

## CURRICULUM VITAE

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**CITIZENSHIP:** U.S.A.

### EDUCATION

Ph.D.	1987	<i>Efficient Parallel Techniques for Computational Geometry</i> Computer Sciences, Purdue Univ. (M.J. Atallah, advisor)
M.S.	1985	Computer Sciences, Purdue Univ.
B.A.	1983	Mathematics and Computer Science, Calvin College

### PROFESSIONAL EXPERIENCE

April '07 to present	Chancellor's Professor, Dept. of Computer Science Univ. of California, Irvine
July '01 to March '07	Professor, Dept. of Computer Science Univ. of California, Irvine
Fall '00	Visiting Professor of Computer Science Brown Univ.
July '96 to June '02	Professor of Computer Science (on leave, from July '01) Johns Hopkins Univ.
July '92 to June '96	Associate Professor of Computer Science Johns Hopkins Univ.
Spring '94	Visiting Associate Professor of Computer Science Univ. of Illinois, Urbana-Champaign
July '87 to June '92	Assistant Professor of Computer Science Johns Hopkins Univ.

### RESEARCH INTERESTS

Algorithm and Data Structure Design  
Information Assurance and Security  
Parallel and Distributed Computing  
Graph and Geometric Algorithms

### HONORS AND AWARDS

- *Comper Loveless Fellowship in Computer Sciences*, Purdue Univ., 1985
- *Research Initiation Award*, National Science Foundation, 1988
- *Oraculum Award for Excellence in Teaching*, Johns Hopkins, 1993, 1994, 1995
- *ACM Recognition of Service Award*, 1996
- *Robert B. Pond, Sr. Award for Excellence in Undergraduate Teaching*, Johns Hopkins, 1998
- *Elected Senior Member*, the Institute of Electrical and Electronics Engineers (IEEE), 1999
- *Spirit of Technology Transition Award*, DARPA Dynamic Coalitions Program, 2002
- *Brown Univ. Award for Technological Innovation* (with R. Tamassia, N. Triandopoulos, D. Yao, and D. Ellis), 2006
- *ACM Distinguished Scientist*, 2006

- *2006 IEEE Computer Society Technical Achievement Award*, “for outstanding contributions to the design of parallel and distributed algorithms for fundamental combinatorial and geometric problems”
- *Fulbright Scholar*, 2007, for senior specialist service to University of Aarhus, Denmark
- *Fellow of the San Diego Supercomputer Center*, 2007
- *Fellow of the American Association for the Advancement of Science (AAAS)*, “for distinguished contributions to parallel and distributed algorithms for combinatorial and geometric problems, and excellence in teaching, academic and professional service, and textbook writing,” 2007
- *Fellow of the Institute of Electrical and Electronics Engineers (IEEE)*, “for contributions to parallel and distributed algorithms for combinatorial and geometric problems,” 2009
- *Fellow of the ACM*, “for contributions to data structures and algorithms for combinatorial and geometric problems,” 2009

## PUBLICATIONS

### Patents:

- P-1. M.T. Goodrich and R. Tamassia, “Efficient Authenticated Dictionaries with Skip Lists and Commutative Hashing,” U.S. Patent 7,257,711, August 14, 2007.
- P-2. J.W. Green, J.L. Schultz, Y. Amir, and M.T. Goodrich, “High Refresh-Rate Retrieval of Freshly Published Content using Distributed Crawling,” U.S. Patent 7,299,219, November 20, 2007.
- P-3. G. Ateniese, B. de Medeiros, and M.T. Goodrich, “Intermediated Delivery Scheme for Asymmetric Fair Exchange of Electronic Items,” patent pending.
- P-4. M.T. Goodrich, R. Tamassia, and N. Triandopoulos, “Load-Balanced Distributed Authentication Structures,” patent pending.
- P-5. M.T. Goodrich, R. Tamassia, and D. Yao, “Notarized Federated Identity Mangement for Web Services,” patent pending.
- P-6. M.T. Goodrich, R. Tamassia, and N. Triandopoulos, “Super-Efficient Verification of Dynamic Outsourced Databases,” patent pending.
- P-7. D. Eppstein, M.T. Goodrich, and R. Tamstorf, “Attribute Transfer Between Computer Models Including Identifying Isomorphic Regions in Polygonal Meshes,” patent pending.

### Books and Monographs:

- B-1. M.T. Goodrich and R. Tamassia, *Data Structures and Algorithms in Java*, John Wiley and Sons, Inc., 1998.
- B-2. M.T. Goodrich and C.C. McGeoch, eds., *Algorithm Engineering and Experimentation*, Lecture Notes in Computer Science (LNCS), Vol. 1619, Springer-Verlag, 1999.
- B-3. M.T. Goodrich and R. Tamassia, *Data Structures and Algorithms in Java, Second Edition*, John Wiley and Sons, Inc., 2001.
- B-4. M.T. Goodrich and R. Tamassia, *Algorithm Design: Foundations, Analysis, and Internet Examples*, John Wiley and Sons, Inc., 2002.
- B-5. M.T. Goodrich and S.G. Kobourov, eds., *10th International Symposium on Graph Drawing (GD)*, Lecture Notes in Computer Science, Vol. 2528, Springer-Verlag, 2002.
- B-6. M.T. Goodrich, R. Tamassia, and D. Mount, *Data Structures and Algorithms in C++*, John Wiley and Sons, Inc., 2004.

- B-7. M.T. Goodrich and R. Tamassia, *Data Structures and Algorithms in Java, Third Edition*, John Wiley and Sons, Inc., 2004.
- B-8. M.T. Goodrich and R. Tamassia, *Data Structures and Algorithms in Java, Fourth Edition*, John Wiley and Sons, Inc., 2006.
- B-9. M.T. Goodrich and R. Tamassia, *Data Structures and Algorithms in Java, Fifth Edition*, John Wiley and Sons, Inc., 2011.
- B-10. M.T. Goodrich and R. Tamassia, *Introduction to Computer Security*, Addison-Wesley, Inc., 2011.
- B-11. M.T. Goodrich, R. Tamassia, and D. Mount, *Data Structures and Algorithms in C++, Second Edition*, John Wiley and Sons, Inc., 2011.

### **Book Chapters:**

- Ch-1. M.J. Atallah and M.T. Goodrich, “Deterministic Parallel Computational Geometry,” in *Synthesis of Parallel Algorithms*, J.H. Reif, ed., Morgan Kaufmann, 497–536, 1993.
- Ch-2. M.T. Goodrich, “The Grand Challenges of Geometric Computing,” in *Developing a Computer Science Agenda for High-Performance Computing*, U. Vishkin, ed., ACM Press, 64–68, 1994.
- Ch-3. M.T. Goodrich, “Parallel Algorithms in Geometry,” *CRC Handbook of Discrete and Computational Geometry*, J.E. Goodman and J. O’Rourke, eds., CRC Press, Inc., 669–682, 1997.
- Ch-4. M.T. Goodrich and K. Ramaiyer, “Geometric Data Structures,” *Handbook of Computational Geometry*, J.-R. Sack and J. Urrutia, eds., Elsevier Science Publishing, 463–489, 2000.
- Ch-5. M.T. Goodrich and R. Tamassia, “Simplified Analyses of Randomized Algorithms for Searching, Sorting, and Selection,” *Handbook of Randomized Computing*, S. Rajasekaran, P.M. Pardalos, J.H. Reif, and J.D.P. Rolim, eds., Kluwer Academic Publishers, Vol. 1, 23–34, 2001.
- Ch-6. M.T. Goodrich, “Parallel Algorithms in Geometry,” *Handbook of Discrete and Computational Geometry, Second Edition*, J.E. Goodman and J. O’Rourke, eds., Chapman & Hall/CRC Press, Inc., 953–967, 2004. (Revised version of Ch-3.)
- Ch-7. C. Duncan and M.T. Goodrich, “Approximate Geometric Query Structures,” *Handbook of Data Structures and Applications*, Chapman & Hall/CRC Press, Inc., 26-1–26-17, 2005.
- Ch-8. M.T. Goodrich, R. Tamassia, and L. Vismara, “Data Structures in JDSL,” *Handbook of Data Structures and Applications*, Chapman & Hall/CRC Press, Inc., 43-1–43-22, 2005.
- Ch-9. Y. Cho, L. Bao and M.T. Goodrich, “Secure Location-Based Access Control in WLAN Systems,” *From Problem Toward Solution: Wireless and Sensor Networks Security*, Zhen Jiang and Yi Pan, eds., Nova Science Publishers, Inc., Chapter 17, 2007.
- Ch-10. M.T. Goodrich and M.J. Nelson, “Distributed Peer-to-Peer Data Structures,” *Handbook of Parallel Computing: Models, Algorithms and Applications*, R. Rajasekaran and J. Reif, eds., CRC Press, 17-1–17-17, 2008.
- Ch-11. C.A. Duncan and M.T. Goodrich, “Planar Orthogonal and Polyline Drawing Algorithms,” *Handbook of Graph Drawing and Visualization*, Chapman & Hall/CRC Press, Inc., to appear.

