

Publications

Journal Publications

1. *Optimal parallel randomized algorithms for three-dimensional convex hulls and related problems*, with J. Reif, SIAM Journal on Computing, 21:3, June 1992 pp. 466–485.
2. *Optimal randomized parallel algorithms for computational geometry*, with J. Reif, Algorithmica, 1992:7, pp. 91–117.
3. *Two Optimal algorithms for mesh using shear sort*, with I.D. Scherson and Y. Ma, Journal of Parallel and Distributed Computing, Feb 1989, pp. 151-165.
4. *Parallel Sorting in Two dimensional VLSI models of Computation*, with I.D. Scherson, IEEE Transaction on Computers, February 1989, pp. 238-249.
5. *Finding an approximate-median with high probability in constant parallel time*, Information Processing Letters, 34, 1990, pp. 77-80.
6. *Random Sampling techniques for binary search on fixed connection networks with applications to geometric algorithms*, with J. Reif, SIAM Journal on Computing, June 1994, pp. 633-651.
7. *Dynamic point-location in arrangements of hyperplanes*, with K. Mulmuley, Discrete and Computational Geometry (Special issue), 8, 1992, pp. 335–360.
8. *On Parallel Integer Sorting*, with S. Rajasekaran, Acta Informatica, 29, Jan 1992 pp. 1–15.
9. *Some Observations on Skip-Lists*, Information Processing Letters, 39, August 1991, pp. 173–176.
10. *Improved Selection in Totally Monotone Arrays*, with Y. Mansour, J. Park and B. Scheiber, Int'l Journal on Computational Geometry and Applications, 3, 1993, pp. 115-132.
11. *Fractional Cascading Revisited*, Journal of Algorithms, 19, Sept 1995, pp. 161–172.
12. *An efficient output-sensitive hidden-surface removal algorithm for polyhedral terrains*, with J. Reif, Mathematical and Computer Modelling, 21:5, 1995, pp. 89–104.
13. *Selection in Monotone Matrices and computing k -th Nearest Neighbours*, with P. Agarwal, Journal of Algorithms, 20, June 1996, pp. 581–601.
14. *Lower bounds for parallel algebraic decision trees, parallel complexity of convex hulls and related problems*, Theoretical Computer Science, 188, 1997, pp. 59–78.
15. *Parallel searching in generalized Monge arrays with applications*, with A. Aggarwal, D. Kravets, J. Park, Algorithmica, 19:3, 1997, pp. 291 – 317.
16. *Optimal output-sensitive algorithms for constructing planar hulls in parallel*, with N. Gupta, Computational Geometry: Theory and Applications, 8, 1997, pp. 151-166.

17. *On a simple, practical optimal output-sensitive randomized planar convex-hull algorithm*, with B. Bhattacharya, *Journal of Algorithms* 25, Oct 1997, pp. 177–193.
18. *Distribution sensitive algorithms*, with N. Gupta, *Nordic Journal on Computing* (special issue), 6, 1999, pp. 194 – 211.
19. *An efficient output-size sensitive parallel algorithm for hidden-surface removal for terrains*, with N. Gupta, *Algorithmica*, 31, 2001, pp. 179 – 207.
20. *Fast and optimal parallel multidimensional search in PRAMs with applications to linear-programming and related problems*, with Martin Dyer, *SIAM Journal on Computing*, 30 (5), 2001.
21. *Improved Algorithms for Uniform Partitions of Points*, with P. Agarwal and B. Bhattacharya, *Algorithmica*, 32(4), 2002, pp. 521 – 539.
22. *Planar Graph Blocking for External Searching*, with S. Baswana, *Algorithmica*, 34(3), 2002, pp 298–308.
23. *Towards a theory of cache-efficient algorithms* with S. Chatterjee, N. Dumeer, *Journal of the ACM*, 49(6), Nov 2002, pp 828 –858.
24. *Faster output-sensitive algorithms for three dimensional convex hull and maximal vector problem*, with N. Gupta, *Journal of Parallel and Distributed Computing* 63(4), 2003, pp. 488 – 500.
25. *Improved Decremental Algorithms for Maintaining Transitive Closure and All-Pairs Shortest Paths*, with S. Baswana and R. Hariharan, *to appear Journal of Algorithms*.
26. *A linear time algorithm for approximate 2-means clustering*, with Y. Sabharwal, *to appear*, *Computational Geometry: Theory and Applications*.
27. *A generalization of the 0-1 principle for sorting*, with S. Rajasekaran, *to appear*, *Information Processing Letters*.

Invited Chapters

- *A case for randomized parallel algorithms*, with J. Reif, NSF-ARC Workshop on ‘Opportunities and Constraints of Parallel Computing’, IBM Almaden, San Jose, Dec 1988, J.L. Sanz ed., Springer Verlag.
- *Random Sampling Techniques and Parallel Algorithms Design*, with S. Rajasekaran, *Synthesis of Parallel Algorithms*, J. Reif ed., Morgan Kaufman, 1993.
- *Parallel Computational Geometry: An approach using randomization* with J. Reif, *Handbook of Computational Geometry*, J. Sacks and J. Urrutia eds., Elsevier Science Publishing.
- *Concentration of measure for randomized algorithms: techniques and applications*, with D. Dubhashi, *invited chapter for Handbook on Randomized Algorithms*.

- Randomized Algorithms for Geometric Optimization, with P. Agarwal, *invited chapter for Handbook on Randomized Algorithms*.
- Randomized graph data structures for approximate shortest paths, with S. Baswana, invited chapter in *Handbook of Data Structures and Applications*, Chapman & Hall/CRC pub.

