# CURRICULUM VITAE

**Michael T. Goodrich**

Dept. of Computer Science
Bren School of Info. & Computer Sciences
University of California, Irvine
Irvine, CA 92697-3435

E-mail: goodrich (at) ieee.org
http://www.ics.uci.edu/~goodrich/
Phone: (949)824-9366
Fax: (949)824-4056

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

## EDUCATION

| | | |
|---|---|---|
| Ph.D. | 1987 | *Efficient Parallel Techniques for Computational Geometry*<br>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

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|---|---|
| April '07 to present | Chancellor's Professor, Dept. of Computer Science<br>Univ. of California, Irvine |
| July '12 to June '13 | Chair, Dept. of Computer Science<br>Univ. of California, Irvine |
| October '06 to June '12 | Assoc. Dean for Faculty Dev., Bren School of Info. and Comp. Sci.<br>Univ. of California, Irvine |
| July '01 to March '07 | Professor, Dept. of Computer Science<br>Univ. of California, Irvine |
| Fall '00 | Visiting Professor of Computer Science<br>Brown Univ. |
| July '96 to June '02 | Professor of Computer Science (on leave, from July '01)<br>Johns Hopkins Univ. |
| July '92 to June '96 | Associate Professor of Computer Science<br>Johns Hopkins Univ. |
| Spring '94 | Visiting Associate Professor of Computer Science<br>Univ. of Illinois, Urbana-Champaign |
| July '87 to June '92 | Assistant Professor of Computer Science<br>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

- *Compere 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
- *ICS Dean's Award for Research*, "for his contributions in the area of parallel and distributed algorithms," 2014

## PUBLICATIONS

### Patents and Patent Applications:

P-1. G. Ateniese, B. de Medeiros, and M.T. Goodrich, "Intermediated Delivery Scheme for Asymmetric Fair Exchange of Electronic Items," U.S. Patent Application US 2004/0073790 A1, April 15, 2004.

P-2. 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-3. 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-4. R. Tamstorf, M.T. Goodrich, D. Eppstein, "Attribute Transfer Between Computer Models Including Identifying Isomorphic Regions in Polygonal Meshes," U.S. Patent 8,681,145, March 25, 2014.

### 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.

B-12. M.T. Goodrich, R. Tamassia, and M. Goldwasser, *Data Structures and Algorithms in Python*, John Wiley and Sons, Inc., 2013.

B-13. M.T. Goodrich, R. Tamassia, and M. Goldwasser, *Data Structures and Algorithms in Java, Sixth Edition*, John Wiley and Sons, Inc., 2014.

**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*, CRC Press, Inc., 223–246, 2013.

**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*,

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