D. S. Hochbaum. PWS Publishing, 1996.
- D. S. Hochbaum and D. B. Shmoys. A best possible heuristic for the k -center problem. *Mathematics of Operations Research* 10:2 (1985), 180–184.
- D. S. Hochbaum and D. B. Shmoys. Using dual approximation algorithms for scheduling problems: Theoretical and practical results. *Journal of the ACM* 34 (1987), 144–162.
- W. Hoeffding. Probability inequalities for sums of bounded random variables. *J. American Statistical Association*, 58 (1963), 13–30.
- J. Hopfield. Neural networks and physical systems with emergent collective computational properties. *Proc. National Academy of Sciences of the USA*, 79 (1982), 2554–2588.
- D. A. Huffman. A method for the construction of minimum-redundancy codes. *Proc. IRE* 40: 9 (Sept. 1952), 1098–1101.
- A. Jain and R. Dubes. *Algorithms for Clustering Data*. Prentice Hall, 1981.
- T. R. Jensen and B. Toft. *Graph Coloring Problems*. Wiley Interscience, 1995.

- D. S. Johnson. Approximation algorithms for combinatorial problems. *J. of Computer and System Sciences*, 9 (1974), 256–278.
- M. Jordan (ed.). *Learning in Graphical Models*. MIT Press, 1998.
- A. Karatsuba and Y. Ofman. Multiplication of multidigit numbers on automata. *Soviet Physics Doklady*, 7 (1962), 595–596.
- D. Karger. Random Sampling in Graph Optimization Problems. Ph.D. Thesis, Stanford University, 1995.
- D. R. Karger, C. Stein. A new approach to the minimum cut problem. *Journal of the ACM* 43:4(1996), 601–640.
- N. Karmarkar. A new polynomial-time algorithm for linear programming. *Combinatorica*, 4:4(1984), 373–396.
- R. M. Karp. Reducibility among combinatorial problems. In *Complexity of Computer Computations*, edited by R. Miller and J. Thatcher, pp. 85–103. Plenum Press, 1972.
- B. Kernighan and S. Lin. An efficient heuristic procedure for partitioning graphs. *The Bell System Technical Journal*, 49:2 (1970), 291–307.
- S. Keshav. *An Engineering Approach to Computer Networking*. Addison-Wesley, 1997.
- L. Khachiyan. A polynomial algorithm in linear programming. *Soviet Mathematics Doklady*, 20:1(1979), 191–194.
- S. Kirkpatrick, C. D. Gelatt, Jr., and M. P. Vecchi. Optimization by simulated annealing. *Science*, 220:4598 (1983), 671–680.
- J. Kleinberg. Approximation Algorithms for Disjoint Paths Problems. Ph.D Thesis, MIT, 1996.
- J. Kleinberg and É. Tardos. Disjoint paths in densely embedded graphs. *Proc. 36th IEEE Symposium on Foundations of Computer Science*, pp. 52–61, 1995.
- D. E. Knuth, *The Art of Computer Programming*, Vol. 1: *Fundamental Algorithms* (3rd edition). Addison-Wesley, 1997a.
- D. E. Knuth. *The Art of Computer Programming*, Vol. 2: *Seminumerical Algorithms* (3rd edition). Addison-Wesley, 1997b.
- D. E. Knuth. Stable marriage and its relation to other combinatorial problems. *CRM Proceedings and Lecture Notes*, vol. 10. American Mathematical Society, 1997c.
- D. E. Knuth. *The Art of Computer Programming*, Vol. 3: *Sorting and Searching* (3rd edition). Addison-Wesley, 1998.
- V. Kolmogorov and R. Zabih. What energy functions can be minimized via graph cuts? *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 26:2 (2004), 147–159.

