Takao Asano

Date of Birth January 7, 1949; in Japan

Nationality Japanese

Present Position

Professor
Department of Information and System Engineering
Chuo University
Bunkyo-ku, Tokyo 112-8551, Japan
Tel.+81-3-3817-1686
Fax.+81-3-3817-1681
email: asano@ise.chuo-u.ac.jp

Education

B.E. degree in Electrical Communications in March 1972 from Tohoku University
M.E. degree in Electrical Communications in March 1974 from Tohoku University
D.E. degree in Electrical Communications in March 1977 from Tohoku University

Dissertation Computational Complexity on Combinatorial Problems

Occupation

April 1977 – October 1980: Research Associate of Tohoku University
October 1980 – March 1985: Lecturer of The University of Tokyo
April 1985 – March 1992: Associate Professor of Sophia University
April 1992 – : Professor of Chuo University

Research Interests

Approximation algorithms, computational geometry, network algorithms, data structures

Journal Papers

1. T. Asano and I. Takanami, The length of shortest closed walks passing all transition arcs in machines, Transactions of Institute of Electronics and Communication Engineers of Japan, 58-D (1975), pp.17–22 (in Japanese).

2. T. Asano, M. Shibui and I. Takanami, General results on tour lengths in machines and digraphs, SIAM Journal on Computing, 5 (1976), pp.629–645.

3. T. Nishizeki, T. Asano and N. Saito, On the maximal even matroids, Transactions of Institute of Electronics and Communication Engineers of Japan, J60–A (1977), pp.192–198 (in Japanese).

4. T. Asano, T. Nishizeki and N. Saito, NP-complete problems of finding a maximum cutset and of reducing graphs into bipartite ones, Transactions of Institute of Electronics and Communication Engineers of Japan, J60-D (1977), pp.531–538 (in Japanese).

5. T. Watanabe, T. Asano and N. Saito, Upper bounds on lengths of Chinese postman walks in undirected graphs, Transactions of Institute of Electronics and Communication Engineers of Japan, J62-D (1979), pp.289–296 (in Japanese).

6. T. Asano, T. Nishizeki and T. Watanabe, An upper bound on the length of a hamiltonian walk of a maximal planar graph, Journal of Graph Theory, 4 (1980), pp.315–336.

7. T. Asano, N. Saito, G. Exoo and F. Harary, The smallest 2-connected cubic bipartite nonhamiltonian graph, Discrete Mathematics, 38 (1982), pp.1–6.

8. T. Asano, Edge-deletion and -contraction problems restricted to the class of 3-connected graphs, Transactions of Institute of Electronics and Communication Engineers of Japan, J65-D (1982), pp.866–873 (in Japanese).

9. T. Nishizeki, T. Asano and T. Watanabe, An algorithm with a constant worst-case bound for the hamiltonian walk problem on maximal planar graphs, Discrete Applied Mathematics, 5 (1983), pp.211–222.

10. T. Asano and T. Hirata, Edge-contraction problems, Journal of Computer and Systems Science, 26 (1983), pp.197–208.

11. T. Asano, Properties of matroids characterizable in terms of excluded matroids, Journal of Combinatorial Theory, Series B, 34 (1983), pp.233–236.

12. T. Asano, Necessary and sufficient conditions for a property on graphs to be characterizable in terms of forbidden graphs, Transactions of Institute of Electronics and Communication Engineers of Japan, E66 (1983), pp.666–670.

13. H. Imai and T. Asano, Finding the connected components and a maximal clique of an intersection graph of rectangles in the plane, Journal of Algorithms, 4 (1983), pp.310–323.

14. T. Asano, S. Kikuchi and N. Saito, A linear algorithm for finding Hamiltonian cycles in 4-connected maximal planar graphs, Discrete Applied Mathematics, 7 (1984), pp.1–15.

