Curriculum Vitae

Surender Baswana

Associate Professor
Department of Computer Science & Engineering,
Indian Institute of Technology Kanpur,
Kanpur - 208016, U.P., INDIA.
+91-512-259-6074   Email: sbaswana AT cse.iitk.ac.in
Fax +91-512-259-0725   Web: http://www.cse.iitk.ac.in/~sbaswana

Research Interest

Design and analysis of computer algorithms, especially, Graph algorithms, Dynamic algorithms, Streaming algorithms, Randomized algorithms.

Education

Indian Institute of Technology Delhi, Department of Computer Science, B. Tech 1997; M. Tech 1999; PhD October 2003.

Employment

Associate Professor (December 2010 - present)	Deptt. of Comp. Sc. & Engg., I.I.T. Kanpur.
Assistant Professor (July 2006-November 2010)	Deptt. of Comp. Sc. & Engg., I.I.T. Kanpur.
Postdoctoral Researcher	(October 2003- June 2006) Max. Planck Institute of Computer Science Algorithms & Complexity group, Saarbruecken, Germany.

Refereed Journal Articles

J1. S. Baswana and N. Khanna. Approximate shortest paths avoiding a failed vertex: Near optimal data structures for undirected unweighted graphs. *Algorithmica* 66(1), 18-50, 2013.

J2. S. Baswana, S. Khurana, and S. Sarkar. Fully Dynamic Algorithms for Graph Spanners. *ACM Transactions on Algorithms* 8(4):35, 2012.

J3. S. Baswana and T. Kavitha. Faster Algorithms for All-Pairs Approximate Shortest Paths in Undirected Graphs. *SIAM Journal of Computing* 39(7), 2865-2896, 2010.

J4. S. Baswana and T. Kavitha, K. Mehlhorn, and S. Pettie. Additive Spanners and (α, β)-Spanners. *ACM Transactions on Algorithms* 7(1): 5, 2010.

J5. S. Baswana and V.Goyal and S. Sen. All-Pairs Nearly 2-Approximate Shortest Paths in $O(n^2 \, \text{polylog} \, n)$ time. *Theoretical Computer Science* 410, 84-93, 2009.

J6. S. Baswana. Streaming algorithm for graph spanners - single pass and constant processing time per edge. *Information Processing Letters* 106(3), 110-114, 2008.

J7. S. Baswana and S. Sen. A Simple Linear Time Randomized Algorithm for Computing Sparse Spanners in Weighted Graphs. *Random Structures and Algorithms* 30(4), 532-563, 2007.

J8. S. Baswana and R. Hariharan and S. Sen. Improved Decremental Algorithms for Maintaining Transitive Closure and All-pairs Shortest Paths in Digraphs. *Journal of Algorithms* 62(2), 74-92, 2007.

J9. S. Baswana and S. Sen. Approximate Distance Oracles for Unweighted graphs in $O(n^2)$ time. *ACM Transactions on Algorithms* 2(4), 557-577, 2006.

J10. S. Baswana and S. Sen. Planar Graph Blocking for External Searching. *Algorithmica* 34, 298-308, 2002.

Refereed Conference Proceedings

C1. S. Baswana and S. Khan. Incremental algorithm for maintaining DFS tree for undirected graph. *Proc. 41st International Colloquium on Automata, Languages and Programming (ICALP)*, Springer-Verlag, Lecture Notes in Computer Science, volume 8572, 136-149, 2014.

C2. R. Chouhan, S. Roy, S. Baswana: Pertinent path profiling: Tracking interactions among relevant statements. *Proc. of the 2013 IEEE/ACM International Symposium on Code Generation and Optimization, (CGO)* , 1-12, 2013.

C3. S. Baswana, U. Lath, and A. Mehta. Single source distance oracle for planar digraphs avoiding any failed node or link. *Proc. 23rd ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 223-232, 2012.

