

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed on Form Page 2.  
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>Robins, Gabriel</b>	POSITION TITLE Professor of Computer Science Department of Computer Science, UVA
--------------------------------	--

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
UCLA, Los Angeles, CA	B.S.	1983	Math & Computer Science
Princeton University, Princeton, NJ	M.S.E.	1985	Computer Science
UCLA, Los Angeles, CA	Ph.D.	1992	Computer Science

**A. Positions, Employment and Honors**

1985-1989 Researcher, USC Information Sciences Institute, Marina Del Rey, CA  
 1989-1992 Research Associate, UCLA  
 1992-1996 Assistant Professor, Department of Computer Science, University of Virginia  
 1996-1997 Associate Professor (tenured), Department of Computer Science, University of Virginia  
 1997-2002 Walter N. Munster (Endowed Chair) Associate Professor of Computer Science (tenured), UVA  
 2002-Present Professor (tenured), Department of Computer Science, University of Virginia

**Professional Memberships**

1985-Present Association for Computing Machinery (ACM)  
 1985-Present Institute of Electrical and Electronics Engineering (IEEE)  
 1985-Present ACM Special Interest Group on Design Automation (SIGDA)  
 1985-Present ACM Special Interest Group on Automata and Comp. Theory (SIGACT)

**Honors and Awards**

2007 **Outstanding Paper Prize**, Society for Industrial and Applied Mathematics (SIAM)  
 1995-2001 **Packard Foundation Fellowship** (\$550,000) (first one ever awarded in the state of Virginia)  
 1994-1999 **National Science Foundation Young Investigator Award** (NSF NYI) (\$312,500)  
 1998-2001 Member of the U.S. Army Science Board, U.S. Department of Defense  
 1994-1995 Member of the Defense Science Study Group, U.S. Department of Defense  
 1996-1997 Member of the Navy Future Study (National Academy of Sciences)  
 1997-2002 Walter N. Munster Endowed Chair, University of Virginia  
 1999-2002 Member of the Faculty Senate, University of Virginia  
 1999-2002 Member of the Faculty Council, School of Engineering, University of Virginia  
 2000-2004 Associate Editor, IEEE Transactions on Very Large Scale Integration (VLSI) Systems  
 2007- Member of the Editorial Board, Research Letters in Electronics  
 1996- Expert Witness in several major intellectual property (IP) civil and criminal litigations  
 1997- Member of the Editorial Board, IEEE Book Series  
 1996 Two-year early promotion to Associate Professor (with tenure)  
 1993 NSF Research Initiation Award, U.S. National Science Foundation  
 1994 All-University Outstanding Teaching Award, University of Virginia  
 1995 University Teaching Fellowship, University of Virginia  
 1998 Faculty Mentor Award, School of Engineering, University of Virginia  
 1998 Faculty Appreciation Award, Virginia Engineering Foundation  
 2001 Web Team Award, Department of Computer Science, University of Virginia  
 1990 Distinguished Paper Award, IEEE International Conference on Computer-Aided Design  
 1989 Distinguished Teaching Award, University of California, Los Angeles  
 1991 IBM Graduate Fellowship, University of California, Los Angeles & IBM Corp.  
 1996 General Chair of the ACM Physical Design Workshop  
 1997 Founder of the ACM International Symposium on Physical Design

**Other:** 21 invited talks and presentations; 32 newspaper and magazine articles; 2 patent apps  
Directed 19 graduate students, 24 undergraduates, and 2 postdocs.  
Refereed for 34 journals, conferences, publishers, and government agencies.