- D. Konig. Über Graphen und ihre Anwendung auf Determinantentheorie und Mengenlehre. *Mathematische Annalen*, 77 (1916), 453–465.
- B. Korte, L. Lovász, H. J. Prömel, A. Schrijver (eds.). *Paths, Flows, and VLSI-Layout*. Springer-Verlag, 1990.
- E. Lawler. *Combinatorial Optimization: Networks and Matroids*. Dover, 2001.
- E. L. Lawler, J. K. Lenstra, A. H. G. Rinnooy Kan, and D. B. Shmoys. *The Traveling Salesman Problem: A Guided Tour of Combinatorial Optimization*. Wiley, 1985.
- E. L. Lawler, J. K. Lenstra, A. H. G. Rinnooy Kan, and D. B. Shmoys. Sequencing and scheduling: Algorithms and complexity. In *Handbooks in Operations Research and Management Science* 4, edited by S. C. Graves, A. H. G. Rinnooy Kan, and P. H. Zipkin. Elsevier, 1993.
- F. T. Leighton, *Introduction to Parallel Algorithms and Architectures*. Morgan Kaufmann, 1992.
- F. T. Leighton, B. M. Maggs, and S. Rao. Packet routing and job-shop scheduling in $O(\text{congestion} + \text{dilation})$ steps. *Combinatorica*, 14:2 (1994), 167–186.
- D. Lelewler and D. S. Hirshberg. Data Compression. *Computing Surveys* 19:3 (1987), 261–297.
- J. K. Lenstra, D. Shmoys, and É. Tardos. Approximation algorithms for scheduling unrelated parallel machines. *Mathematical Programming*, 46 (1990), 259–271.
- L. Levin. Universal Search Problems (in Russian). *Problemy Peredachi Informatsii*, 9:3 (1973), pp. 265–266. For a partial English translation, see B. A. Trakhtenbrot, A survey of Russian approaches to Perebor (brute-force search) algorithms. *Annals of the History of Computing* 6:4 (1984), 384–400.
- L. Lovász. On the ratio of the optimal integral and fractional covers. *Discrete Mathematics* 13 (1975), 383–390.
- S. Martello and P. Toth. *Knapsack Problems: Algorithms and Computer Implementations*. Wiley, 1990.
- D. H. Mathews and M. Zuker. RNA secondary structure prediction. In *Encyclopedia of Genetics, Genomics, Proteomics and Bioinformatics*, edited by P. Clote. Wiley, 2004.
- K. Mehlhorn and St. Näher. *The LEDA Platform of Combinatorial and Geometric Computing*. Cambridge University Press, 1999.
- K. Menger. Zur allgemeinen Kurventheorie. *Fundam. Math.* 19 (1927), 96–115.
- K. Menger. On the origin of the n -Arc Theorem. *J. Graph Theory* 5 (1981), 341–350.
- N. Metropolis, A. W. Rosenbluth, M. N. Rosenbluth, A. H. Teller, and E. Teller. Equation of state calculations by fast computing machines. *J. Chemical Physics* 21 (1953), 1087–1092.

- M. Mitzenmacher and E. Upfal. *Probability and Computing: Randomized Algorithms and Probabilistic Analysis*. Cambridge University Press, 2005.
- D. Monderer and L. Shapley. Potential Games. *Games and Economic Behavior* 14 (1996), 124–143.
- R. Motwani and P. Raghavan. *Randomized Algorithms*. Cambridge University Press, 1995.
- John F. Nash, Jr. Equilibrium points in n -person games. *Proc. National Academy of Sciences of the USA*, 36 (1950), 48–49.
- S. B. Needleman and C. D. Wunsch. *J. Molecular Biology*. 48 (1970), 443–453.
- G. L. Nemhauser and L. A. Wolsey. *Integer and Combinatorial Optimization*. Wiley, 1988.
- J. Nesetril. A few remarks on the history of MST-problem. *Archivum Mathematicum Brno*, 33 (1997), 15–22.
- M. Newborn. *Kasparov versus Deep Blue: Computer Chess Comes of Age*. Springer-Verlag, 1996.
- R. Nowakowski (ed.). *Games of No Chance*. Cambridge University Press, 1998.
- M. Osborne. *An Introduction to Game Theory*. Oxford University Press, 2003.
- C. H. Papadimitriou. *Computational Complexity*. Addison-Wesley, 1995.
- C. H. Papadimitriou. Algorithms, games, and the Internet. *Proc. 33rd ACM Symposium on Theory of Computing*, pp. 749–753, 2001.
- S. Plotkin. Competitive routing in ATM networks. *IEEE J. Selected Areas in Communications*, 1995, pp. 1128–1136.
- F. P. Preparata and M. I. Shamos. *Computational Geometry: An Introduction*. Springer-Verlag, 1985.
- W. H. Press, B. P. Flannery, S. A. Teukolsky, and W. T. Vetterling. *Numerical Recipes in C*. Cambridge University Press, 1988.
- M. O. Rabin. Probabilistic algorithms. In *Algorithms and Complexity: New Directions and Recent Results*, edited by J. Traub, 21–39. Academic Press, 1976.
- B. Reed. Tree width and tangles, a new measure of connectivity and some applications. *Surveys in Combinatorics*, edited by R. Bailey. Cambridge University Press, 1997.
- N. Robertson and P. D. Seymour. An outline of a disjoint paths algorithm. In *Paths, Flows, and VLSI-Layout*, edited by B. Korte et al. Springer-Verlag, 1990.
- R. W. Rosenthal. The network equilibrium problem in integers. *Networks* 3 (1973), 53–59.
- S. Ross. *Introduction to Stochastic Dynamic Programming*, Academic Press, 1983.

