

Bibliography

- [Aga95] P. K. Agarwal and J. Matoušek: Dynamic half-space range reporting and its applications. *Algorithmica* 13:325–345 (1995).
- [Aga97] P. K. Agarwal: Range Searching. In J. E. Goodman and J. O’Rourke (eds.), *CRC Handbook of Computational Geometry*, pp 575–598, CRC Press, 1997.
- [Aga98E] P. K. Agarwal and J. Erickson: Geometric range searching and its relatives. In B. Chazelle, J. E. Goodman, and R. Pollack (eds.), *Advances in Discrete and Computational Geometry*, Contemporary Mathematics 223: 1–56, American Mathematical Society, 1998.
- [Aga98SW] P. K. Agarwal, M. Sharir, and E. Welzl: The discrete 2-center problem. *Discrete & Computational Geometry* 20:287–305 (1998).
- [Aga01APV] P. K. Agarwal, L. Arge, O. Procopiuc, and J. S. Vitter: A Framework for Index Bulk Loading and Dynamization. In *Proc. 28th Int. Coll. Automata, Languages and Programming (ICALP)*, 2001, pp 115–127.
- [Aga01BGHH] P. K. Agarwal, M. de Berg, J. Gudmundsson, M. Hammar, and H. J. Haverkort: Box-trees and R-trees with near-optimal query time. *Discrete & Computational Geometry* 28:291–312 (2002) (Chapter 3 of this thesis).
- [Aga02] P. K. Agarwal, S. Govindarajan, and S. Muthukrishnan: Range searching in categorical data: colored range searching on a grid. In *Proc. 10th European Symp. Algorithms (ESA 2002)*, pp 17–28.
- [Agg88] A. Aggarwal and J. S. Vitter: The Input/Output complexity of sorting and related problems. *Communications ACM* 31(9):1116–1127 (1988).
- [Agg97] C. Aggarwal, J. Wolf, P. Yu, and M. Epelman: The S-Tree: An Efficient Index for Multidimensional Objects. In *Proc. 5th Symp. Spatial Databases (SSD)*, 1997, LNCS 1262:350–373.
- [Alo85] N. Alon, Z. Füredi, and M. Katchalski: Separating pairs of points by standard boxes. *European J. Combinatorics* 6:205–210 (1985).

- [Ama96] N. Amato and Y. Wu: A randomized roadmap method for path and manipulation planning. In *Proc. Int. Conf. Robotics and Automation (ICRA)*, 1996, pp 113–120.
- [Ang97] C. H. Ang and T. C. Tan: New Linear Node Splitting Algorithm for R-trees. In *Proc. 5th Symp. Spatial Databases (SSD)*, 1997, LNCS 1262: 339–349.
- [Arg02] L. Arge, O. Procopiuc, and J. S. Vitter: Implementing I/O-efficient data structures using TPIE. In *Proc. 10th European Symp. Algorithms (ESA)*, 2002, pp 88–100.
- [Arg03] L. Arge and J. Vahrenhold: I/O-efficient dynamic planar point location. *Computational Geometry: Theory & Applications* (to appear).
- [Ary00] A. Arya and D. Mount: Approximate range searching. *Computational Geometry: Theory & Applications* 17(3-4):135–152 (2000).
- [Bar96] G. Barequet, B. Chazelle, L. J. Guibas, J. S. B. Mitchell, and A. Tal: BOXTREE: A hierarchical representation for surfaces in 3D. *Computer Graphics Forum* 15(3):387–396 (1996).
- [Bar99] G. Barequet and S. Har-Peled: Efficiently approximating the minimum-volume bounding box of a point set in three dimensions. In *Proc. 10th Symp. Discrete Algorithms (SODA)*, 1999, pp 82–91.
- [Bay72] R. Bayer and E. McCreight: Organization and maintenance of large ordered indexes. *Acta Informatica* 1:173–189 (1972).
- [Bgn99] G. J. A. van den Bergen: *Collision Detection in Interactive 3D Computer Animation*. Ph.D. thesis, Eindhoven Technical University, 1999.
- [Bhm99] C. Böhm, G. Klump, and H.-P. Kriegel: XZ-Ordering: A Space-Filling Curve for Objects with Spatial Extension. In *Proc. 6th Symp. Spatial Databases (SSD)*, 1999, LNCS 1651:75–90.
- [Bkr92] B. Becker, P. G. Franciosa, S. Gschwind, T. Ohler, G. Thiemt, and P. Widmayer: Enclosing many boxes by an optimal pair of boxes. In *Proc. 17th Symp. Theoretical Aspects of Computer Science (STACS)*, 1992, LNCS 577:475–486.
- [Bmn90] N. Beckmann, H.-P. Kriegel, R. Schneider, and B. Seeger: The R*-tree: An Efficient and Robust Access Method for Points and Rectangles. In *Proc. Management of Data (SIGMOD)*, 1990, pp 323–331.
- [Brg92] M. de Berg, S. Carlsson, and M. Overmars: A general approach to dominance in the plane. *J. Algorithms* 13:274–296 (1992).