### **Journal Papers:**

- J-1. M.J. Atallah and M.T. Goodrich, “Efficient Parallel Solutions to Some Geometric Problems,” *Journal of Parallel and Distributed Computing*, **3**(4), 1986, 492–507.

- J-2. M.T. Goodrich, “Finding the Convex Hull of a Sorted Point Set in Parallel,” *Information Processing Letters*, **26**, 1987, 173–179.
- J-3. H. ElGindy and M.T. Goodrich, “Parallel Algorithms for Shortest Path Problems in Polygons,” *The Visual Computer*, **3**(6), 1988, 371–378.
- J-4. M.J. Atallah and M.T. Goodrich, “Parallel Algorithms For Some Functions of Two Convex Polygons,” *Algorithmica*, **3**, 1988, 535–548.
- J-5. M.J. Atallah, R. Cole, and M.T. Goodrich, “Cascading Divide-and-Conquer: A Technique for Designing Parallel Algorithms,” *SIAM Journal on Computing*, **18**(3), 1989, 499–532.
- J-6. M.T. Goodrich, “Triangulating a Polygon in Parallel,” *Journal of Algorithms*, **10**, 1989, 327–351.
- J-7. M.T. Goodrich and M.J. Atallah, “On Performing Robust Order Statistics in Tree-Structured Dictionary Machines,” *Journal of Parallel and Distributed Computing*, **9**(1), 1990, 69–76.
- J-8. M.T. Goodrich and J.S. Snoeyink, “Stabbing Parallel Segments with a Convex Polygon,” *Computer Vision, Graphics and Image Processing*, **49**, 1990, 152–170.
- J-9. J. Johnstone and M.T. Goodrich, “A Localized Method for Intersecting Plane Algebraic Curve Segments,” *The Visual Computer*, **7**(2–3), 1991, 60–71.
- J-10. M.T. Goodrich, “Intersecting Line Segments in Parallel with an Output-Sensitive Number of Processors,” *SIAM Journal on Computing*, **20**(4), 1991, 737–755.
- J-11. R. Cole and M.T. Goodrich, “Optimal Parallel Algorithms for Point-Set and Polygon Problems,” *Algorithmica*, **7**, 1992, 3–23.
- J-12. M.T. Goodrich, “A Polygonal Approach to Hidden-Line and Hidden-Surface Elimination,” *Computer Vision, Graphics, and Image Processing: Graphical Models and Image Processing*, **54**(1), 1992, 1–12.
- J-13. M.T. Goodrich, S. Shauck, and S. Guha, “Parallel Methods for Visibility and Shortest Path Problems in Simple Polygons,” *Algorithmica*, **8**, 1992, 461–486, with addendum in *Algorithmica*, **9**, 1993, 515–516.
- J-14. M.T. Goodrich, C. Ó’Dúnlaing, and C. Yap “Computing the Voronoi Diagram of a Set of Line Segments in Parallel,” *Algorithmica*, **9**, 1993, 128–141.
- J-15. M.T. Goodrich, “Constructing the Convex Hull of a Partially Sorted Set of Points,” *Computational Geometry: Theory and Applications*, **2**, 1993, 267–278.
- J-16. M.T. Goodrich, “Constructing Arrangements Optimally in Parallel,” *Discrete and Computational Geometry*, **9**, 1993, 371–385.
- J-17. M.T. Goodrich, M.J. Atallah, and M. Overmars, “Output-Sensitive Methods for Rectilinear Hidden Surface Removal,” *Information and Computation*, **107**(1), 1993, 1–24.
- J-18. M.J. Atallah, P. Callahan, and M.T. Goodrich, “P-Complete Geometric Problems,” *Int. Journal of Computational Geometry & Applications*, **3**(4), 1993, 443–462.
- J-19. M.J. Atallah, M.T. Goodrich, and S.R. Kosaraju, “Parallel Algorithms for Evaluating Sequences of Set-Manipulation Operations,” *Journal of the ACM*, **41**(6), 1994, 1049–1088.
- J-20. M.T. Goodrich, “Efficient Piecewise-Linear Function Approximation Using the Uniform Metric,” *Discrete and Computational Geometry*, **14**, 1995, 445–462.
- J-21. H. Brönnimann and M.T. Goodrich, “Almost Optimal Set Covers in Finite VC-Dimension,” *Discrete and Computational Geometry*, **14**, 1995, 463–479.
- J-22. M.T. Goodrich, “Planar Separators and Parallel Polygon Triangulation,” *J. Computer and System Sciences*, **51**(3), 1995, 374–389.

- J-23. M.T. Goodrich, M. Ghouse, and J. Bright, “Sweep Methods for Parallel Computational Geometry,” *Algorithmica*, **15**(2), 1996, 126–153.
- J-24. M.T. Goodrich and S.R. Kosaraju, “Sorting on a Parallel Pointer Machine with Applications to Set Expression Evaluation,” *Journal of the ACM*, **43**(2), 1996, 331–361.
- J-25. A. Garg, M.T. Goodrich, and R. Tamassia, “Planar Upward Tree Drawings with Optimal Area,” *International Journal of Computational Geometry & Applications*, **6**(3), 1996, 333–356.
- J-26. M.H. Nodine, M.T. Goodrich, and J.S. Vitter, “Blocking for External Graph Searching,” *Algorithmica*, **16**(2), 1996, 181–214.
- J-27. R. Cole, M.T. Goodrich, C. Ó Dúnlaing, “A Nearly Optimal Deterministic Parallel Voronoi Diagram Algorithm,” *Algorithmica*, **16**, 1996, 569–617.
- J-28. G. Das and M.T. Goodrich, “On the Complexity of Optimization Problems for 3-Dimensional Convex Polyhedra and Decision Trees,” *Computational Geometry: Theory and Applications*, **8**, 1997, 123–137.
- J-29. M.T. Goodrich and R. Tamassia, “Dynamic Ray Shooting and Shortest Paths via Balanced Geodesic Triangulations,” *J. Algorithms*, **23**, 1997, 51–73.
- J-30. M. Ghouse and M.T. Goodrich, “Fast Randomized Parallel Methods for Planar Convex Hull Construction,” *Computational Geometry: Theory and Applications*, **7**, 1997, 219–235.
- J-31. L.P. Chew, M.T. Goodrich, D.P. Huttenlocher, K. Kedem, J.M. Kleinberg, and D. Kravets, “Geometric Pattern Matching under Euclidean Motion,” *Computational Geometry: Theory and Applications*, **7**, 1997, 113–124.
- J-32. M.T. Goodrich and E.A. Ramos, “Bounded-Independence Derandomization of Geometric Partitioning with Applications to Parallel Fixed-Dimensional Linear Programming,” *Discrete & Computational Geometry*, **18**(4), 1997, 397–420.
- J-33. M.T. Goodrich, “An Improved Ray Shooting Method for Constructive Solid Geometry Models via Tree Contraction,” *International Journal of Computational Geometry & Applications*, **8**(1), 1998, 1–23.
- J-34. G. Barequet, A.J. Briggs, M.T. Dickerson, and M.T. Goodrich, “Offset-Polygon Annulus Placement Problems,” *Computational Geometry: Theory and Applications*, **11**(3–4), 1998–99, 125–141.
- J-35. M.T. Goodrich and R. Tamassia, “Dynamic Trees and Dynamic Point Location,” *SIAM J. Comput.*, **28**(2), 1999, 612–636.
- J-36. G. Barequet, S.S. Bridgeman, C.A. Duncan, M.T. Goodrich, and R. Tamassia, “GeomNet: Geometric Computing Over the Internet,” *IEEE Internet Computing*, **3**(2), 1999, 21–29.
- J-37. M.T. Goodrich, J.S.B. Mitchell, and M.W. Orletsky, “Approximate Geometric Pattern Matching Under Rigid Motion,” *IEEE Trans. on Pattern Analysis and Machine Intelligence*, **21**(4), 1999, 371–379.
- J-38. M.T. Goodrich, “Communication-Efficient Parallel Sorting,” *SIAM Journal on Computing*, **29**(2), 1999, 416–432.
- J-39. C.A. Duncan, M.T. Goodrich, S.G. Kobourov, “Balanced Aspect Ratio Trees and Their Use for Drawing Very Large Graphs,” *Journal of Graph Algorithms and Applications*, **4**(3), 2000, 19–46. Also available at [www.cs.brown.edu/publications/jgaa/](http://www.cs.brown.edu/publications/jgaa/).
- J-40. M.T. Goodrich and C.G. Wagner, “A Framework for Drawing Planar Graphs with Curves and Polylines,” *Journal of Algorithms*, **37**, 2000, 399–421.