## B. Selected peer-reviewed publications:

**Note: my publication policy is to always order co-author names alphabetically.**

1. Robins, G., The ISI Grapher: a Portable Tool for Displaying Graphs Pictorially, Multicomputer Vision, Levaldi, S., Chapter 12, Academic Press, London, 1988, pp. 185-202.
2. Kahng, A. B. and Robins, G., On Optimal Interconnections for VLSI, Kluwer Academic Publishers, Boston, MA, 1995.
3. Robins, G. and Zelikovsky, A. Minimum Steiner Tree Construction, in The Handbook of Algorithms for VLSI Physical Design Automation, Alpert, Mehta, and Sapatnekar (editors), CRC Press, 2009, Chapter 24, pp. 487-508.
4. Hu, J., Robins, G, and Sze C. N., Timing-Driven Interconnect Synthesis, in The Handbook of Algorithms for VLSI Physical Design Automation, Alpert, Mehta, and Sapatnekar (editors), CRC Press, 2009, Chapter 25, pp. 509-534.
5. Bolotnyy, L, and Robins, G., Multi-tag RFID systems, in the book "Security in RFID and Sensor Networks", Auerbach Publications, CRC Press, Taylor & Francis Group, 2009.
6. Bolotnyy, L, and Robins, G., Physical Privacy and Security in RFID Systems, in the book "Security in RFID and Sensor Networks", Auerbach Publications, CRC Press, Taylor & Francis Group, 2009.
7. Bolotnyy, L, and Robins, G., "Generalized and Inter-Tag Communication", in the book "Development and Implementation of RFID Technology", In-Tech Publishers, Vienna, Austria, 2009.
8. Kahng, A. B., and Robins, G., Optimal Algorithms for Extracting Spatial Regularity in Images, Pattern Recognition Letters, 12, December 1991, pp. 757-764.
9. Cong, J., Kahng A. B., Robins, G., Sarrafzadeh, M., and Wong, C. K., Provably-Good Performance-Driven Global Routing, IEEE Transactions on Computer-Aided Design, Vol. 11, No. 6, June 1992, pp. 739-752.
10. Kahng, A. B., and Robins, G., A New Class of Iterative Steiner Tree Heuristics With Good Performance, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 11, No. 7, July 1992, pp. 893-902.
11. Hu, T. C., Kahng, A. B., and Robins, G., Solution of the Discrete Plateau Problem, Proceedings of the National Academy of Sciences, Vol. 89, October 1992, pp. 9235-9236.
12. Kahng, A. B., and Robins, G., On Performance Bounds for a Class of Rectilinear Steiner Tree Heuristics in Arbitrary Dimension, IEEE Transactions on Computer-Aided Design, Vol. 11, No. 11, November 1992, pp. 1462-1465.
13. Cong, J., Kahng A. B., and Robins, G., Matching-Based Methods for High-Performance Clock Routing, IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems, Vol. 12, No. 8, August 1993, pp. 1157-1169.
14. Hu, T. C., Kahng, A. B., and Robins, G., Optimal Robust Path Planning in General Environments, IEEE Transactions on Robotics and Automation, Vol. 9, No. 6, December 1993, pp. 775-784.
15. Alpert, C., Cong, J., Kahng, A. B., Robins, G., and M. Sarrafzadeh, On the Minimum Density Interconnection Tree Problem, VLSI Design: an International Journal, Vol. 2, No. 2, February 1994, pp. 157-169.
16. Boese, K., Kahng, A. B., McCoy, B. A., and Robins, G., Near-Optimal Critical Sink Routing Tree Constructions, IEEE Transactions on Computer-Aided Design, Vol. 14, No. 12, December 1995, pp. 1417-1436.
17. Griffith, J., Robins, G., Salowe, J. S., and Zhang, T., Closing the Gap: Near-Optimal Steiner Trees in Polynomial Time, IEEE Trans. on Comp.-Aided Design of Integrated Circuits and Sys., Vol. 13, No. 11, Nov 1994, pp. 1351-1365.
18. Robins, G., and Salowe, J. S., Low-Degree Minimum Spanning Trees, Discrete and Computational Geometry, Vol. 14, September 1995, pp. 151-165.
19. McCoy, B. A., and Robins, G., Non-Tree Routing, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 14, No. 6, June 1995, pp. 780-784.
20. Kahng, A. B., Robins, G., and Walkup, E. A., Optimal Algorithms for Substrate Testing in Multi-Chip Modules, International Journal on High-Speed Electronics and Systems, Vol. 6, No. 4, December 1995, pp 595-612.
21. Alexander, M. J., Cohoon, J. P., Ganley, J. L., Robins, G., Placement and Routing for Performance-Oriented FPGA Layout, VLSI Design: an International Journal of Custom-Chip Design, Simulation, and Testing, Vol. 7, No. 1, 1998.
22. Alexander, M. J., and Robins, G., New Performance-Driven FPGA Routing Algorithms, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 15, No. 12, December 1996, pp. 1505-1517.
23. Kahng, A. B., Robins, G., and Walkup, E. A., How to Test a Tree, Networks, 32, 1998, pp. 189-197.
24. Pearson, W. R., Robins, G., Wrege, D. E., and Zhang, T., **On the Primer Selection Problem for Polymerase Chain Reaction Experiments**, Discrete and Applied Mathematics, Vol. 71, 1996, pp. 231-246.
25. Pearson, W. R., Robins, G., and Zhang, T., **Generalized Neighbor-Joining: More Reliable Phylogenetic Tree Reconstruction**, Journal of Molecular Biology and Evolution, Vol. 16, No. 6, pp. 806-816, 1999.
26. Kahng, A. B., Robins, G., Singh, A., and Zelikovsky, A., Filling Algorithms and Analyses for Layout Density Control, IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems, Vol. 18, No. 4, April 1999, pp. 445-462.
27. Robins, G., Robinson, B. L., and Sethi, B. S., On Detecting Spatial Regularity in Noisy Images, Information Processing Letters, No. 69, 1999, pp. 189-195.
28. Helvig, C. S., Robins, G., and Zelikovsky, A., New Approximation Algorithms for Routing with Multi-Port Terminals, IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems, Vol 19, No. 10, Oct 2000, pp. 1118-1128.
29. Helvig, C. S., Robins, G., and Zelikovsky, A., An Improved Approximation Scheme for the Group Steiner Problem, Networks, Vol. 37, No. 1, January 2001, pp. 8-20.

30. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Area Fill Synthesis for Uniform Layout Density, IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems, Vol. 21, No. 10, October, 2002, pp. 1132-1147.
31. Helvig, C. S., Robins, G., and Zelikovsky, A., The Moving-Target Traveling Salesman Problem, Journal of Algorithms, Vol. 49, No. 1, October 2003, pp. 153-174.
32. Robins, G. and Zelikovsky, A., Tighter Bounds for Graph Steiner Tree Approximation, SIAM Journal on Discrete Mathematics, Vol. 19, No. 1, 2005, pp. 122-134. This paper won the SIAM Outstanding Paper Prize in 2007
33. Chen, Y., Kahng, A. B., Robins, G., Zelikovsky, A., and Zheng, Y., Compressible Area Fill Synthesis, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 24, No. 8, pp. 1169-1187, 2005.
34. ..., Dutta, A., Kamani, N., Taylor, C. M., Kim, H. K., Robins, G., et al., **The Encode (Encyclopedia of DNA Elements) Project**, Science, Vol 306, No. 5696, October 2004, pp. 636-640.
35. Chen, Y., Kahng, A. B., Robins, G., Zelikovsky, A., and Zheng, Y., Closing the Smoothness and Uniformity Gap in Area Fill Synthesis, to appear in ACM Transactions on Design Automation of Electronic Systems.
36. Bolotnyy, L. and Robins, G., Multi-Tag RFID Systems, International Journal of Internet Protocol Technology, special issue on RFID: Technologies, Applications, and Trends, Vol 2, No 3/4, December, 2007, pp. 218-231. Invited paper
37. Kaczmarek, T., Bates, R., and Robins, G., Recent Developments in NIKL, American Association of Artificial Intelligence, Proc. Fifth National Conf. on Artificial Intelligence, Philadelphia, Pennsylvania, August 1986, pp. 978-985.
38. Robins, G., The ISI Grapher: a Portable Tool for Displaying Graphs Pictorially, Proc. Symbolikka '87, Helsinki, Finland, August 17-18, 1987, pp. 44-60.
39. Robins, G., Applications of The ISI Grapher, Proc. Fourth Annual Artificial Intelligence and Advanced Computer Conference, Long Beach, California, May 1988, pp. 105-130.
40. Kahng, A. B., and Robins, G., A New Family of Steiner Tree Heuristics with Good Performance: The Iterated 1-Steiner Approach, Proc. IEEE Intl Conf. n Computer-Aided Design, 1990, pp. 428-431. **Won a Distinguished Paper Award.**
41. Kahng, A. B., Cong, J., and Robins, G., High-Performance Clock Routing Based on Recursive Geometric Matching, Proc. ACM/IEEE Design Automation Conference, San Francisco, June 1991, pp. 322-327.
42. Kahng, A. B., and Robins, G., Optimal Algorithms for Determining Regularity in Pointsets, Proc. Canadian Conference on Computational Geometry, Vancouver, August 1991, pp. 167-170.
43. Cong, J., Kahng, A. B., and Robins, G., On Clock Routing For General Cell Layouts, Proc. IEEE International ASIC Conference, Rochester, September 1991, pp. P14:5.1-P14:5.4.
44. Kahng, A. B., Robins, G. and Walkup, E. A., New Results and Algorithms for MCM Substrate Testing, Proc. IEEE International Symposium on Circuits and Systems, San Diego, May 1992, pp. 1113-1116.
45. Alpert, C., Cong, J., Kahng, A. B., Robins, G., and Sarrafzadeh, M., Minimum Density Interconnection Trees, Proc. IEEE International Symposium on Circuits and Systems, Chicago, May 1993, pp. 1865-1868.