15. T. Asano, T. Asano and Y. Ohsuga, Partitioning a polygonal region into a minimum number of triangles, Transactions of Institute of Electronics and Communication Engineers of Japan, E67 (1984), pp.232–233.

16. T. Asano, T. Nishizeki, J. Oxley and N. Saito, A note on the critical problem for matroids, European Journal of Combinatorics, 5 (1984), pp.93–97.

17. T. Asano, T. Nishizeki and P.D. Seymour, A note on nongraphic matroids, Journal of Combinatorial Theory, Series B, 37 (1984), pp.290–293.

18. M. Edahiro, I. Kokubo and T. Asano, A new point-location algorithm and its practical efficiency - comparison with existing algorithms, ACM Transactions on Graphics, 3 (1984), pp.86–109.

19. T. Asano, An approach to the subgraph homeomorphism problem, Theoretical Computer Science, 38 (1985), pp.249–267.

20. T. Asano, T. Asano and R.Y. Pinter, Polygon triangulation: efficiency and minimality, Journal of Algorithms, 7 (1986), pp.221–231.

21. H. Imai and T. Asano, Efficicent algorithms for geometric graph search problems, SIAM Journal on Computing, 15 (1986), pp.478–494.

22. T. Asano, T. Asano and H. Imai, Partitioning a polygonal region into trapezoids, Journal of ACM, 33 (1986), pp.290–312.

23. T. Asano, T. Asano, L. Guibas, J. Hershberger and H. Imai, Visibility of disjoint polygons, Algorithmica, 1 (1986), pp.49–63.

24. T. Asano, T. Asano and H. Imai, Shortest path between two simple polygons, Information Processing Letters, 24 (1987), pp.285–288.

25. H. Imai and T. Asano, Dynamic orthogonal segment intersection search, Journal of Algorithms, 8 (1987), pp.1–18.

26. T. Asano, An application of duality to edge-deletion problems, SIAM Journal on Computing, 16 (1987), pp.312–331.

27. M. Edahiro, K. Tanaka, T. Hoshino and T. Asano, A bucketing algorithm for the orthogonal segment intersection search problem and its practical efficiency, Algorithmica, 4 (1989), pp.61–76.

28. T. Asano, K. Yoshikawa and S. Suzuki, The design of a precompensator for multivariable adaptive control — A network-theoretic approach, IEEE Transactions on Automatic Control, AC-35 (1990), pp.706–710.

29. T. Tokuyama, T. Asano and S. Tsukiyama, A dynamic algorithm for placing rectangles without intersection, Journal of Information Processing, 14 (1991), pp.30–35.

30. T. Asano, H. Imai and A. Mukaiyama, A faster algorithm for finding a maximum independent set of a circle graph, Transactions of the Institute of Electronics, Information and Communication Engineers of Japan, E74 (1991), pp.681–683.

31. T. Asano, Dynamic programming on intervals, International Journal of Computational Geometry and Applications, 3 (1993), pp.323–330.

32. M. Takahashi, K. Imai and T. Asano, Graphical degree sequence problems, IEICE Transactions on Fundamentals, E77-A (1994), pp.546–552.

33. S. Kagami, M. Edahiro and T. Asano, Practical effiencies of planar point location algorithms, IEICE Transactions on Fundamentals, E77-A (1994), pp.608–614.

34. T. Asano, An $O(n \log\log n)$ time algorithm for constructing a graph of maximum connectivity with prescribed degrees, Journal of Computer and System Sciences, 51 (1995) pp.503–511.

35. T. Ono, T. Hirata and T. Asano, An approximation algorithm for MAX 3SAT, Journal of Information Processing, 37 (1996), pp.1760–1764 (in Japanese).

36. T. Asano, T. Ono and T. Hirata, Approximation algorithms for the maximum satisfiability problem, Nordic Journal of Computing, 3 (1996), pp.388–404.

37. T. Asano, Constructing a bipartite graph of maximum connectivity with prescribed degrees, Networks, 29 (1997), pp.245–263.