- J-41. C.A. Duncan, M.T. Goodrich, S.G. Kobourov, “Balanced Aspect Ratio Trees: Combining the Benefits of  $k$ -D Trees and Octrees,” *J. Algorithms*, **38**, 2001, 303–333.
- J-42. G. Barequet, M. Dickerson, and M.T. Goodrich, “Voronoi Diagrams for Polygon-Offset Distance Functions,” *Discrete and Computational Geometry*, **25**(2), 2001, 271–291.
- J-43. C.C. Cheng, C.A. Duncan, M.T. Goodrich, and S.G. Kobourov, “Drawing Planar Graphs with Circular Arcs,” *Discrete and Computational Geometry*, **25**(3), 2001, 405–418.
- J-44. N.M. Amato, M.T. Goodrich, and E.A. Ramos, “A Randomized Algorithm for Triangulating a Simple Polygon in Linear Time,” *Discrete and Computational Geometry*, **26**(2), 2001, 245–265.
- J-45. R. Tamassia, M.T. Goodrich, L. Vismara, M. Handy, G. Shubina, R. Cohen, B. Hudson, R.S. Baker, N. Gelfand, and U. Brandes, “JDLS: The Data Structures Library in Java,” *Dr. Dobbs Journal*, **323**, 2001, 21–31.
- J-46. G. Barequet, D.Z. Chen, O. Daescu, M.T. Goodrich, and J.S. Snoeyink, “Efficiently Approximating Polygonal Paths in Three and Higher Dimensions,” *Algorithmica*, **33**(2), 2002, 150–167.
- J-47. T. Chan, M.T. Goodrich, S.R. Kosaraju, and R. Tamassia, “Optimizing Area and Aspect Ratio in Straight-Line Orthogonal Tree Drawings,” *Computational Geometry: Theory and Applications*, **23**(2), 2002, 153–162.
- J-48. C.A. Duncan, M.T. Goodrich, and S.G. Kobourov, “Planarity-Preserving Clustering and Embedding for Large Planar Graphs,” *Computational Geometry: Theory and Applications*, **24**(2), 2003, 95–114.
- J-49. A.L. Buchsbaum and M.T. Goodrich, “Three-Dimensional Layers of Maxima,” *Algorithmica*, **39**, 2004, 275–286.
- J-50. G. Barequet, M.T. Goodrich, and C. Riley, “Drawing Graphs with Large Vertices and Thick Edges,” *J. of Graph Algorithms and Applications (JGAA)*, **8**(1), 2004, 3–20.
- J-51. G. Barequet, M.T. Goodrich, A. Levi-Steiner, and D. Steiner, “Contour Interpolation by Straight Skeletons,” *Graphical Models (GM)*, **66**(4), 2004, 245–260.
- J-52. P. Gajer, M.T. Goodrich, and S.G. Kobourov, “A Multi-Dimensional Approach to Force-Directed Layouts of Large Graphs,” *Computational Geometry: Theory and Applications*, **29**(1), 3–18, 2004.
- J-53. G. Barequet, P. Bose, M.T. Dickerson, and M.T. Goodrich, “Optimizing a Constrained Convex Polygonal Annulus,” *J. of Discrete Algorithms (JDA)*, **3**(1), 1–26, 2005.
- J-54. A. Bagchi, A.L. Buchsbaum, and M.T. Goodrich, “Biased Skip Lists,” *Algorithmica*, **42**(1), 31–48, 2005.
- J-55. M. Dickerson, D. Eppstein, M.T. Goodrich, J. Meng, “Confluent Drawings: Visualizing Non-planar Diagrams in a Planar Way,” *J. of Graph Algorithms and Applications (JGAA)*, **9**(1), 31–52, 2005.
- J-56. A. Bagchi, A. Chaudhary, M.T. Goodrich, C. Li, and M. Shmueli-Scheuer, “Achieving Communication Efficiency through Push-Pull Partitioning of Semantic Spaces to Disseminate Dynamic Information,” *IEEE Trans. on Knowledge and Data Engineering (TKDE)*, **18**(10), 1352–1367, 2006.
- J-57. D. Eppstein, M.T. Goodrich, and J.Y. Meng, “Confluent Layered Drawings,” *Algorithmica*, **47**(4), 439–452, 2007.
- J-58. A. Bagchi, A. Chaudhary, D. Eppstein, and M.T. Goodrich, “Deterministic Sampling and

- Range Counting in Geometric Data Streams,” *ACM Transactions on Algorithms*, **3**(2), Article 16, 2007, 18 pages.
- J-59. D. Eppstein, M.T. Goodrich, and D. Hirschberg, “Improved Combinatorial Group Testing Algorithms for Real-World Problem Sizes,” *SIAM Journal on Computing*, **36**(5), 1360–1375, 2007.
- J-60. D. Eppstein, M.T. Goodrich, and J.Z. Sun, “Skip Quadtrees: Dynamic Data Structures for Multidimensional Point Sets,” *Int. Journal on Computational Geometry and Applications*, **18**(1/2), 131–160, 2008.
- J-61. M.T. Goodrich, “Probabilistic Packet Marking for Large-Scale IP Traceback,” *IEEE/ACM Transactions on Networking*, **16**(1), 15–24, 2008.
- J-62. M.T. Goodrich and D.S. Hirschberg, “Improved Adaptive Group Testing Algorithms with Applications to Multiple Access Channels and Dead Sensor Diagnosis,” *Journal of Combinatorial Optimization*, **15**(1), 95–121, 2008.
- J-63. M.T. Goodrich, R. Tamassia, and D. Yao, “Notarized Federated Identity Management for Web Services,” *Journal of Computer Security*, **16**(4), 399–418, 2008.
- J-64. M.T. Goodrich, “Pipelined Algorithms to Detect Cheating in Long-Term Grid Computations,” *Theoretical Computer Science*, **408**, 199–207, 2008.
- J-65. D. Eppstein, M.T. Goodrich, E. Kim, and R. Tamstorf, “Motorcycle Graphs: Canonical Quad Mesh Partitioning,” *Computer Graphics Forum*, special issue on papers from 6th European Symposium on Geometry Processing (SGP), **27**(6), 1477–1486, 2008.
- J-66. M.T. Goodrich, M. Sirivianos, J. Solis, C. Soriente, G. Tsudik, E. Uzun, “Using Audio in Secure Device Pairing,” *Int. J. Security and Networks*, **4**(1/2), 57–68, 2009.
- J-67. M.T. Goodrich, “On the Algorithmic Complexity of the Mastermind Game with Black-Peg Results,” *Information Processing Letters*, **109**, 675–678, 2009.
- J-68. D. Eppstein, M.T. Goodrich, E. Kim, and R. Tamstorf, “Approximate Topological Matching of Quad Meshes,” *The Visual Computer*, **25**(8), 771–783, 2009.
- J-69. D. Eppstein and M.T. Goodrich, “Succinct Greedy Geometric Routing Using Hyperbolic Geometry,” *IEEE Transactions on Computers*, Dec. 2010, IEEE Computer Society Digital Library.
- J-70. D. Eppstein, M.T. Goodrich, and D. Strash, “Linear-Time Algorithms for Geometric Graphs with Sublinearly Many Edge Crossings,” *SIAM Journal on Computing*, **39**(8), 3814–3829, 2010.
- J-71. M.T. Goodrich, R. Tamassia, and N. Triandopoulos, “Efficient Authenticated Data Structures for Graph Connectivity and Geometric Search Problems,” *Algorithmica*, **60**(3), 505–552, 2011.
- J-72. D. Eppstein and M.T. Goodrich, “Straggler Identification in Round-Trip Data Streams via Newton’s Identities and Invertible Bloom Filters,” *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, **23**, 297–306, 2011.
- J-73. C.A. Duncan, M.T. Goodrich, S.G. Kobourov, “Planar Drawings of Higher-Genus Graphs,” *Journal of Graph Algorithms and Applications*, **15**(1), 7–32, 2011.
- J-74. A.U. Asuncion and M.T. Goodrich, “Nonadaptive Mastermind Algorithms for String and Vector Databases, with Case Studies,” *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 297–306, 2011.
- J-75. M.T. Goodrich, “Randomized Shellsort: A Simple Data-Oblivious Sorting Algorithm,” *Jour-*

*nal of the ACM*, accepted for publication.