46. Boese, K. D., Kahng, A. B., and Robins, G., High Performance Routing Trees With Identified Critical Sinks, Proc. ACM/IEEE Design Automation Conference, Dallas, June 1993, pp. 182-187.
47. Boese, K. D., Kahng, A. B., McCoy, B. A. and Robins, G., Fidelity and Near-Optimality of Elmore-Based Routing Constructions, Proc. IEEE International Conference on Computer Design, Cambridge, October 1993, pp. 81-84.
48. McCoy, B. A., and Robins, G., Non-Tree Routing, Proc. European Design Automation Conference, Paris, France, February 1994, pp. 430-434.
49. Alexander, M. J., and Robins, G., A Unified New Approach to FPGA Routing Based on Multi-Weighted Graphs, Proc. ACM/SIGDA International Workshop on Field-Programmable Gate Arrays, Berkeley, CA, February 1994.
50. Hodes, T. D., McCoy, B. A., and Robins, G., Dynamically-Wiresized Elmore-Based Routing Constructions, IEEE International Symposium on Circuits and Systems, London, England, May 1994, Volume I, pp. 463-466.
51. Robins, G., and Salowe, J. S., On the Maximum Degree of Minimum Spanning Trees, ACM Symposium on Computational Geometry, Stony Brook, NY, June 1994, pp. 250-258.
52. Boese, K. D., Kahng, A. B., McCoy, B. A., and Robins, G., Rectilinear Steiner Trees with Minimum Elmore Delay, Proc. ACM/IEEE Design Automation Conference, San Diego, CA, June 1994, pp. 381-386.
53. Alexander, M. J., and Robins, G., High Performance Routing for Field-Programmable Gate Arrays, Proc. IEEE International ASIC Conference, Rochester, NY, September 1994, pp. 138-141.
54. Robins, G., and Robinson, B. L., Pattern Minefield Detection from Inexact Data, Proc. SPIE International Symposium on Aerospace/Defense Sensing and Dual-Use Photonics, Volume 2496, Orlando, FL, April 1995, pp. 568-574.
55. Pearson, W. R., Robins, G., Wrege, D. E., and Zhang, T., **A New Approach to Primer Selection in Polymerase Chain Reaction Experiments**, Proc. International Conference on Intelligent Systems for Molecular Biology, Cambridge, England, July, 1995, pp. 285-291.
56. Bateman, C. D., Helvig, C. S., Robins, G., and Zelikovsky, A., Provably-Good Routing Tree Construction with Multi-Port Terminals, ACM/SIGDA International Symposium on Physical Design, Napa Valley, CA, April, 1997, pp. 96-102
57. Helvig, C. S., Robins, G., and Zelikovsky, A., Improved Approximation Bounds for the Group Steiner Problem, Proc. Conference on Design Automation and Test in Europe, Paris, France, February, 1998, pp. 406-413.
58. Kahng, A. B., Robins, G., Singh, A., Wang, H., and Zelikovsky, A., Filling and Slotting: Analysis and Algorithms, Proc. International Symposium on Physical Design, Monterey, California, April, 1998, pp. 95-102.
59. Helvig, C. S., Robins, G., and Zelikovsky, A., oving-Target TSP and Related Problems, Proc. European Symposium on Algorithms, Venice, Italy, August, 1998, pp. 453-464.
60. Kahng, A. B., Robins, G., Singh, A., and Zelikovsky, A., New and Exact Filling Algorithms for Layout Density Control, Proc. VLSI Design Conference, Goa, India, January 1999, pp. 106-110.

