

# BIO DATA

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## **Academic Qualification :**

- Ph. D. from Indian Statistical Institute, Calcutta in 2001  
Title : Routing Algorithms in Channels, Switchboxes and MCM's in VLSI Layout Design
- M. Tech. Computer Science with Hons. in 1990 from Indian Statistical Institute, Calcutta, India
- Master of Statistics in 1988 from Indian Statistical Institute, Calcutta, India
- Bachelor of Statistics with Hons. in 1986 from Indian Statistical Institute, Calcutta, India

## **Present Status:**

Associate Professor  
Advanced computing and Microelectronics Unit  
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## **Professional Experience:**

1. Assistant Professor, Advanced computing and Microelectronics Unit, Indian Statistical Institute, Kolkata, from 2004 to 2006.
2. Programmer, Advanced Computing and Microelectronics Unit, Indian Statistical Institute, Kolkata, from 1999 to 2004.
3. Lecturer, Department of Computer Science and Application, *North Bengal University*, West Bengal, India, from 1990 to 1999.

## Academic visits

1. Institut de Mathematiques de Bourgogne, Universite de Bourgogne, Dijon, France, during Nov. 2005 - Oct. 2006.
2. Guest Researcher, School of Information Science, Advanced Institute of Science and Technology (JAIST), Ishikawa, Japan, during Jan. 24 - Feb. 23, 2005.
3. Visiting Professor, School of Computing Science, *Simon Fraser University*, Burnaby, Canada, during June-August, 2003.
4. Visiting Faculty, Department of Computer Science, *Visva-Bharati University*, Santiniketan, India, during 2001-2002.
5. Visiting Scientist, Department of Computer Science, *University of Helsinki*, Helsinki, Finland, during June-July, 2002.
6. Visiting Scientist, School of Technology and Computer Science, *Tata Institute of Fundamental Research*, Mumbai, India, in August, 2001.
7. Visitor, International Center for Theoretical Physics, I.C.T.P., P.O. Box 586, 34100 Trieste, ITALY, during Nov. 18 - Dec. 13, 1996.

## Teaching Experience:

During the last twenty years, I have taught the following courses in Undergraduate, Graduate and Postgraduate levels, and also in the U.G.C. conducted teachers' training courses in Computer Science and Engineering at the following Institutes/Organizations.

- Indian Statistical Institute
- University of North Bengal
- Dept. of Radio Physics and Electronics, Calcutta University
- Dept. of Computer Science, Visva Bharati

## Subjects taught:

Data and File Structures, Design and Analysis of Algorithms, Computational Geometry, VLSI Physical Design, Computer Organization, Computer Languages, Compiler Design, Data Base Management Systems, Discrete Mathematics, Assembly Language Programming, Systems Programming, Numerical Mathematics, Statistical Methods.

**Research Interest:** Graph Theory, Combinatorics, Graph Algorithms, Computational Geometry, Data Structure.

## Supervision of Ph.D. Thesis

1. Currently supervising two Research Fellows of ISI.
2. Dr. Sasanka Roy was awarded Ph.D. degree in 2007. Title of his thesis is "Algorithms for Some Geometric Facility Location and Path Planning Problems".

## Professional Activities:

1. Serving Program Committee of WALCOM 2010, CIAC 2010.
2. Served as Program Co-Char in WALCOM 2009.
3. Served as the Organizing committee in ISAAC 2006, FSTTCS 2006, ICCTA 2007, IWDC 2004 etc. Served as the Finance Chair of the 5th. International Workshop on Distributed Computing, Kolkata, India, Dec. 27-30, 2004.
4. Reviewer of different International Journal/Conferences, e.g.,

*Information Processing Letters* from Elsevier Science, *Theoretical Computer Science* from Elsevier Science, *IEEE Transactions on Mobile Computing*, *Journal of Electronic Testing* from Kluwer Academic Publishers, *IEE Proc. Computers & Digital Techniques*, *Integration, the VLSI journal*, *Journal of Parallel and Distributed Computing* from Elsevier Science,

*International Conference on VLSI Design* ('00, '01, '02, '03, '05) (co-sponsored by IEEE), *International Workshop on Distributed Computing* ('04) *Foundations of Software Technology and Theoretical Computer Science (FSTTCS)* ('04), *International Conference on High Performance Computing* ('99) (co-sponsored by IEEE), *International Conference on Advanced Computing and Communications* ('00, '01) (co-sponsored by IEEE), *Asia and South Pacific Design Automation Conference* ('02) (co-sponsored by IEEE).