C4. A. Anand, S. Baswana, M. Gupta, and S. Sen. Maintaining approximate maximum weighted matching in fully dynamic graphs. *Proc. 32nd Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 257-266, 2012.

C5. S. Baswana, M. Gupta, and S. Sen. Fully dynamic maximal matching in $O(\log n)$ update time. *Proc. 52nd IEEE Symposium on Foundations of Computer Science (FOCS)*, 383-392, 2011.

C6. N. Khanna and S. Baswana. Approximate shortest paths under single vertex failure : Optimal size data structures for unweighted graphs. *Proc. 27th International Symposium on Theoretical Aspects of Computer Science (STACS)*, 513-524, 2010.

C7. S. Baswana, S. Biswas, B. Doerr, T. Friedrich, P.P. Kurur, and F. Neumann. Computing Single Source Shortest Paths using Single-Objective Fitness Functions. *Proc. 10th ACM Symposium on Foundations of Genetic Algorithms*, Orlando, Florida, USA, January 9-11, 2009.

C8. S. Baswana, A. Gaur, S. Sen, and J. Upadhyay. Distance oracles for unweighted graphs : breaking the quadratic barrier with constant additive error. *Proc. 35th International Colloquium on Automata, Languages and Programming (ICALP)*, Springer-Verlag, Lecture Notes in Computer Science, volume 5125, 609-621, 2008.

C9. S. Baswana and S. Sarkar. Fully Dynamic Polylogarithmic Algorithms for Graph Spanners. *Proc. 19th Symposium on Discrete Algorithms (SODA)*, 672-681. ACM and SIAM, 2008.

C10. S. Baswana, S. Mehta and V. Powar. Implied Set Closure and Its Application to Memory Consistency Verification. *Proc. 20th International Conference on Computer Aided Verification (CAV)*, Springer-Verlag, Lecture Notes in Computer Science, volume 5123, 94-106, 2008.

C11. S. Baswana and T. Kavitha. Faster Construction of Approximate Distance Oracles and All-Pairs Small Stretch Paths. *Proc. 47th Symposium on Foundations of Computer Science (FOCS)*, 591-602. IEEE, 2006.

C12. S. Baswana. Dynamic Algorithms for Graph Spanners. *Proc. 14th European Symposium on Algorithms (ESA)*, Springer-Verlag, Lecture Notes in Computer Science, volume 4168, 76-87, 2006.

C13. S. Baswana, T. Kavitha, K. Mehlhorn, and S. Pettie. New Constructions of (α, β)-Spanners and Purely Additive Spanners. *Proc. 16th Symposium on Discrete Algorithms (SODA)*, 672-681. ACM and SIAM, 2005.

C14. S. Baswana, V. Goyal, and S. Sen. All-pairs nearly 2-approximate shortest paths in $O(n^2 polylogn)$ time. *Proc. 22nd International Symposium on Theoretical Aspects of Computer Science (STACS)*, Springer-Verlag, Lecture Notes in Computer Science, volume 3404, 666-679, 2005. This paper was **among the selected best papers** of the conference and was invited for publication in a special issue of the journal *Theory of Computing Systems.*

C15. S. Baswana and S. Sen. Approximate Distance Oracles for Unweighted graphs in $O(n^2 logn)$ time. *Proc. 15th Symposium on Discrete Algorithms (SODA)*, 264-273, ACM and SIAM, 2004. This paper was **among the selected best papers** of the conference and was invited for publication in a special issue of the journal *ACM Transaction on Algorithms.*

C16. S. Baswana and S. Sen. A Simple Linear Time Algorithm for Computing (2k-1)-Spanners of size $O(kn^{1+1/k})$ in Weighted Graphs. *Proc. 30th International Colloquium on Automata, Languages and Programming (ICALP)*, Springer-Verlag, Lecture Notes in Computer Science, volume 2719, 384-396, 2003. This paper was **among the selected best papers** of the conference and was invited for publication in a special issue of the journal *Theoretical Computer Science.*

C17. S. Baswana, R. Hariharan, and S. Sen. Maintaining All-Pairs Approximate Shortest Paths Under Deletion of Edges. *Proc. 14th Symposium on Discrete Algorithms (SODA)*, 394-403. ACM and SIAM, 2003.