- [Brg00] M. de Berg, J. Gudmundsson, M. Hammar, and M. Overmars: On R-trees with low stabbing number. In *Proc. 8th European Symp. Algorithms (ESA)*, 2000, LNCS 1879:167–178.
- [Brg97KOS] M. de Berg, M. van Kreveld, M. Overmars, and O. Schwarzkopf: *Computational Geometry: Algorithms and Applications*, Springer, 1997.
- [Brg97KSV] M. de Berg, M. J. Katz, A. F. van der Stappen, and J. Vleugels: Realistic input models for geometric algorithms. *Algorithmica* 34:81–97 (2002).
- [Bri94] T. Brinkhoff, H.-P. Kriegel, R. Schneider, and B. Seeger: Multi-step processing of spatial joins. In *Proc. Management of Data (SIGMOD)*, 1994, pp 197–208.
- [Btd98] S. Berchtold, C. Böhm, and H.-P. Kriegel: Improving the query performance of high-dimensional index structures by bulk load operations. In *Proc. Extending Database Technology (EDBT)*, 1998, LNCS 1377:216–230.
- [Cal95] P. B. Callahan and S. R. Kosaraju: A decomposition of multidimensional point sets with applications to k -nearest-neighbors and n -body potential fields, *J. ACM* 42(1):67–90 (1995).
- [Che89] L. P. Chew: There are planar graphs almost as good as the complete graph, *J. Computer and System Sciences* 39:205–219 (1989).
- [Chn00] T. M. Chan: Approximating the diameter, width, smallest enclosing cylinder, and minimum-width annulus, In *Proc. 16th Symp. Computational Geometry (SoCG)*, 2000, pp 300–309.
- [Chn02] T. M. Chan: Semi-online maintenance of geometric optima and measures. In *Proc. 13th Symp. Discrete Algorithms (SODA)*, 2002, pp 474–483.
- [Chz88] B. Chazelle: A functional approach to data structures and its use in multidimensional searching, *SIAM J. Computing* 17:427–462 (1988).
- [Chz01] B. Chazelle: *The Discrepancy Method: Randomness and Complexity*, Cambridge University Press, 2001.
- [Com79] D. Comer: The ubiquitous B-tree. *ACM Computing Surveys* 11(2):121–137 (1979).
- [Cor90] T. H. Cormen, C. E. Leiserson, and R. L. Rivest: *Introduction to Algorithms*, MIT Press, 1990.
- [Dey98] T. K. Dey: Improved bounds for planar k -sets and related problems. *Discrete & Computational Geometry* 19(30):373–382 (1998).
- [Dwt94] D. J. DeWitt, N. Kabra, J. Luo, J. M. Patel, and J.-B. Yu: Client-server paradise. In *Proc. Very Large Databases (VLDB)*, 1994, pp 558–569.