## Research Publications:

## Articles in Journals :

1. B. B. Bhattacharya, and S. Das (2010): *On the minimum size of a point set containing a 4-Hole and a disjoint 5-Hole*, *Studia Scientarium Mathematica Hungarica*, (in press).
2. B. B. Bhattacharya, and S. Das (2010): *Geometric proof of a Ramsey-type result for disjoint empty convex polygon -I*, *Geombinatorics*, vol. XIX (4), pp. 146-155.
3. B. B. Bhattacharya, and S. Das (2010): *Geometric proof of a Ramsey-type result for disjoint empty convex polygon -II*, *Geombinatorics*, vol. XX (1).
4. S. Das, P. P. Goswami and S. C. Nandy (2009): *Smallest color-spanning object revisited*, *International Journal of Computational Geometry and Applications(IJCGA)*, vol. 19(5), pp. 457-478.
5. D. Bardhan, S. Roy and S. Das (2009): *Optimal guard placement problem under L-visibility*, *International Journal of Computational Geometry and Applications*, vol. 19(4), pp. 357-370.
6. M. Ahmed, S. Das, S. Lodha, A. Lubiw, A. Maheshwari and S. Roy (2010): *Approximation algorithms for shortest descending paths in terrains*, *Journal of Discrete Algorithms*, vol. 8(2), pp. 214-230.
7. P. Banerjee, S. Sur-Kolay, A. Bishnu, S. Das, S. C. Nandy and S. Bhattacharjee (2009): *FPGA Placement using Space Filling Curves: Theory Meets Practice*, *Special issue on Configuring Algorithms, Processes and Architecture (CAPA) in ACM Trans. on Embedded Computing Systems*, vol. 9(2), article 12, pp. 1-23.
8. G. K. Das, S. Das and S. C. Nandy (2009): *Homogeneous 2-hop broadcast in 2D*, *Computational Geometry*, vol. 43(2), pp. 182-190.
9. C. Saha and S. Das (2009): *Covering a set of points in a plane using two parallel rectangles*, *Information Processing Letters*, vol. 109(16), pp. 907-912.
10. S. Roy, A. Karmakar, S. Das and S. C. Nandy (2009), *Constrained minimum enclosing circle with center on a query line segment*, *Computational Geometry: Theory and Applications*, vol. 42(6-7), pp. 632-638.
11. R. Benkoczi, B. K. Bhattacharya, S. Das and J. Sember (2009), *Single facility collection depots location problem in the plane*, *Computational Geometry: Theory and Applications*, vol. 42(5), pp. 403-418.
12. S. Roy, S. Bhattacharjee, S. Das and S. C. Nandy (2009): *A new fast heuristic for labeling points*, *Information Processing Letters*, vol. 109(10), pp. 478-484.
13. A. Karmakar, S. Roy and S. Das (2008): *Fast computation of smallest enclosing circle with center on a query line segment*, *Information Processing Letters*, vol. 108(6), pp. 343-346.