C18. S. Baswana, R. Hariharan, and S. Sen. Improved Decremental Algorithms for Maintaining Transitive Closure and All-pairs Shortest Paths in Digraphs. *Proc. 34th ACM Symposium on Theory of Computing (STOC)*, 117-123, ACM, 2002.

C19. S. Baswana and S. Sen. Planar Graph Blocking for External Searching. *Proc. 20th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, Springer-Verlag, Lecture Notes in Computer Science 1974, 252-263, 2000.

Book Chapters

B1. S. Baswana and S. Sen. Randomized graph data-structures for approximate shortest path problem. Handbook of Data Structures and Applications, ISBN 1584884355. Dinesh Mehta and Sartaj Sahni (Ed.), CRC Press, 2004.

B2. S. Baswana and S. Sen. Simple Algorithms for Spanners in Weighted Graphs. Encyclopedia of Algorithms. Ming Yang Kao (Ed.), Springer, 2008.

Awards and Achievements

Research:

- *Programme Committee member   FSTTCS 2012*
  Served as a PC member for 32nd Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS) to be held from December 15-17, 2012 at Hyderabad, India.

- *Young Engineer Award*
  Received Young Engineer Award from Indian National Academy of Engineering for the year 2009.

- *Programme Committee member   ICALP 2005*
  Served as a PC member (Algorithms track) for 32nd International Colloquium on Automata, Languages and Programming (ICALP) held on July 11-15, 2005 at Lisboa, Portugal.

- *Outstanding Ph.D. Dissertation Award*
  Received Outstanding Ph.D. Dissertation Award by IBM India Research Lab in 2005.

- *Award for commendable research*
  Received award for commendable research work in Inter Research Institute Students Seminar (IRISS) held in I.I.T. Delhi, March 28-29, 2003.

Teaching :

- *Gopal Das Bhandari Memorial Distinguished Teacher award* by the entire graduating batch of IIT Kanpur for the year 2010.

- *Best Faculty Award* by the graduating batch of department of CSE, IIT Kanpur for the year 2009-10.

- *Best Faculty Award* by the graduating batch of department of CSE, IIT Kanpur for the year 2010-11.

- *Best Faculty Award* by the graduating batch of department of CSE, IIT Kanpur for the year 2011-12.

- *Best Faculty Award* by the graduating batch of department of CSE, IIT Kanpur for the year 2012-13.

- Received letter of appreciation from Director IIT Kanpur for extra ordinary performance as instructor in the following courses.

Course No.	Course Name	Semester	No. of Students
CS345	Design and Analysis of Algorithms	II, 2006-07	68
ESO211	Data Structures and Algorithms	I, 2007-08	110
CS648	Randomized Algorithms	II, 2007-08	37
CS345	Design and Analysis of Algorithms	II, 2008-09	70
CS648	Randomized Algorithms	I, 2009-10	45
CS201	Discrete Mathematics	II, 2009-10	65
CS648	Randomized Algorithms	I, 2010-11	60
CS201	Discrete Mathematics	II, 2010-11	77
CS648	Randomized Algorithms	I, 2011-12	55
CS601	Algorithms for Computer Science	I, 2011-12	42
CS345	Design and Analysis of Algorithms	II, 2011-12	90
CS210	Data Structures and Algorithms	I, 2012-13	145

The evaluation of a course is based on the students reaction survey conducted at the end of the course. An instructor receives the letter of appreciation from Director if he receives at least 3.5/4 points in the survey for the course.

Personal Data
Date of Birth : August 26, 1974
Nationality : Indian
Sex : Male
Marital Status : Married