- J-76. C.A. Duncan, D. Eppstein, M.T. Goodrich, S. Kobourov, and M. Nöllenburg, “Lombardi Drawings of Graphs,” *Journal of Graph Algorithms and Applications*, **16**(1), 85–108, 2012.
- J-77. M.T. Dickerson, M.T. Goodrich, T.D. Dickerson, and Y.D. Zhuo “Round-Trip Voronoi Diagrams and Doubling Density in Geographic Networks,” *Transactions on Computational Science*, M.L. Gavrilova et al. (Eds.), Vol. XIV, LNCS 6970, pp. 211–238.

### **Papers in Reviewed Conference Proceedings:**

- C-1. M.J. Atallah and M.T. Goodrich, “Efficient Parallel Solutions to Some Geometric Problems,” *1985 IEEE Int. Conf. on Parallel Processing*, 411–417. (Preliminary version of J-1.)
- C-2. F. Berman, M.T. Goodrich, C. Koebel, W. Robison, and K. Showell, “Prep-P: A Mapping Preprocessor for CHiP Computers,” *1985 IEEE Int. Conf. on Parallel Processing*, 731–733.
- C-3. M.J. Atallah and M.T. Goodrich, “Parallel Algorithms For Some Functions of Two Convex Polygons,” *24th Allerton Conf. on Communication, Control and Computing*, 1986, 758–767. (Preliminary version of J-4.)
- C-4. M.J. Atallah and M.T. Goodrich, “Efficient Plane Sweeping in Parallel,” *2nd ACM Symp. on Computational Geometry (SCG)*, 1986, 216–225.
- C-5. M.T. Goodrich, “A Polygonal Approach to Hidden-Line Elimination,” *25th Allerton Conf. on Communication, Control, and Computing*, 1987, 849–858. (Preliminary version of J-12.)
- C-6. M.J. Atallah, R. Cole, and M.T. Goodrich, “Cascading Divide-and-Conquer: A Technique for Designing Parallel Algorithms,” *28th IEEE Symp. on Foundations of Computer Science (FOCS)*, 1987, 151-160. (Preliminary version of J-5.)
- C-7. M.J. Atallah, M.T. Goodrich, and S.R. Kosaraju, “Parallel Algorithms for Evaluating Sequences of Set-Manipulation Operations,” *3rd Aegean Workshop on Computing (AWOC), Lecture Notes in Computer Science (LNCS): 319*, Springer-Verlag, 1988, 1–10. (Preliminary version of J-19.)
- C-8. R. Cole and M.T. Goodrich, “Optimal Parallel Algorithms for Point-Set and Polygon Problems,” *4th ACM Symp. on Computational Geometry (SCG)*, 1988, 201–210. (Preliminary version of J-11.)
- C-9. M.T. Goodrich, “Intersecting Line Segments in Parallel with an Output-Sensitive Number of Processors,” *1989 ACM Symp. on Parallel Algorithms and Architectures (SPAA)*, 127–137. (Preliminary version of J-10.)
- C-10. M.T. Goodrich and S.R. Kosaraju, “Sorting on a Parallel Pointer Machine with Applications to Set Expression Evaluation,” *30th IEEE Symp. on Foundations of Computer Science (FOCS)*, 1989, 190–195. (Preliminary version of J-24.)
- C-11. M.T. Goodrich, C. Ó’Dúnlaing, and C. Yap “Computing the Voronoi Diagram of a Set of Line Segments in Parallel,” *Lecture Notes in Computer Science 382, Algorithms and Data Structures (WADS)*, Springer-Verlag, 1989, 12–23. (Preliminary version of J-14.)
- C-12. M.T. Goodrich and J.S. Snoeyink, “Stabbing Parallel Segments with a Convex Polygon,” *Lecture Notes in Computer Science 382, Algorithms and Data Structures (WADS)*, Springer-Verlag, 1989, 231–242. (Preliminary version of J-8.)
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- C-123. D. Eppstein, M.T. Goodrich, E. Kim, and R. Tamstorf, “Approximate Topological Matching of Quadrilateral Meshes,” *Proc. IEEE Int. Conf. on Shape Modeling and Applications (SMI)*, 2008, 83–92. (Preliminary version of J-68.)
- C-124. G. Barequet, D. Eppstein, M.T. Goodrich, and A. Waxman, “Straight Skeletons of Three-Dimensional Polyhedra,” *Proc. 16th European Symposium on Algorithms (ESA)*, LNCS, vol. 5193, 2008, 148–160.
- C-125. M.T. Goodrich, C. Papamanthou, R. Tamassia, and N. Triandopoulos, “Athos: Efficient Authentication of Outsourced File Systems,” *Proc. 11th Information Security Conference (ISC)*, LNCS, vol. 5222, 2008, 80–96.
- C-126. L. Arge, M.T. Goodrich, M. Nelson, and N. Sitchinava, “Fundamental Parallel Algorithms for Private-Cache Chip Multiprocessors,” *Proc. 20th ACM Symp. on Parallelism in Algorithms and Architectures (SPAA)*, 2008, 197–206.
- C-127. D. Eppstein and M.T. Goodrich, “Succinct Greedy Graph Drawing in the Hyperbolic Plane,” *Proc. 16th Int. Symp. on Graph Drawing (GD)*, LNCS, vol. 5417, Springer-Verlag, 2008, 14–25.
- C-128. D. Eppstein and M.T. Goodrich, “Studying (Non-Planar) Road Networks Through an Algorithmic Lens,” *Proc. 16th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS)*, 2008, 125–134. **Received a Best Paper Award from this conference.**
- C-129. M. Dickerson and M.T. Goodrich, “Two-Site Voronoi Diagrams in Geographic Networks,” *Proc. 16th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS)*, 2008, 439–442.
- C-130. D. Eppstein, M.T. Goodrich, and D. Strash, “Linear-Time Algorithms for Geometric Graphs with Sublinearly Many Crossings,” *20th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2009, 150–159.
- C-131. M.T. Goodrich, “The Mastermind Attack on Genomic Data,” *Proc. 30th IEEE Symposium on Security and Privacy (SSP)*, 2009, 204–218.
- C-132. W. Du, D. Eppstein, M.T. Goodrich, and G.S. Lueker, “On the Approximability of Geometric and Geographic Generalization and the Min-Max Bin Covering Problem,” *Proc. Algorithms and Data Structures Symposium (formerly WADS)*, LNCS, vol. 5664, Springer, 2009, 242–253.
- C-133. M.T. Goodrich, R. Tamassia, and N. Triandopoulos, J.Z. Sun, “Reliable Resource Searching in P2P Networks,” *5th International ICST Conference on Security and Privacy in Communication Networks (SecureComm)*, Lecture Notes of ICST, vol. 19, Springer, 2009, 437–447.
- C-134. C.A. Duncan, M.T. Goodrich, S.G. Kobourov, “Planar Drawings of Higher-Genus Graphs,” *Proc. 17th Int. Symp. on Graph Drawing (GD)*, LNCS, Springer, vol. 5849, 2009, 45–56. (Preliminary version of J-73.)
- C-135. D. Eppstein, M.T. Goodrich, L. Trott, “Going Off-road: Transversal Complexity in Road