14. S. Roy, D. Bardhan, and S. Das (2008): *Base station placement on boundary of a convex polygon*, *Journal of Parallel and Distributed Computing*, vol. 68(2), pp. 265-273.
15. G. K. Das, S. Roy, S. Das and S. C. Nandy (2008): *Variations of base station placement problem on the boundary of a convex region*, *International Journal of Foundations of Computer Science*, vol. 19(2), pp. 405-427.
16. S. Roy, S. Das, and S. C. Nandy (2007): *Shortest monotone descent path problem in polyhedral terrain*, *Computational Geometry: Theory and Applications*, vol. 37(2), pp. 115-133.
17. P. P. Goswami, S. Das and S. C. Nandy (2007): *Chromatic distribution of  $k$ -nearest neighbors of a line segment in a planar colored point set*, *Information Processing Letters*, vol. 102(4), pp. 163-168.
18. G. K. Das, S. Das, S. C. Nandy and B. P. Sinha (2006): *Efficient Algorithm for Placing a Given Number of Base Stations to Cover a Convex Region*, *Journal of Parallel and Distributed Computing*, vol. 66, pp. 1353-1358.
19. A. Bishnu, S. Das, S. C. Nandy and B. B. Bhattacharya (2006): *Simple algorithms for partial point set pattern matching under rigid motion*, *Pattern Recognition*, vol. 39, pp. 1662-1671.
20. M. Sen, P. Talukdar, and S. Das (2006): *Chronological orderings of interval digraph*, *Discrete Mathematics*, vol. 306, No. 11, pp. 1601-1609.
21. G. K. Das, S. Das and S. C. Nandy(2006): *Range assignment for energy efficient broadcasting in linear radio networks*, *Theoretical Computer Science*, vol. 352, pp. 332-341.
22. S. Das, P. P. Goswami and S. C. Nandy (2005): *Smallest  $k$ -point enclosing rectangle and square of arbitrary orientation*, *Information Processing Letters*, vol. 94(6), pp. 259-266.
23. S. Das, S. Sur-Kolay, and B. B. Bhattacharya (2004): *Algorithms for Manhattan-Diagonal Routing :Channels, L-Shaped Channels, Switchboxes and Staircases* , *ACM Transactions on Design Automation of Electronic Systems* vol. 9(1), pp. 75-104.
24. P. P. Goswami, S. Das and S. C. Nandy (2004): *Triangular Range Counting Query in 2D and its Application in Finding  $k$  Nearest Neighbors of a Line Segment*, *Computational Geometry: Theory and Applications*, vol 29(3), pp. 163-175.
25. S. Roy, P. P. Goswami, S. Das, and S. C. Nandy (2004): *Optimal Algorithm for a Special Point-labeling Problem*, *Information Processing Letters*, vol. 89(2), Pages 53-103.
26. S. C. Nandy, S. Das, and P. P. Goswami (2003): *An efficient  $K$  nearest neighbor searching algorithm for a query line*, *Theoretical Computer Science*, vol. 1-3(299), pp. 273-288.
27. J. Chaudhuri, S. C. Nandy, and S. Das (2003): *Largest empty rectangle among a point set*, *Journal of algorithms*, vol. 46, pp. 54-78.

28. S. Chakraborty, S. Das, D. Das, and B. B. Bhattacharya (2000): *Synthesis of symmetric functions for path-delay fault testability*, IEEE Transaction on Computer-Aided Design, vol. 19, pp. 1076-1081.

#### Articles in Electronic Notes :

29. S. Das, P. Talukdar, and M. Sen (2003): *Homogeneously representable interval bi-graphs*, Proceedings of R.C. Bose Centenary Symposium on Discrete Mathematics and Applications in Electronic Notes in Discrete Mathematics Vol. 15, pp 77-80.
30. M. Sen, P. Talukdar, and S. Das (2003): *Chronological orderings of interval digraph*, Proceedings of R.C. Bose Centenary Symposium on Discrete Mathematics and Applications in Electronic Notes in Discrete Mathematics Vol. 15, pp 184-187.