- [Dic00] M. Dickerson, C. A. Duncan, and M. T. Goodrich: K-D trees are better when cut on the longest side. In *Proc. 8th European Symp. Algorithms (ESA)*, 2000, LNCS 1879:179–190.
- [Dun99] C. A. Duncan: *Balanced Aspect Ratio Trees*. Ph.D. thesis, John Hopkins University, 1999.
- [Dun99GK] C. A. Duncan, M. T. Goodrich, and S. G. Kobourov: Balanced aspect ratio trees: Combining the advantages of k-d trees and octrees. In *Proc. 10th Symp. Discrete Algorithms (SODA)*, 1999, pp 300–309.
- [Epp00] D. Eppstein: Spanning trees and spanners, In J.-R. Sack and J. Urrutia (eds.), *Handbook of Computational Geometry*, pp 425–461, Elsevier, 2000.
- [Fal87] C. Faloutsos, T. Sellis, and N. Roussopoulos: Analysis of object oriented spatial access methods. In *Proc. Management of Data (SIGMOD)*, 1987, pp 426–439.
- [Fal92] C. Faloutsos and I. Kamel: *Packed R-trees using fractals*, technical report CS-TR-3009, University of Maryland, 1992.
- [Gae98] V. Gaede and O. Günther: Multidimensional access methods, *ACM Computing Surveys* 30:170–205 (1998).
- [Got96] S. Gottschalk, M. C. Lin, and D. Manocha: OBB-Tree: a hierarchical structure for rapid interference detection, In *Proc. Computer Graphics (SIGGRAPH)*, 1996, pp 171–180.
- [Grc98a] Y. J. García, M. A. López, and S. T. Leutenegger: A Greedy Algorithm for Bulk Loading R-trees, In *Proc. Advances in GIS*, 1998, pp 163-164, and technical report 97-02, University of Denver.
- [Grc98b] Y. J. García, M. A. López, and S. T. Leutenegger: On Optimal Node Splitting for R-trees, In *Proc. Very Large Databases (VLDB)*, 1998, pp 334–344.
- [Gry79] M. R. Garey and D. S. Johnson: *Computers and Intractability: A Guide to the Theory of NP-Completeness*, W. H. Freeman, 1979.
- [Gup95] J. Gupta, R. Janardan, and M. Smid: Further results on generalized intersection searching problems: counting, reporting, and dynamization. *J. Algorithms* 19: 282–317 (1995).
- [Gut84] A. Guttmann: R-trees: a dynamic indexing structure for spatial searching. In *Proc. Management of Data (SIGMOD)*, 1984, pp 47–57.
- [Has95] R. Hassin and A. Tamir: On the minimum diameter spanning tree problem, *Information Processing Letters* 53(2):109–111 (1995).