Conference Publications

1. *Shear-sort; a true two-dimensional sorting technique for VLSI networks*, with I.D. Scherson and Adi Shamir, Intl Conf on Parallel Processing, Aug 1986.
2. *The distance bound for sorting on two- dimensional mesh connected processor arrays is tight*, with Y. Ma and I.D. Scherson, Proceedings of the 25th Annual IEEE Symposium on foundations of Computer Science (FOCS), 1986.
3. *Optimal randomized parallel algorithms for computational geometry*, with J. Reif, International Conference on Parallel Processing, St. Charles, Illinois, 1987.
4. *An efficient output-sensitive hidden surface elimination algorithm and its parallelization*, with J. Reif, 4th ACM Annual Symp on Computational Geometry, 1988.
5. *Polling: A new randomized sampling method for computational geometry*, with J. Reif, Proc. of the 21st ACM Annual Symposium on the Theory of Computing (STOC), Seattle, Washington 1989.
6. *Random Sampling techniques for binary search on fixed connection networks with applications to geometric algorithms*, with J. Reif, in A.C.M. Symposium on Parallel Architectures and Algorithms, Greece, 1990.
7. *Parallel searching in generalized Monge arrays with applications*, with A. Aggarwal, D. Kravets, J. Park, A.C.M. Symposium on Parallel Architectures and Algorithms, Greece, 1990.
8. *Improved Selection in Totally Monotone Arrays*, with Y. Mansour, J. Park and B. Scheiber, Proc. of the Foundations of Software Technology and Theoretical Computer Science, 1991.
9. *Dynamic point-location in arrangements of hyperplanes*, with K. Mulmuley, A.C.M. Symposium on Computational Geometry, 1991.
10. *Fractional Cascading Simplified*, Proceedings of the 2nd Scandinavian Workshop on Algorithmic Theory, 1992, pp. 212-220.
11. *Selection in Monotone Matrices and computing k-th Nearest Neighbours*, with P. Agarwal, Proc. of the Scandinavian Workshop on Algorithmic Theory, 1994.
12. *Lower bounds for parallel algebraic decision trees, complexity of convex hulls and related problems* , Proc. of the FST&TCS Foundations of Software Technology and Theoretical Computer Science, 1994, Madras, India.

13. *Faster Output-Sensitive Parallel Convex Hulls for $d \leq 3$: Optimal Sublogarithmic Algorithms for Small Outputs*, with N. Gupta, A.C.M. Symposium on Computational Geometry, Philadelphia, 1996.
14. *Parallel multidimensional searching using approximation algorithms with applications to linear programming and related problems*, ACM symposium on Parallel Algorithms and Architectures, Italy, 1996.
15. *An improved output-sensitive parallel algorithm for hidden-surface removal for terrains*, with N. Gupta, *Proc. of*, ACM Int'l Parallel Processing Symp., 1998.
16. *Distribution sensitive algorithms*, with N. Gupta, Scandinavian Workshop on Algorithmic Theory, 1998.
17. *Output-Sensitive Algorithms for Uniform Partitions of Points*, with P. Agarwal and B. Bhattacharya, ISAAC 99, Madras, India.
18. *Towards a theory of cache-efficient algorithms* with S. Chatterjee, Proc. of the SODA, San-Francisco, 2000.
19. *Cache-Efficient Matrix Transposition* with S. Chatterjee, Proc. of HPCA, France, 2000.
20. *Planar Graph Blocking for External Searching*, with S. Baswana, Proc. of FSTTCS 2000, LNCS 1974, pp. 252 – 263.
21. *Optimal, Output-Sensitive Algorithms for Constructing Upper Envelope of Line Segments in Parallel*, with N. Gupta and S. Chopra, Proc. of FSTTCS 2001, LNCS 2245, pp. 183–194.
22. *Improved online algorithms for transitive-closure and all-pairs shortest paths in digraphs for edge deletions*, with S. Baswana, R. Hariharan, *to appear*, STOC 2002, pp. (34) 117 -123.
23. *Fair adaptive Bandwidth Allocation: a rate control based active queue management*, with A. Kamra, H. Saran, R. Shorey, Networking 2002, Pisa Italy, pp. 838 – 849.
24. *Maintaining Approximate All-Pair-Shortest-Paths under deletion* , with S. Baswana and R. Hariharan , SODA 2003, pp. 394–403.
25. *Nearest Neighbor Searching using Point Location in Balls: with applications to approximate Voronoi Decompositions*, with Y. Sabharwal and N.Sharma Proc of 22nd FSTTCS 2002, LNCS 2556, pp 311–323.
26. *A Simple Linear Time Algorithm for Computing a $(2k - 1)$ -Spanner of $O(n^{1+1/k})$ Size in Weighted Graphs*, with S. Baswana, ICALP 2003, pp. 384–396.
27. *Approximate distance oracles for unweighted graphs in $O(n^2)$ time*, with S. Baswana, SODA 2004, pp. 271 – 280.
28. *A simple linear time approximation algorithm for geometric k-means problem in any dimension*, with A. Kumar and Y. Sabharwal, FOCS 2004, pp. 454–462.

29. *PDM Sorting Algorithms that Take a Small Number of Passes*, with S. Rajasekaran, to appear International Parallel and Distributed Processing Symposium 2005.
30. *Linear Time Algorithms for Clustering Problems in any dimensions* with A. Kumar and Y. Sabharwal, to appear, ICALP 2005.