#### Articles in Conference Proceedings

31. A. Bishnu, S. Das, S. C. Nandy, B. B. Bhattacharya (2010): *A Simple Algorithm for Approximate Partial Point Set Pattern Matching under Rigid Motion*, Workshop on Algorithms and Computation, haka, Bangladesh, LNCS 5942, pp. 102-112
32. B. K. Bhattacharya, A. Bishnu, O. Cheong, S. Das, A. Karmakar, J. Snoeyink (2010): *Computation of Non-dominated Points Using Compact Voronoi Diagrams*. Workshop on Algorithms and Computation, haka, Bangladesh, LNCS 5942, pp. 82-93.
33. P. R. Sinha Mahapatra, P. P. Goswami and S. Das (2008): *Maximal Covering by Two Isothetic Unit Squares*, Proc. of the 20th Annual Canadian Conference on Computational Geometry, at McGill University in Montreal, Canada, pp. 103-106.
34. A. Karmakar, S. Roy, S. Das (2008): *Guarding Exterior Region of a Simple Polygon*, Workshop on Algorithms and Computation, Dhaka, Bangladesh, LNCS 4921, pp. 100-110.
35. P. R. Sinha Mahapatra, P. P. Goswami and S. Das (2007): *Covering points by isothetic unit squares*, Proc. of the 19th Annual Canadian Conference on Computational Geometry, Ottawa, Canada, pp. 169-172.
36. S. Roy, S. Lodha, S. Das and A. Maheshwari (2007): *Approximate shortest descent path on a terrain*, Proc. of the 19th Annual Canadian Conference on Computational Geometry, Ottawa, Canada, pp. 189-192.
37. A. Karmakar, S. Roy and S. Das (2007): *Fast computation of smallest enclosing circle with center on a query line segment*, Proc. of the 19th Annual Canadian Conference on Computational Geometry, Ottawa, Canada, pp. 273-276.
38. B. Ben-Moshe, B. K. Bhattacharya, S. Das, D. R. Gaur and Q. Shi (2007): *Computing a planar widest empty alpha-siphon in  $o(n^3)$  time*, Proc. of the 19th Annual Canadian Conference on Computational Geometry, Ottawa, Canada, pp. 33-36.
39. C. Saha and S. Das (2007): *Covering a set of points in a plane using two parallel rectangles*, International Conference on Computing: Theory and Applications (ICCTA 2007), Kolkata, India, IEEE Computer Society, pp. 214-218.

40. G. K. Das, S. Roy, S. Das and S. C. Nandy (2007): *Base station placement problem on the boundary of a convex region*, Workshop on Algorithms and Computation, Dhaka, Bangladesh, pp. 151-152.
41. S. Roy, A. Karmakar, S. Das and S. C. Nandy (2006): *Constrained minimum enclosing circle with center on a query line segment*, accepted in 31st International Symposium on Mathematical Foundations of Computer Science, LNCS 4162 pp. 765-776.
42. D. Bardhan, S. Roy and S. Das (2006): *Optimal Guard Placement problem under L-visibility*, Computational Geometry and Applications (in conjunction with The 2006 Int. Conf. on Computational Science and its Applications), LNCS 3980 Part II, pp. 10-19.
43. G. K. Das, S. Das and S. C. Nandy (2006): *Homogeneous 2-Hops broadcast in 2D*, The 2006 Int. Conf. on Computational Science and its Applications, LNCS 3980 Part II, pp. 750-759.
44. G. K. Das, S. Das and S. C. Nandy and B. P. Sinha (2005): *Placing a given number of base stations to cover a convex region*, The 7th International Workshop on Distributed Computing (IWDC -2005), LNCS-3741, pp. 57-62.
45. P. Banarjee, S. Bhattacharjee, S. Sur-Kolay, S. Das and S. C. Nandy (2005): *Fast FPGA placement using space-filling curves*, Proc. of the 15th Int. Conf. on Field-programmable Logic and Applications, IEEE CS Press, Tampere, Finland, pp. 415-420.
46. S. Roy, S. Bhattacharjee, S. Das and S. C. Nandy (2005): *A fast algorithm for point labeling problem*, 17th. Canadian Conference on Computational Geometry, Windsor, Canada, pp. 155-158.
47. R. Benkoczi, B. K. Bhattacharya, S. Das and J. Sember (2005): *Collection depot location problem in the plane*, 17th. Canadian Conference on Computational Geometry, Windsor, Canada, pp. 76-79.
48. S. Roy, D. Bardhan and S. Das (2005): *Efficient Algorithm for placing base stations by avoiding forbidden zone*, Distributed Computing and Internet Technology, LNCS 3816, pp. 105-116.
49. S. Das, P. P. Goswami and S. C. Nandy (2005): *Recognition of minimum width color-spanning corridor and minimum area color-spanning rectangle*, Computational Geometry and Applications (in conjunction with The 2005 Int. Conf. on Computational Science and its Applications), Singapore, LNCS 3483, pp. 827-837.
50. S. Roy, S. Das and S. C. Nandy (2005): *Shortest monotone descent path problem in polyhedral terrain*, Proc. 22nd Annual Symposium on Theoretical Aspects of Computer Science, Stuttgart, Germany, LNCS 3404, pp. 281-292.
51. G. Das, S. Das, and S. C. Nandy (2004): *Efficient algorithms for energy efficient broadcasting in linear radio network*, Proc. International Conference on High Performance Computing (HiPC 2004), Bangalore, India, LNCS 3296, pp. 420-429.