- [Hav02] H. J. Haverkort, M. de Berg, and J. Gudmundsson: Box-trees for collision checking in industrial installations. In *Proc. 18th Symp. Computational Geometry (SoCG)*, 2002, pp 53–62.
- [Hav02a] H. J. Haverkort, M. de Berg, and J. Gudmundsson: *Box-Trees for Collision Checking in Industrial Installations*, technical report UU-CS-2002-027, Utrecht University, 2002.
- [Ho91] J.-M. Ho, D. T. Lee, C.-H. Chang, and C. K. Wong: Minimum diameter spanning trees and related problems. *SIAM J. Computing* 20(5):987–997 (1991).
- [Jag90] H. V. Jagadish: Spatial Search with Polyhedra. In *Proc. Int. Conf. Data Engineering (ICDE)*, 1990, pp 311-319
- [Jan93] R. Janardan and M. A. Lopez: Generalized intersection searching problems. *Int. J. Computational Geometry and Applications* 3:39–70 (1993).
- [Kam93] I. Kamel and C. Faloutsos: On Packing R-trees In *Proc. Conf. Information and Knowledge Management (CIKM)*, 1993, pp 490–499.
- [Kam94] I. Kamel and C. Faloutsos: Hilbert R-tree: An improved R-tree using fractals, In *Proc. Very Large Databases (VLDB)*, 1994, pp 500–509.
- [Kan97] K. V. Ravi Kanth, D. Agrawal, A. El Abbadi, and A. K. Singh: Indexing Non-uniform Spatial Data. In *Proc. Int. Database Engineering and Applications Symp. (IDEAS)*, 1997, pp 289–298.
- [Kan98] K. V. Ravi Kanth, and A. K. Singh: Optimal Dynamic Range Searching in Non-replicating Index Structures. In *Int. Conf. Database Theory (ICDT)*, 1999, LNCS 1540:257-276.
- [Kar84] N. Karmarkar: A new polynomial-time algorithm for linear programming, *Combinatorica* 4:373–395 (1984).
- [Kat97] N. Katayama and S. Satoh: The SR-tree: An Index Structure for High-Dimensional Nearest Neighbor Queries. In *Proc. Management of Data (SIGMOD)*, 1997, pp 369–380.
- [Kav95] L. Kavraki: *Random networks in configuration space for fast path planning*. Ph.D. thesis, Stanford University, 1995.
- [Klo98] J. T. Klosowski, M. Held, J. S. B. Mitchell, H. Sowizral, and K. Zikan: Efficient collision detection using bounding volume hierarchies of k-DOPs. *IEEE Trans. Visualization and Computer Graphics* 4(1):21–36 (1998).
- [Kre92] M. van Kreveld: *New Results on Data Structures in Computational Geometry*. Ph.D. thesis, Utrecht University, 1992.

- [Krs98] S. Krishnan, A. Pattekar, M. C. Lin and D. Manocha: Spherical shells: a higher order bounding volume for fast proximity queries, *Proc. Workshop Algorithmic Foundations of Robotics (WAFR)*, 1998, pp 177–190.
- [Krz03] D. Krizanc, P. Morin, and M. Smid: Range mode and range median queries on lists and trees, In *Proc. 14th Int. Symp. Algorithms and Computation (ISAAC)*, 2003, pp 517–526.
- [Lar00] E. Larsen, S. Gottschalk, M. C. Lin, and D. Manocha: Fast Distance Queries with Rectangular Swept Sphere Volumes. In *Proc. Int. Conf. Robotics and Automation (ICRA)*, 2000, pp 3719–3726.
- [Lau78] U. Lauther: 4-dimensional binary search trees as a means to speed up associative searches in design rule verification of integrated circuits. *J. Design Automation and Fault-Tolerant Computing* 2(3):241–247 (1978).
- [Leu97] S. T. Leutenegger, M. A. Lopez, and J. Edington: STR: A simple and efficient algorithm for R-tree packing, In *Proc. 13th Int. Conf. Data Engineering (ICDE)*, 1997, pp 497–506.
- [Man99] Y. Manolopoulos, Y. Theodoridis, and V. Tsotras: *Advanced Database Indexing*, Kluwer Academic Publishers, 1999.
- [Man03] Y. Manolopoulos, A. Nanopoulos, A. N. Papadopoulos, and Y. Theodoridis: *R-Trees Have Grown Everywhere*, technical report available at <http://www.rtreeportal.org/>, 2003.
- [Mat93] J. Matoušek: Range Searching with Efficient Hierarchical Cuttings. *Discrete & Computational Geometry* 10:157–182 (1993).
- [Meg83] N. Megiddo: Applying parallel computation algorithms in the design of serial algorithms. *J. ACM* 30(4):852–865 (1983).
- [Molog] *MOLOG: Motion for Logistics*, Esprit LTR Project 28226, <http://www.laas.fr/molog/>.
- [Nar04] G. Narasimhan and M. Smid: *Geometric Spanner Networks*, Cambridge University Press, to appear.
- [Nie97] J. Nievergelt and P. Widmayer: Spatial data structures: concepts and design choices, In M. van Kreveld, J. Nievergelt, T. Roos, and P. Widmayer (eds.), *Algorithmic Foundations of Geographic Information Systems*, LNCS 1340:153–198, 1997.
- [Nie00] J. Nievergelt and P. Widmayer: Spatial data structures: concepts and design choices, In J.-R. Sack and J. Urrutia (eds.), *Handbook of Computational Geometry*, pp 725–764, Elsevier, 2000.
- [Oos90] P. van Oosterom: *Reactive Data Structures for Geographic Information Systems*. Ph.D. thesis, Leiden University, 1990.