61. Kahng, Robins, Singh, and Zelikovsky, New Multi-Level and Hierarchical Algorithms for Layout Density Control, Proc. Asia and South Pacific Design Automation Conf., Hong Kong, 1999, pp. 221-224. **Nominated for Best Paper Award.**
62. Robins, G., and Zelikovsky, A., Improved Steiner Tree Approximation in Graphs, SIAM-ACM Symposium on Discrete Algorithms (SODA), San Francisco, CA, January 2000, pp. 770-779. **Highly cited paper**
63. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Monte-Carlo Algorithms for Layout Density Control, Proc. Asia and South Pacific Design Automation Conference, Yokohama, Japan, January 2000, pp. 523-528.
64. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Practical Iterated Fill Synthesis for CMP Uniformity, Proc. Design Automation Conference, Los Angeles, June 2000, pp. 671-674.
65. Blair, D., and Robins, G., **A New Distributed System for Large-Scale Sequence Analyses**, International Conference on Intelligent Systems for Molecular Biology, San Diego, August 2000.
66. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Hierarchical Dummy Fill for Process Uniformity, Asia and South Pacific Design Automation Conference, Yokohama, Japan, January 2001, pp. 139-144.
67. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Closing the Smoothness and Uniformity Gap in Area Fill Synthesis, ACM/SIGDA International Symposium on Physical Design, Del Mar, CA, April 2002, pp. 137-142.
68. Chen, Y., Kahng, A. B., Robins, G., and Zelikovsky, A., Monte-Carlo Methods for Chemical-Mechanical Planarization on Multiple-Layer and Dual-Material Models, Proc. Microlithography 2002, SPIE, Santa Clara, CA, March 2002.
69. Chen, Y., Kahng, A. B., Robins, G., Zelikovsky, A., and Zheng, Y., Area Fill Generation With Inherent Data Volume Reduction, Proc. Design Automation and Testing in Europe, Munich, Germany, March 2003, pp. 868-873.
70. Bolotnyy, L., and Robins, G., Multi-Tag Radio Frequency Identification Systems, Proc. IEEE Workshop on Automatic Identification Advanced Technologies, October, 2005, pp. 83-88.
71. Bolotnyy, and Robins, Randomized Pseudo-Random Function Tree Walking Algorithm for Secure Radio-Frequency Identification, Proc. IEEE Workshop on Automatic Identification Advanced Technologies, October, 2005, pp. 43-48.
72. Bolotnyy, L., and Robins, G., Generalized 'Yoking Proofs' for a Group of Radio Frequency Identification Tags, Proc. International Conf. on Mobile and Ubiquitous Systems: Networks and Services, San Jose, CA, July, 2006.
73. Bolotnyy, L., and Robins, G., Physically Unclonable Function -Based Security and Privacy in RFID Systems, Proc. IEEE International Conference on Pervasive Computing and Communications, New York, March, 2007, pp. 211-218.
74. Bolotnyy, Krize, and Robins, The Practicality of Multi-Tag RFID Systems, Proc. International Conf. on Enterprise Information System (ICEIS 2007), Funchal, Portugal, June 2007.
75. Bolotnyy, L. and Robins, G., The Case for Multi-Tag RFID Systems, Proc. International Conference on Wireless Algorithms, Systems and Applications (WASA 2007), Chicago, August 2007.
76. Dutta, A., Karnani, N., Malhotra, A., Robins, G., and Taylor, C. M., **Extraction of Human DNA Replication Timing Patterns from Discrete Microarray Data**, IAPR International Conference on Pattern Recognition in Bioinformatics (PRIB 2008), Melbourne, Australia, October, 2008.

### C. Research Support

#### Ongoing Research Support:

Robins (PI)	8/2007 - 7/2011	CNS-0716635
National Science Foundation	\$450,000	
New Directions in Reliability, Security and Privacy for Radio Frequency Identification (RFID) Systems		

#### Completed Research Support:

Robins (PI)	8/1999 - 8/2003	CCR-9988331
National Science Foundation	\$421,943	
Research in Layout Optimization for Advanced Manufacturability Considerations		
Robins (PI)	9/1995 - 9/2003	1995
Packard Foundation Fellowship	\$550,000	
Efficient Algorithms for Combinatorial Problems		
Robins (PI)	9/1994 - 9/2000	MIP-9457412
NSF Foundation Young Investigator Award	\$312,500	
New Directions in VLSI CAD and Computational Biology		
Robins (Co-PI)	9/1994 - 9/2000	LM04961
National Institute of Health / NLM	\$1,175,000	
New Approaches to Phylogeny, Alignment, and Sequence Matching		