52. S. Roy, S. Das, and S. C. Nandy (2004) *A practical algorithm for approximating shortest weighted path between a pair of points on polyhedral surface*, in Proc. Computational Geometry and Applications (in conjunction with The 2004 Int. Conf. on Computational Science and its Applications), Italy, LNCS 3045, pp. 42-52.
53. P. P. Goswami, S. Das, and S. C. Nandy (2004): *Smallest  $k$  point enclosing rectangle of arbitrary orientation*, Proc. of the 16th Canadian Conference on Computational Geometry, Montreal, Canada, pp. 116-119.
54. A. Bishnu, S. Das, S. C. Nandy, and B. B. Bhattacharya (2003): *An Improved Algorithm for Point Set Pattern Matching under Rigid Motion*, 5th. Italian Conference on Algorithms and Complexity, Italy, LNCS-2653, pp. 36-45.
55. S. Roy, P. P. Goswami, S. Das, and S. C. Nandy (2002): *Optimal Algorithm for a Special Point-labeling Problem*, Proc. Scandinavian Workshop on Algorithmic Theory (SWAT - 2002), Finland, LNCS - 2368, pp. 110-120, 2002.
56. P. P. Goswami, S. Das, and S. C. Nandy (2002): *Simplex range searching and  $k$  nearest neighbors of a line segment in  $2D$* , Proc. Scandinavian Workshop on Algorithmic Theory (SWAT - 2002), Finland, LNCS - 2368, pp. 69-79, 2002.
57. S. Das, S. C. Nandy, and B. B. Bhattacharya (1999): *High performance MCM routing: a new approach*, in Proc. of 12th International Conference on VLSI Design, IEEE CS Press. pp. 564-569.
58. S. Chakraborty, S. Das, D. Das, and B. B. Bhattacharya (1999): *Synthesis of symmetric functions for path-delay fault testability*, in IEEE Transaction on Computer-Aided Design, in Proc. of 12th International Conference on VLSI Design, IEEE CS Press. pp. 512-517.
59. S. Das, S. Sur-Kolay, and B. B. Bhattacharya (1998): *Routing of L-shaped channels, switchboxes, and staircases in manhattan diagonal model* in Proc. 11th International Conference on VLSI Design, IEEE CS Press. pp. 65-70.
60. S. Das, and B. B. Bhattacharya (1996): *Channel routing in manhattan-diagonal model*, in Proc. International Conference on VLSI Design, IEEE CS Press. pp. 43-48.
61. S. Das, and B. B. Bhattacharya (1993): *Via minimization in channel routing by layout modification*, in Proc. 6th International Conference on VLSI Design, IEEE CS Press. pp. 109.
62. S. Das, S. C. Nandy, and B. B. Bhattacharya (1991): *An Improved heuristic algorithm for over-the-cell channel routing*, in Proc. International Symposium on Circuits and Systems (ISCAS), IEEE CS Press. pp. 3106-3109.

#### **List of patents applied for**

- 1 T. Acharya, B. B. Bhattacharya, P. Bhowmick, A. Bishnu, A. Biswas, S. Das, M. K. Kundu, C. A. Murthy, and S. C. Nandy, "Fingerprint minutiae matching using geometric techniques", United States Patent 7,359,532, April 15, 2008.