- [Ore90] J. Orenstein: A comparison of spatial query processing techniques for native and parameter spaces. In *Proc. Management of Data (SIGMOD)*, 1990, pp 343–352.
- [Pel89] D. Peleg and A. Schäffer: Graph spanners. *J. Graph Theory* 13:99–116 (1989).
- [Pro03] O. Procopiuc, P. K. Agarwal, L. Arge, and J. S. Vitter: Bkd-tree: A dynamic scalable kd-tree, In *Proc. Symp. Spatial and Temporal Databases (SSTD)*, 2003, pp 46–65.
- [Rob81] J. Robinson: The K-D-B tree: A search structure for large multidimensional dynamic indexes. In *Proc. Management of Data (SIGMOD)*, 1981, pp 10–81.
- [Ros01] K. A. Ross, I. Sitzmann, and P. J. Stuckey: Cost-based Unbalanced R-Trees. In *Proc. Statistical and Scientific Database Management (SSDBM)*, 2001, pp 203–212.
- [Rou85] N. Roussopoulos and D. Leifker: Direct spatial search on pictorial databases using packed R-trees. In *Proc. Management of Data (SIGMOD)*, 1985, pp 17–31.
- [Sha01] M. Sharir, S. Smorodinsky, and G. Tardos: An Improved Bound for k -Sets in Three Dimensions. *Discrete & Computational Geometry* 26(2): 195–204 (2001).
- [Sel87] T. Sellis, N. Roussopoulos, and C. Faloutsos: The R^+ -tree: A dynamic index for multi-dimensional objects, In *Proc. Very Large Databases (VLDB)*, 1987, pp 507–518.
- [Sit99] I. Sitzmann and P. J. Stuckey: *The O-Tree—A Constraint-Based Index Structure*, technical report, University of Melbourne, 1999.
- [Spr03] M. J. Spriggs, J. M. Keil, S. Bespamyatnikh, M. Segal, and J. Snoeyink: Computing a $(1 + \epsilon)$ -approximate geometric minimum-diameter spanning tree. *Algorithmica*, 38(4):577–589 (2004).
- [Sta94] A. F. van der Stappen: *Motion Planning amidst Fat Obstacles*. Ph.D. thesis, Utrecht University, 1994.
- [Sta98] A. F. van der Stappen, M. Overmars, M. de Berg, and J. Vleugels: Motion planning in environments with low obstacle density. *Discrete & Computational Geometry* 20:561–587 (1998).
- [Sve97] P. Švestka: *Robot motion planning using probabilistic roadmaps*. Ph.D. thesis, Utrecht University, 1997.
- [The96] Y. Theodoridis and T. Sellis: A model for the prediction of R-tree performance. In *Proc. Principles Database Systems (PODS)*, 1986, pp 161–171.

- [Tiger] *TIGER/LineTM files, 1997 technical documentation*,
<http://www.census.gov/geo/tiger/TIGER97D.pdf>, 1998.
- [Whi96] D. A. White and R. Jain: Similarity Indexing: Algorithms and Performance. In *Storage and Retrieval for Image and Video Databases (SPIE)* 1996, pp 62–73.
- [Zho99] Y. Zhou and S. Suri: Analysis of a bounding box heuristic for object intersection, In *Proc. 10th Symp. Discrete Algorithms (SODA)*, 1999, pp 830–839.