- Networks,” *Proc. 17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems* (ACM GIS), 2009, 23–32.
- C-136. M.T. Goodrich and Darren Strash, “Succinct Greedy Geometric Routing in the Euclidean Plane,” *20th Int. Symp. on Algorithms and Computation* (ISAAC), LNCS, vol. 5878, Springer, 2009, 781–791.
- C-137. M.T. Goodrich, “Randomized Shellsort: A Simple Oblivious Sorting Algorithm,” *21st ACM-SIAM Symposium on Discrete Algorithms* (SODA), 2010, 1262–1277. (Preliminary version of J-75.)
- C-138. L. Arge, M.T. Goodrich, and N. Sitchinava, “Parallel External Memory Graph Algorithms,” *24th IEEE International Parallel & Distributed Processing Symposium* (IPDPS), 2010, 1–11.
- C-139. G. Wang, T. Luo, M.T. Goodrich, W. Du, and Z. Zhu, “Bureaucratic Protocols for Secure Two-Party Sorting, Selection, and Permuting,” *5th ACM Symposium on Information, Computer and Communications Security*, 2010, 226–237.
- C-140. M.T. Dickerson, M.T. Goodrich, and T.D. Dickerson, “Round-Trip Voronoi Diagrams and Doubling Density in Geographic Networks,” *7th Int. Symp. on Voronoi Diagrams in Science and Engineering* (ISVD), IEEE Press, 2010, 132–141. (Preliminary version of J-77.)
- C-141. M.T. Dickerson, D. Eppstein, and M.T. Goodrich, “Cloning Voronoi Diagrams via Retroactive Data Structures,” *18th European Symposium on Algorithms* (ESA), LNCS, vol. 6346, 2010, 362–373.
- C-142. C.A. Duncan, D. Eppstein, M.T. Goodrich, S. Kobourov, and M. Nöllenburg, “Lombardi Drawings of Graphs,” *Proc. 18th Int. Symp. on Graph Drawing* (GD), LNCS, vol. 6502, 2010, 195–207. (Preliminary version of J-76.)
- C-143. E. Wolf-Chambers, D. Eppstein, M.T. Goodrich, and M. Löffler, “Drawing Graphs in the Plane with a Prescribed Outer Face and Polynomial Area,” *Proc. 18th Int. Symp. on Graph Drawing* (GD), LNCS, vol. 6502, 2010, 129–140.
- C-144. C.A. Duncan, D. Eppstein, M.T. Goodrich, S. Kobourov, and M. Nöllenburg, “Drawing Trees with Perfect Angular Resolution and Polynomial Area,” *Proc. 18th Int. Symp. on Graph Drawing* (GD), LNCS, vol. 6502, 2010, 183–194.
- C-145. A.U. Asuncion and M.T. Goodrich, “Turning Privacy Leaks into Floods: Surreptitious Discovery of Social Network Friendships and Other Sensitive Binary Attribute Vectors,” *Proc. Workshop on Privacy in the Electronic Society* (WPES), held in conjunction with the 17th ACM Conference on Computer and Communications Security (CCS), 2010, 21–30. (Preliminary version of J-74.)
- C-146. D. Eppstein, M.T. Goodrich, D. Strash, and L. Trott, “Extended Dynamic Subgraph Statistics Using h-Index Parameterized Data Structures,” *4th Annual International Conference on Combinatorial Optimization and Applications* (COCO), LNCS, vol. 6508, 2010, 128–141.
- C-147. M.T. Goodrich and D. Strash, “Priority Range Trees,” *Proc. 21st International Symposium on Algorithms and Computation* (ISAAC), LNCS, vol. 6506, 2010, 97–108.
- C-148. D. Eppstein, M.T. Goodrich, R. Tamassia, “Privacy-Preserving Data-Oblivious Geometric Algorithms for Geographic Data,” *Proc. 18th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems* (ACM GIS), 2010, 13–22.
- C-149. M.T. Goodrich, “Spin-the-bottle Sort and Annealing Sort: Oblivious Sorting via Round-robin Random Comparisons,” *8th annual Workshop on Analytic Algorithmics and Combinatorics* (ANALCO), in conjunction with the ACM-SIAM Symposium on Discrete Algorithms

- (SODA), 2011.
- C-150. M.T. Goodrich and F. Kerschbaum, “Privacy-Enhanced Reputation-Feedback Methods to Reduce Feedback Extortion in Online Auctions,” *ACM Conference on Data and Application Security and Privacy (CODASPY)*, 2011, 273–282.
- C-151. M.T. Goodrich, “Data-Oblivious External-Memory Algorithms for the Compaction, Selection, and Sorting of Outsourced Data,” *23rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2011, 379–388.
- C-152. M.T. Goodrich and M. Mitzenmacher, “Brief Announcement: Large-Scale Multimaps,” *23rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2011, 259–260.
- C-153. D. Eppstein, M.T. Goodrich, F. Uyeda, and G. Varghese, “What’s the Difference? Efficient Set Synchronization without Prior Context,” *SIGCOMM* 2011.
- C-154. D. Eppstein, M.T. Goodrich, and M. Löffler, “Tracking Moving Objects with Few Handovers,” *Algorithms and Data Structures Symposium (formerly WADS)*, 362–373, LNCS, vol. 6844, 2011.
- C-155. M.T. Goodrich and M. Mitzenmacher, “Privacy-Preserving Access of Outsourced Data via Oblivious RAM Simulation,” *38th International Colloquium on Automata, Languages and Programming (ICALP)*, LNCS, vol. 6756, 2011, 576–587.
- C-156. M.T. Goodrich and P. Pszona, “External-Memory Network Analysis Algorithms for Naturally Sparse Graphs,” *European Symposium on Algorithms (ESA)*, 2011.
- C-157. C. Duncan, D. Eppstein, M.T. Goodrich, S.G. Kobourov and M. Löffler, “Planar and Poly-Arc Lombardi Drawings,” *Graph Drawing (GD)*, LNCS, vol. 7034, 308–319, 2011.
- C-158. R. Chernobelskiy, K. Cunningham, M.T. Goodrich, S.G. Kobourov and L. Trott, “Force-Directed Lombardi-Style Graph Drawing,” *Graph Drawing (GD)*, LNCS, vol. 7034, 320–331, 2011.
- C-159. M.T. Goodrich and M. Mitzenmacher, “Invertible Bloom Lookup Tables,” *49th Allerton Conference on Communication, Control, and Computing*, IEEE Press, **invited paper**, 2011.
- C-160. M.T. Goodrich, M. Mitzenmacher, O. Ohrimenko, and R. Tamassia, “Oblivious RAM Simulation with Efficient Worst-Case Access Overhead,” *ACM Cloud Computing Security Workshop (CCSW)*, in conjunction with the 17th ACM Conf. on Computer and Communications Security (CCS), 95–100, 2011.
- C-161. M.T. Goodrich and J.A. Simons, “Fully Retroactive Approximate Range and Nearest Neighbor Searching,” *22nd International Symposium on Algorithms and Computation (ISAAC)*, 292–301, 2011.
- C-162. E. Angelino, M.T. Goodrich, M. Mitzenmacher and J. Thaler, “External Memory Multimaps,” *22nd International Symposium on Algorithms and Computation (ISAAC)*, 384–394, 2011.
- C-163. M.T. Goodrich, N. Sitchinava, and Q. Zhang, “Sorting, Searching, and Simulation in the MapReduce Framework,” *22nd International Symposium on Algorithms and Computation (ISAAC)*, 374–383, 2011.
- C-164. D. Eppstein, M.T. Goodrich, M. Löffler, D. Strash and L. Trott, “Category-Based Routing in Social Networks: Membership Dimension and the Small-World Phenomenon,” *IEEE Int. Conf. on Computational Aspects of Social Networks (CASoN)*, 102–107, 2011.
- C-165. M.T. Goodrich, O. Ohrimenko, M. Mitzenmacher, and R. Tamassia, “Privacy-Preserving Group Data Access via Stateless Oblivious RAM Simulation,” *23rd ACM-SIAM Symposium*

on *Discrete Algorithms* (SODA), 2012.

- C-166. M.T. Goodrich, O. Ohrimenko, M. Mitzenmacher, and R. Tamassia, “Practical oblivious storage,” 2nd ACM Conf. on Data and Application Security and Privacy (CODASPY). 13–24, 2012.
- C-167. M.T. Goodrich and M. Mitzenmacher, “Anonymous Card Shuffling and its Applications to Parallel Mixnets,” 39th International Colloquium on Automata, Languages and Programming (ICALP), 2012.