38. T. Ono, T. Hirata and T. Asano, Improvement of MAX SAT approximation algorithm with perturbation, Transactions of Institute of Electronics, Information and Communication Engineers D-I, J81-D-I (1998), pp.1107–1111 (in Japanese).

39. T. Asano, K. Iwama, H. Takada and Y. Yamashiata, Designing high-quality approximation algorithms for combinatorial optimization problems, IEICE Transactions on Information and Systems, E83-D (2000), pp.462–479.

40. T. Asano and Y. Asano, Recent developments in maximum flow algorithms, Journal of the Operations Research Society of Japan, 43 (2000), pp.2–31.

41. T. Asano and D.P. Williamson, Improved approximation algorithms for MAX SAT, Journal of Algorithms, 42 (2002), pp.173–202.

Conference Papers

1. T. Asano, T. Watanabe and T, Nishizeki, On the hamiltonian walks of maximal planar graphs, Proceedings of 1979 IEEE International Symposium on Circuits and Systems, Tokyo, 1979, pp.449–452.

2. T. Asano and T. Hirata, Edge-deletion and edge-contraction problems, Proceedings of the 14th Annual ACM Symposium on Theory of Computing, San Francisco, 1982, pp.245–254.

3. T. Asano and T. Asano, Minimum partition of polygonal regions into trapezoids, Proceedings of the 24th Annual IEEE Symposium on the Foundations of Computer Science, Tucson, 1983, pp.233–241.

4. H. Imai and T. Asano, Dynamic segment intersection search with applications, Proceedings of the 25th Annual IEEE Symposium on the Foundations of Computer Science, Singer Island, 1984, pp.393–402.

5. T. Asano, The subgraph homeomorphism and max-cut problems, Proceedings of 1985 IEEE International Symposium on Circuits and Systems, Kyoto, 1985, pp.1657–1660.

6. T. Asano, T. Asano, L. Guibas, J. Hershberger and H. Imai, Visibility polygon search and Euclidean shortest paths, Proceedings of the 26th Annual IEEE Symposium on the Foundations of Computer Science, Portland, 1985, pp.155–164.

7. T. Asano and T. Asano, Voronoi diagram for points in a simple polygon, Proceedings of the Japan-US Joint Seminar, 1986, Discrete Algorithms and Complexity (D.S. Johnson, et al. eds.), Academic Press, 1987, pp.51–64.

8. M. Edahiro, K. Tanaka, T. Hoshino and T. Asano, A bucketing algorithm for the orthogonal segment intersection search problem and its practical efficiency, Proceedings of the 3rd Annual ACM Symposium on Computational Geometry, Waterloo, 1987, pp.258–267.

9. T. Asano, Dynamic programming on intervals, Proceedings of the 2nd International Symposium on Algorithms (Lecture Note in Computer Science 557), Taipei, 1991, pp.199–207.

10. T. Asano, Graphical degree sequence problem with connectivity requirements, Proceedings of the 4th International Symposium on Algorithms and Computation (Lecture Note in Computer Science 762), Hong Kong, 1993, pp.38–47.

11. T. Ono, T. Hirata and T. Asano, An approximation algorithm for MAX 3-SAT, Proceedings of the 6th International Symposium on Algorithms and Computation (Lecture Notes in Computer Science 1004, Springer), Cairns, 1995, pp.163–170.

12. T. Asano, T. Ono and T. Hirata, Approximation algorithms for the maximum satisfiability problem, Proceedings of the 5th Scandinavian Workshop on Algorithm Theory (Lecture Notes in Computer Science 1097), Reykjavik, 1996, pp.100–111.

13. T. Asano, Approximation algorithms for MAX SAT: Yannakakis vs. Goemans-Williamson, Proceedings of the 5th Israel Symposium on Theory of Computing and Systems, Ramat Gan, 1997, pp.24–37.