- T. Roughgarden. Selfish Routing. Ph.D. thesis, Cornell University, 2002.
- T. Roughgarden. *Selfish Routing and the Price of Anarchy*. MIT Press, 2004.
- S. Russell and P. Norvig. *Artificial Intelligence: A Modern Approach* (2nd edition). Prentice Hall, 2002.
- D. Sankoff. The early introduction of dynamic programming into computational biology. *Bioinformatics* 16:1 (2000), 41–47.
- J. E. Savage. *Models of Computation*. Addison-Wesley, 1998.
- W. Savitch. Relationships between nondeterministic and deterministic tape complexities. *J. Computer and System Sciences* 4 (1970), 177–192.
- T. Schaefer. On the complexity of some two-person perfect-information games. *J. Computer and System Sciences* 16:2 (April 1978), 185–225.
- T. Schelling. *Micromotives and Macrobbehavior*. Norton, 1978.
- A. Schrijver. On the history of the transportation and maximum flow problems. *Math. Programming* 91 (2002), 437–445.
- R. Seidel. Backwards analysis of randomized geometric algorithms. In *New Trends in Discrete and Computational Geometry*, edited by J. Pach, pp. 37–68. Springer-Verlag, 1993.
- M. I. Shamos and D. Hoey. Closest-point problems. *Proc. 16th IEEE Symposium on Foundations of Computer Science*, pp. 151–162, 1975.
- C. E. Shannon and W. Weaver. *The Mathematical Theory of Communication*. University of Illinois Press, 1949.
- M. Sipser. The history and status of the P versus NP question. *Proc. 24th ACM Symposium on the Theory of Computing*, pp. 603–618, 1992.
- D. D. Sleator and R. E. Tarjan. Amortized efficiency of list update and paging rules. *Communications of the ACM*, 28:2 (1985), 202–208.
- M. Smid. Closest-point problems in computational geometry. In *Handbook of Computational Geometry*, edited by J. Rüdiger Sack and J. Urrutia, pp. 877–935. Elsevier Science Publishers, B.V. North-Holland, 1999.
- J. W. Stewart. *BGP4: Inter-Domain Routing in the Internet*. Addison-Wesley, 1998.
- L. Stockmeyer and A. K. Chandra. Provably difficult combinatorial games. *SIAM J. on Computing* 8 (1979), 151–174.
- L. Stockmeyer and A. Meyer. Word problems requiring exponential time. *Proc. 5th Annual ACM Symposium on Theory of Computing*, pp. 1–9, 1973.
- É. Tardos. Network Games. *Proc. 36th ACM Symposium on Theory of Computing*, pp. 341–342, 2004.

- R. E. Tarjan. Data structures and network algorithms. CBMS-NSF *Regional Conference Series in Applied Mathematics* 44. Society for Industrial and Applied Mathematics, 1983.
- R. E. Tarjan. Algorithmic design. *Communications of the ACM*, 30:3 (1987), 204–212.
- A. Tucker. Coloring a family of circular arcs. *SIAM J. Applied Mathematics*, 29:3 (November 1975), 493–502.
- V. Vazirani. *Approximation Algorithms*. Springer-Verlag, 2001.
- O. Veksler. Efficient Graph-Based Energy Minimization Methods in Computer Vision. Ph.D. thesis, Cornell University, 1999.
- M. Waterman. *Introduction to Computational Biology: Sequences, Maps and Genomes*. Chapman Hall, 1995.
- D. J. Watts. *Six Degrees: The Science of a Connected Age*. Norton, 2002.
- K. Wayne. A new property and faster algorithm for baseball elimination. *SIAM J. Discrete Mathematics*, 14:2 (2001), 223–229.
- J. W. J. Williams. Algorithm 232 (Heapsort). *Communications of the ACM*, 7 (1964), 347–348.