### Other Publications:

- O-1. M.T. Goodrich, “Guest Editor’s Introduction,” *International Journal of Computational Geometry & Applications*, **2**(2), 1992, 113–116.
- O-2. M.T. Goodrich, “Parallel Algorithms Column 1: Models of Computation,” *SIGACT News*, **24**(4), 1993, 16–21.
- O-3. M.T. Goodrich, V. Mirelli, M. Orletsky, and J. Salowe, “Decision tree construction in fixed dimensions: Being global is hard but local greed is good,” Technical Report TR-95-1, Johns Hopkins University, Department of Computer Science, Baltimore, MD 21218, May 1995.
- O-4. R. Tamassia, P.K. Agarwal, N. Amato, D.Z. Chen, D. Dobkin, R.L.S. Drysdale, S. Fortune, M.T. Goodrich, J. Hersherberger, J. O’Rourke, F.P. Preparata, J.-R. Sack, S. Suri, I.G. Tollis, J.S. Vitter, and S. Whitesides, “Strategic Directions in Computational Geometry Working Group Report,” *ACM Computing Surveys*, **28A**(4), December 1996.
- O-5. G.A. Gibson, J.S. Vitter, and J. Wilkes, A. Choudhary, P. Corbett, T.H. Cormen, C.S. Ellis, M.T. Goodrich, P. Highnam, D. Kotz, K. Li, R. Muntz, J. Pasquale, M. Satyanarayanan, D.E. Vengroff, “Report of the Working Group on Storage I/O Issues in Large-Scale Computing,” *ACM Computing Surveys*, **28A**(4), December 1996.
- O-6. T.H. Cormen and M.T. Goodrich, “A Bridging Model for Parallel Computation, Communication, and I/O,” *ACM Computing Surveys*, **28A**(4), December 1996.
- O-7. M.T. Goodrich, “Computer Science Issues in the National Virtual Observatory,” in *Virtual Observatories of the Future*, ASP Conference Series, Vol. 225, R.J. Brunner, S.G. Djorgovski, and A.S. Szalay, eds., 329–332, 2001.
- O-8. M.T. Dickerson and M.T. Goodrich, “Matching Points to a Convex Polygonal Boundary,” Proceedings of the 13th Canadian Conference on Computational Geometry (CCCG’01), 89–92, 2001.
- O-9. M.T. Goodrich, “Guest Editor’s Foreword,” *Algorithmica*, **33**(3), 271, 2002.
- O-10. M.T. Goodrich, M. Shin, C.D. Straub, and R. Tamassia, “Distributed Data Authentication (System Demonstration),” Proc. DARPA Information Survivability Conference and Exposition, IEEE Press, Volume 2, 58–59, 2003.
- O-11. M.T. Goodrich and R. Tamassia, “Efficient and Scalable Infrastructure Support for Dynamic Coalitions,” Proc. DARPA Information Survivability Conference and Exposition, IEEE Press, Volume 2, 246–251, 2003.
- O-12. M.T. Goodrich, “Simulating Parallel Algorithms in the MapReduce Framework with Applications to Parallel Computational Geometry,” Second Workshop on Massive Data Algorithmics (MASSIVE), 2010.

### PROFESSIONAL SERVICE

*Guest Editor:*

*Int. Journal of Computational Geometry & Applications*, **2**(2), 1992  
*Journal of Computer & System Sciences*, **52**(1), 1996  
*Computational Geometry: Theory and Applications*, **12**(1–2), 1999.  
*Algorithmica*, **33**(3), 2002.

*Editorial board membership:*

*Computational Geometry: Theory and Applications*, 2006–  
*Journal of Computer & System Sciences*, 1994–2011  
*Journal of Graph Algorithms and Applications*, 1996–2011  
*Int. Journal of Computational Geometry & Applications*, 1993–2010  
*Information Processing Letters*, 1995–1997

*Advisory board membership:*

*Int. Journal of Computational Geometry & Applications*, 2010–

*Program Committee Service:*

7th ACM Symp. on Computational Geometry (SCG), 1991  
1991 Workshop on Algorithms and Data Structures (WADS)  
8th ACM Symp. on Computational Geometry (SCG), 1992  
25th ACM Symp. on Theory of Computing (STOC), 1993  
*Chair*, 26th ACM Symp. on Theory of Computing (STOC), 1994  
11th ACM Symp. on Computational Geometry (SCG), 1995  
DAGS '95 Conf. on Electronic Publishing and the Information Superhighway  
1996 SIAM Discrete Mathematics Conference  
1997 Workshop on Algorithms and Data Structures (WADS)  
Graph Drawing '97  
1999 Workshop on Algorithms and Data Structures (WADS)  
*Co-chair*, Workshop on Algorithm Engineering and Experimentation (ALENEX), 1999  
Graph Drawing 2000  
2000 Workshop on Algorithm Engineering (WAE)  
41st IEEE Symp. on Foundations of Computer Science (FOCS), 2000  
2001 Workshop on Algorithms and Data Structures (WADS)  
Graph Drawing 2001  
Workshop on Algorithm Engineering and Experimentation (ALENEX), 2002  
18th ACM Symp. on Computational Geometry (SCG), 2002  
13th ACM-SIAM Symp. on Discrete Algorithms (SODA), 2002  
*Co-Chair*, Graph Drawing 2002  
Graph Drawing 2003  
16th ACM-SIAM Symp. on Discrete Algorithms (SODA), 2005  
32nd Int. Colloq. on Automata, Languages and Programming (ICALP), 2005  
12th Int. Computing and Combinatorics Conference (COCOON), 2006  
13th ACM Conf. on Computer and Communication Security (CCS), 2006  
15th Annual European Symposium on Algorithms (ESA), 2007  
5th International Conference on Applied Cryptography and Network Security (ACNS), 2007  
21st IEEE International Parallel & Distributed Processing Symposium (IPDPS), 2007  
19th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2007  
5th Workshop on Algorithms and Models for the Web-Graph (WAW), 2007  
7th International Workshop on Experimental Algorithms (WEA), 2008

Second International Frontiers of Algorithmics Workshop (FAW), 2008  
 16th ACM Int. Symp. on Advances in Geographic Information Systems (ACM GIS), 2008  
 17th ACM Int. Symp. on Advances in Geographic Information Systems (ACM GIS), 2009  
 31st IEEE Symposium on Security and Privacy (SSP), 2010  
 18th Int. Symp. on Graph Drawing (GD), 2010  
 2011 Workshop on Analytic Algorithmics and Combinatorics (ANALCO)  
 8th Workshop on Algorithms and Models for the Web Graph (WAW), 2011  
 19th International Symposium on Graph Drawing, 2011  
 24th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2012  
 20th European Symposium on Algorithms (ESA), Track B, 2012

*Conference Committee Service:*

Conference chair, 12th ACM Symposium on Computational Geometry, 1996  
 Organizer, 1st CGC Workshop on Computational Geometry, 1996  
 Co-chair, 1999 Dagstuhl Workshop on Computational Geometry, 1999  
 Conference chair, Graph Drawing 2002

*Steering Committee and Executive Committee Service:*

Member at large, ACM SIG on Algorithms & Comp. Theory (SIGACT) Exec. Comm., 1993–97  
 Member, Exec. comm. for 1996 Federated Computing Research Conference (FCRC)  
 co-Founder and member, Steering Comm. for Workshop on Algorithm Engineering  
 and Experimentation (ALENEX), 1999–  
 co-Chair, Steering Comm. for ACM Symposium on Computational Geometry, 1999–2001  
 Member, Steering Comm. for Graph Drawing Conference, 2000–2003  
 Conference Chair, ACM SIG on Algorithms & Comp. Theory (SIGACT), 2005–2009

*Review Panelist:*

National Science Foundation, 2000, 2006, 2009, 2010

*Ph.D. Advisees:*

Mujtaba Ghouse	“Randomized Parallel Computational Geometry in Theory and Practice,” May 1993.
Paul Tanenbaum	“On Geometric Representations of Partially Ordered Sets,” May 1995 (co-advised with Prof. Edward Scheinerman).
Mark Orletsky	“Practical Methods for Geometric Searching Problems with Experimental Validation,” May 1996.
Kumar Ramaiyer	“Geometric Data Structures and Applications,” Aug. 1996.
Christian Duncan	“Balanced Aspect Ratio Trees,” Aug. 1999.
Christopher Wagner	“Graph Visualization and Network Routing,” Oct. 1999 (co-advised with Prof. Lenore Cowen).
Stephen Kobourov	“Algorithms for Drawing Large Graphs,” May 2000.
Amitabha Bagchi	“Efficient Strategies for Topics in Internet Algorithmics,” Oct. 2002.
Amitabh Chaudhary	“Applied Spatial Data Structures for Large Data Sets,” Oct. 2002.
Jeremy Yu Meng	“Confluent Graph Drawing,” June 2006.
Jonathan Zheng Sun	“Algorithms for Hierarchical Structures, with Applications to Security and Geometry,” August 2006.
Nodari Sitchinava	“Parallel External Memory Model—A Parallel Model for Multi-core Architectures,” Sept. 2009.
Darren Strash	“Algorithms for Sparse Geometric Graphs and Social Networks,” May 2011.