14. T. Asano, K. Hori, T. Ono and T. Hirata, A theoretical framework of hybrid approaches to MAX SAT, Proceedings of the 8th International Symposium on Algorithms and Computation (Lecture Notes in Computer Science 1350, Springer), Singapore, 1997, pp.153–162.

15. T. Asano and D.P. Williamson, Improved Approximation Algorithms for MAX SAT, Proceedings of the 11th ACM-SIAM Symposium on Discrete Algorithms, San Francisco, 2000, pp.96–105.

16. T. Asano, M.M. Halldórsson, K. Iwama, and T. Matsuda, Approximation Algorithms for the Maximum Power Consumption Problem on Combinatorial Circuits, Proceedings of 11th International Symposium on Algorithms and Computation (Lecture Notes in Computer Science 1969, Springer), Taipei, 2000, pp.204–215.

17. R. Kato, K. Imai, and T. Asano, An Improved Algorithm for the Minimum Manhattan Network Problem, Proceedings of the 13th International Symposium on Algorithms and Computation (Lecture Notes in Computer Science 2518, Springer), Vancouver, 2002, pp.344–356.

Books

1. M. Iri, I. Shirakawa, S. Shinoda, Y. Kajitani, T. Asano et al., Graph Theory with Exercies, Corona Company, 1983 (in Japanese).

2. T. Asano, M. Edahiro, H. Imai, M. Iri and K. Murota, Practical use of bucketing techniques in computational geometry, G.T. Toussaint, ed., Computational Geometry, North-Holland, 1985, pp.153–195.

3. T. Asano, M. Sato and T. Ohtsuki, Computational geometry algorithms, T. Ohtsuki, ed., Advances in CAD for VLSI, 4: Layout Design and Analysis, Addison-Wesley, 1986, pp.295–347.

4. M. Iri, T. Koshizuka, T. Asano, et al., Computational Geometry and Geographic Information Processing, bit, Kyoritsu Shuppan, 1986 (2nd edition, 1993) (in Japanese).

5. T. Asano and H. Imai, Computation and Algorithms — Computer Science, Ohm Company, 1986 (in Japanese).

6. T. Sasaki, H. Imai, T. Asano and K. Sugihara, Computional Algebra and Computational Geometry, Iwanami Shoten, 1993 (in Japanese).

7. T. Asano, Information Structures (I: Data Strucures and Graph Algorithms, II: Network Algorithms and Data Structures), Nihon Hyoron Company, 1994 (in Japanese).

8. T. Asano, H. Imai, D.T. Lee, S. Nakano, and T. Tokuyama (eds.), Computing and Compbinatorics (Proceedings of the 5th International Conference, COCOON'99), Lecture Notes in Computer Science 1627, Springer, 1999.

9. T. Asano and H. Imai, Computation and Algorithms, Ohm Company, 2000 (in Japanese).

10. T. Asano, A. Tamura, N. Katoh, K. Sakurai, and S. Nakano (S. Fujishige, ed.), Discrete Structures and Algorithms VII, Kindai Kagaku Company, 2000 (in Japanese).

11. K. Sugihara, T. Ibaraki, T. Asano, and M. Yamashita (eds.), Algorithm Engineering: A Challenge to Hard Computation Problems, Kyoritsu Shuppan, 2001 (in Japanese).

Translations into Japanese

1. T. Asano and T. Asano, Keisan Kika Nyumon, Soken Shuppan, 1992 (Japanese translation of: F.P. Preparata and M.I. Shamos, Computational Geometry, Springer, 1988).

2. T. Asano, Chapter 4: Data Structures, Maruzen, 1994, pp.305–346 (Japanese translation of: K. Mehlhorn and A. Tsakalidis, Data Structures, J. van Leeuwen, ed., Handbook of Theoretical Computer Science Vol.A, 1990, pp.301–341).

3. T. Asano, Kinji Algorithms, Springer-Verlag Tokyo, 2002 (Japanese translation of: V.V. Vazirani, Approximation Algorithms, Springer-Verlag, 2001).