*Ph.D. Committee Service:*

John Augustine	UC-Irvine	Advancement to candidacy, September 2003
Nikos Triandopoulos	Brown U.	Thesis prelim., February 2004
Einar Mykletun	UC-Irvine	Advancement to candidacy, March 2004
Kartic Subr	UC-Irvine	Advancement to candidacy, September 2004
S. Joshua Swamidass	UC-Irvine	Advancement to candidacy, April 2005
Jeong Hyun Yi	UC-Irvine	Thesis defense, August, 2005
Nodari Sitchinava,	UC-Irvine,	Advancement to candidacy, chair, December 2005
John Augustine	UC-Irvine	Thesis defense, July 2006
Maithili Narasimha	UC-Irvine	Thesis defense, August, 2006
Josiah Carlson,	UC-Irvine,	Advancement to candidacy, August 2006
Xiaomin Liu	UC-Irvine	Advancement to candidacy, September 2006
Gabor Madl	UC-Irvine	Advancement to candidacy, September 2006
Nikos Triandopoulos	Brown U.	Thesis defense, September 2006
Rabia Nuray-Turan	UC-Irvine	Advancement to candidacy, May 2007
S. Joshua Swamidass	UC-Irvine	Thesis defense, June 2007
Michael Sirivianos	UC-Irvine	Advancement to candidacy, June 2007
Kevin Wortman	UC-Irvine	Advancement to candidacy, August 2007
Di Ma	UC-Irvine	Advancement to candidacy, December 2007
Josiah Carlson	UC-Irvine	Thesis defense, December 2007
Michael Nelson	UC-Irvine	Advancement to candidacy, chair, March 2008
Minas Gjoka	UC-Irvine	Advancement to candidacy, June 2008
Sara Javanmardi	UC-Irvine	Advancement to candidacy, June 2008
Ali Zandi	UC-Irvine	Advancement to candidacy, September 2008
Jihye Kim	UC-Irvine	Thesis defense, September 2008
Darren Strash	UC-Irvine	Advancement to candidacy, December 2008
Kevin Wortman	UC-Irvine	Topic defense, January 2009
Nodari Sitchinava	UC-Irvine	Topic defense, chair, June 2009
Fabio Soldo	UC-Irvine	Advancement to candidacy, July 2009
Emil De Cristofaro	UC-Irvine	Advancement to candidacy, July 2009
Di Ma	UC-Irvine	Thesis defense, August 2009
Yanbin Lu	UC-Irvine	Advancement to candidacy, December 2009
Anh Le	UC-Irvine	Advancement to candidacy, April 2010
Lowell Trott	UC-Irvine	Advancement to candidacy, June 2010
Xiaomin Liu	UC-Irvine	Thesis defense, August 2010
Josh Olsen	UC-Irvine	Advancement to candidacy, September 2010
Yasser Altowim	UC-Irvine	Advancement to candidacy, December 2010
Angela Wong	UC-Irvine	Advancement to candidacy, May 2011
Joshua Hill	UC-Irvine	Advancement to candidacy, September 2011
Alex Abatzoglou	UC-Irvine	Advancement to candidacy, September 2011
Michael Wolfe	UC-Irvine	Masters Thesis defense, October 2011
Olya Ohrimenko	Brown Univ.	PhD Thesis proposal, October 2011
Yanbin Lu	UC-Irvine	PhD Thesis defense, November 2011
Chun Meng	UC-Irvine	Advancement to candidacy, December 2011

*University Service:*

Ph.D. Requirements Committee, Dept. of Computer Science, chair: 1987–89

Graduate Admissions Committee, Dept. of Computer Science, 1991–1993 (chair: 1992)  
Faculty Recruiting Committee, Dept. of Computer Science, 1993,95,96 (chair: 1996)  
Steering Committee, Whiting School of Engineering, 1990–93 (chair, 1993)  
Johns Hopkins Homewood Academic Computing Oversight Committee, 1990–93  
Curriculum Committee, Whiting School of Engineering, 1994–96  
Strategic Planning Committee, Whiting School of Engineering, 1999–00  
Graduate Policy Committee, UCI Dept. of Information & Computer Science (ICS), 2001–02  
Faculty Search Committee in Cryptography, UCI Dept. of ICS, 2001–03  
School of Info. and Computer Science Executive Committee, 2002–04  
UCI Committee on Educational Policy (CEP), 2002–03, 2004–06  
UCI Change of Major Criteria Committee, 2002–03  
UCI CEP Policy Subcommittee, 2002–2003  
Distinguished Faculty Search Committee, Bren School of ICS, 2004–11 (chair, 2007–08)  
Equity Advisor, Bren School of ICS, 2005–09  
Dean’s Advisory Council, Bren School of ICS, 2007–  
Associate Dean for Faculty Development, Bren School of ICS, 2006–

*Courses Taught and Developed:*

Cyber-Puzzlers (designed and taught at UCI)  
Computer Literacy (taught at Purdue, developed at Hopkins)  
Computer Programming for Scientists and Engineers (taught at Purdue)  
Computer Security Algorithms (developed and taught at UCI)  
Computational Models (revised and taught at Hopkins)  
Compiler Theory and Design (revised and taught at Hopkins)  
Computer Graphics (taught at Hopkins)  
Data Structures (revised and taught at Hopkins and UCI)  
Graph Algorithms (revised and taught at UCI)  
Introduction to Algorithms (developed and taught at Hopkins and UCI)  
Internet Algorithmics (developed and taught at Hopkins, Brown, and UCI)  
Design and Analysis of Algorithms (revised and taught at Hopkins and UCI)  
Computational Geometry (revised and taught at Hopkins and UCI)  
Parallel Algorithms (developed and taught at Hopkins and Univ. of Illinois)  
Cyber-Fraud Detection and Prevention (designed and taught at UCI)  
Advanced Parallel Computing (developed and taught at Hopkins)

*Consulting:*

APAC Security, Inc.  
Algomagic Technologies, Inc.  
Army Research Laboratory, Fort Belvoir  
AT&T  
Battelle Research Triangle, Columbus Division  
Brown University  
Walt Disney Animation Studios  
Purdue University  
Univ. of Miami

*Corporate Service:*

Board member, Algomagic Technologies, Inc., 1998–2003

## GRANTS AND CONTRACTS

1. PI, “Research Initiation Award: Parallel and Sequential Computational Geometry,” National Science Foundation (NSF Grant CCR-8810568), \$32,914, 1988–90.
2. co-PI, “Paradigms for Parallel Algorithm Design,” NSF and DARPA (as NSF Grant CCR-8908092), \$523,837, 1989–93 (with S.R. Kosaraju (PI), S. Kasif, and G. Sullivan).
3. PI, “Parallel Computation and Computational Geometry,” NSF (Grant CCR-9003299), \$67,436, 1990–93.
4. co-PI, “A Facility for Experimental Validation,” NSF (Grant CDA-9015667), \$1,476,147, 1991–96 (with G. Masson (PI), J. Johnstone, S. Kasif, S.R. Kosaraju, S. Salzberg, S. Smith, G. Sullivan, L. Wolff, and A. Zwarico).
5. PI, “Parallel Network Algorithms for Cell Suppression,” The Bureau of the Census (JSA 91-23), \$14,998 1991–92.
6. PI, “A Geometric Framework for the Exploration & Analysis of Astrophysical Data,” NSF (Grant IRI-9116843), \$535,553, 1991–96 (with S. Salzberg and H. Ford (from Physics and Astronomy Dept.)).
7. PI, “Research Experiences for Undergraduates supplement to IRI-9116843,” NSF, \$4,000, 1993–94 (with S. Salzberg and H. Ford).
8. PI, “Constructing, Maintaining, and Searching Geometric Structures,” NSF (Grant CCR-9300079), \$134,976, 1993–96.
9. co-PI, “Robust and Applicable Geometric Computing,” Army Research Office (ARO MURI Grant DAAH04-96-1-0013), \$4,500,000, 1996–2000 (with F. Preparata (PI, Brown U.), R. Tamassia (Brown U.), S. Rao Kosaraju, J. Vitter (Duke U.), and P. Agarwal (Duke U.)). Subaward size: \$1,466,640.
10. PI, “Application-Motivated Geometric Algorithm Design,” NSF (Grant CCR-9625289), \$107,389, 1996–98.
11. co-PI, “vBNS Connectivity for the Johns Hopkins University,” NSF, \$350,000, 1997–99 (with T.O. Poehler (PI), D.J. Binko, J.G. Neal, and A.S. Szalay).
12. co-PI, “Product Donation, Technology for Education Program,” Intel Corporation, \$480,071, 1997–2001 (with T.O. Poehler (PI), J.H. Anderson, A.S. Szalay, and M. Robbins).
13. co-PI, “A Networked Computing Environment for the Manipulation & Visualization of Geometric Data” (Research Infrastructure), NSF, \$1,638,785, 1997–2003 (with L.B. Wolff (PI), Y. Amir, S.R. Kosaraju, S. Kumar, R. Tamassia (Brown U.), R.H. Taylor, and D. Yarowsky).
14. PI, “Geometric Algorithm Design and Implementation,” NSF, Grant CCR-9732300, \$224,982, 1998–2002.
15. PI, “Certification Management Infrastructure – Certificate Revocation,” \$52,023, 1998, NSA LUCITE grant.
16. PI, “Software Engineering Data Loading, Analysis, and Reporting,” \$41,614, 1998, NSA LUCITE grant.
17. PI, “Establishing a LUCITE Collaboration Environment,” \$10,018, 1998, NSA LUCITE grant.
18. PI, “In Support of a Secure Multilingual Collaborative Computing Environment,” \$51,471, 1999–2000, NSA LUCITE grant.
19. PI, “Accessing Large Distributed Archives in Astronomy and Particle Physics,” \$199,981. subcontract to UCI from Johns Hopkins Univ. on NSF Grant PHY-9980044 (total budget,

- \$2,500,000), 1999–2004.
20. PI, “Efficient and Scalable Infrastructure Support for Dynamic Coalitions,” \$1,495,000, DARPA Grant F30602-00-2-0509, 2000-2003 (with Robert Cohen and Roberto Tamassia), including \$227,893 subaward to UCI (with Gene Tsudik).
  21. PI, “Graph Visualization and Geometric Algorithm Design,” \$400,000, NSF Grant CCR-0098068, 2001-2004 (with Roberto Tamassia).
  22. PI, “Collaborative Research: Teaching Data Structures to the Millennium Generation,” \$125,00, NSF Grant DUE-0231467, 2003–2005.
  23. PI, “Collaborative Research: An Algorithmic Approach to Cyber-Security,” \$100,000, NSF Grant CCR-0311720, 2003–2006.
  24. PI, “The OptIPuter,” \$900,000, subcontract from UCSD on NSF ITR grant CCR-0225642 (total budget, \$13.5 million), 2002–2007 (with Padhraic Smyth and Kane Kim).
  25. PI, “ITR: Algorithms for the Technology of Trust,” \$300,000, NSF Grant CCR-0312760, 2003–2009.
  26. co-PI, “SDCI Data New: Trust Management for Open Collaborative Information Repositories: The CalSWIM Cyberinfrastructure,” NSF grant OCI-0724806, \$1,103,590, 2007–2010.
  27. PI, “IPS: Collaborative Research: Privacy Management, Measurement, and Visualization in Distributed Environments,” NSF Grant IIS-0713046, \$224,851, 2007–2009.
  28. PI, “Collaborative Research: Algorithms for Graphs on Surfaces,” \$400,000, NSF Grant CCR-0830403, 2008–2011.
  29. PI, “ROA Supplement: IPS: Collaborative Research: Privacy Management, Measurement, and Visualization in Distributed Environments,” NSF Grant IIS-0847968, \$25,000, 2008–2009.
  30. co-investigator, “Scalable Methods for the Analysis of Network-Based Data,” Office of Naval Research: Multidisciplinary University Research Initiative (MURI) Award, number N00014-08-1-1015, \$529,152, 2008–2013.
  31. PI, “EAGER: Usable Location Privacy for Mobile Devices,” NSF Grant 0953071, \$300,000, 2009–2011.
  32. PI, “TC:Large:Collaborative Research: Towards Trustworthy Interactions in the Cloud,” NSF Grant 1011840, \$500,000, 2010-2015.

#### **SELECTED INVITED TALKS (RECENT YEARS ONLY)**

- “Probabilistic Packet Marking for Large-Scale IP Traceback,” Purdue Univ., 2003
- “Algorithms for Data Authentication,” Harvey Mudd College, 2003
- “Efficient Tree-Based Revocation in Groups of Low-State Devices,” Univ. of Arizona, 2004
- “Leap-Frog Packet Linking and Diverse Key Distributions for Improved Integrity in Network Broadcasts,” Southern California Security and Cryptography Workshop, 2005
- “Is Your Business Privacy Protected?,” NEXT Connections, 2005
- “Distributed Peer-to-peer Data Structures,” Harvard Univ., 2006
- “Balancing Life with an Academic Research Career,” Grace Hopper Conference, 2006
- “Computer Security in the Large,” Univ. Texas, San Antonio, 2006
- “Inspirations in Parallelism and Computational Geometry,” Brown Univ., 2006
- “Efficiency and Security Issues for Distributed Data Structures,” Computer Science Distinguished Lecture Series, Johns Hopkins Univ., 2006
- “Efficiency and Security Issues for Distributed Data Structures,” UCLA, 2006

- “Efficiency and Security Issues for Distributed Data Structures,” Edison Distinguished Lecturer Series, Univ. of Notre Dame, 2006
- “Efficiency and Security Issues for Distributed Data Structures,” Computer Science Distinguished Lecturer Series, Texas A & M Univ., 2006
- “Algorithms for Secure Computing and Searching with Applications to Medical Informatics,” Purdue Univ., 2006
- “Blood on the Computer: How Algorithms for Testing Blood Samples can be Used for DNA Sequencing, Wireless Broadcasting, and Network Security,” Univ. of Southern California, 2007
- “Blood on the Computer: How Algorithms for Testing Blood Samples can be Used for DNA Sequencing, Wireless Broadcasting, and Network Security,” Univ. California, San Diego, 2007
- “Blood on the Computer: How Algorithms for Testing Blood Samples can be Used for DNA Sequencing, Wireless Broadcasting, and Network Security,” Univ. Minnesota, 2007
- “Blood on the Database: How Algorithms for Testing Blood Samples can be Used for Database Integrity,” Invited Keynote, 21st Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec), 2007
- “Space-Efficient Straggler Identification,” ALCOM Seminar, Univ. of Aarhus, 2007
- “Blood on the Computer: How Algorithms for Testing Blood Samples can be used in Modern Applications,” ALCOM Seminar, Univ. of Aarhus, 2007
- “Studying Road Networks Through an Algorithmic Lens,” ALCOM Seminar, Univ. of Aarhus, 2008
- “Studying Geometric Graph Properties of Road Networks Through an Algorithmic Lens,” International Workshop on Computing: from Theory to Practice, 2009
- “Randomized Shellsort: A Simple Oblivious Sorting Algorithm,” Distinguished Lecture Series, Department of Computer Science, Brown University, 2009
- “Simulating Parallel Algorithms in the MapReduce Framework with Applications to Parallel Computational Geometry,” MASSIVE 2010
- “Data Cloning Attacks for Nearest-Neighbor Searching based on Retroactive Data Structures,” Department of Computer Science, UCSB, 2011
- “Turning Privacy Leaks into Floods: Surreptitious Discovery of Social Network Friendships and Other Sensitive Binary Attribute Vectors,” Department of Computer Science Distinguished Lecturer Series, Univ. of Illinois, Chicago, 2011.
- “Turning Privacy Leaks into Floods: Surreptitious Discovery of Social Network Friendships and Other Sensitive Binary Attribute Vectors,” Department of Computer Sciences, Purdue Univ., 2011

## **PROFESSIONAL SOCIETY MEMBERSHIPS**

American Association for the Advancement of Science (AAAS), Fellow  
 IEEE and IEEE Computer Society, Fellow  
 Association for Computing Machinery (ACM), Fellow