Curriculum Vitae

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Education

- 96 Ph.D. Computer Science, Brown University
- 92 Sc. M., Computer Science, Brown University
- 90 B.E. (Hons.), Computer Science, Roorkee University, India

Research Interests

Information Visualization. Graph Visualization. Computational Geometry. Human-computer Interaction. User Interfaces. Design and Analysis of Algorithms. Data structures. Experimental Algorithms. Geometric Computing.

Professional Appointments

- 97- Assistant Professor, Department of Computer Science and Engineering, State University of New York at Buffalo, Bufffalo, NY.
- 96-97 Postdoctoral Research Associate, Department of Computer Sc., Brown Univ., Providence, RI.
- 94 Member of the Advanced Development Group, Cadre Technologies Inc., Providence, RI.
- 91-95 Teaching and Research Assistant, Department of Computer Sc., Brown Univ., Providence, RI.
- 89 Engineer Trainee, UPTRON India Limited, Lucknow, India.

Awards and Honors

- 00– NSF CAREER Award
- 90–91 Fellowship, Brown University
- 86–90 Merit Scholarship, University of Roorkee, India
- 84–86 State Scholarship, State of Uttar Pradesh, India

Research Grants

[1] "CISE Research Infrastructure–Multistore: A Research Infrastructure for Manaagement, Analysis, and Visualization of Large Scale Multi-dimensional Datasets", NSF, $1,591,961 (with UB Matching), 9/2001–8/2006. PI: Aidong Zhang. Role: Co-PI, responsible for developing fundamental visualization techniques.

[2] "CAREER: Information Visualization Research and Education", NSF, $200,000, 10/2000–9/2004.

[3] Reifler Award, University at Buffalo, $250, Summer 1999.

[4] Reifler Award, University at Buffalo, $500, Summer 1998.

Refereed Publications

Journals

[1] A. Garg and R. Tamassia, "On the Computational Complexity of Upward and Rectilinear Planarity Testing", *SIAM Journal on Computing*, Volume 31, No. 2, 2001, pp. 601-625.

[2] G. Di Battista, A. Garg, G. Liotta, A. Parise, R. Tamassia, E. Tassinari, F. Vargiu, and L. Vismara, "Drawing Directed Graphs: An Experimental Study", *International Journal of Computational Geometry and Applications (IJCGA)*, Volume 10, No. 6 (2000), pp. 623–648.

[3] L. Vismara, G. Di Battista, A. Garg, G. Liotta, R. Tamassia, and F. Vargiu, "Experimental Studies on Graph Drawing Algorithms", *Software Practice & Experience*, special issue on Discrete Algorithm Engineering, K. Weihe and D. Wagner, eds., Vol. 30, Number 11, 2000, pp. 1235–1284.

[4] S. Bridgeman, A. Garg, and R. Tamassia, "A Graph Drawing and Translation Service on the WWW", *International Journal of Computational Geometry and Applications (IJCGA)*, Vol. 9, No. 4–5, 1999, pp. 419–446.

[5] A. Garg, "New Results on Drawing Angle Graphs", *Computational Geometry: Theory and Applications (CGTA)*, special issue on Geometric Representations of Graphs, Vol. 9, Nos 1–2, January 1998, pp. 43–82.

[6] G. Di Battista, A. Garg, G. Liotta, R. Tamassia, E. Tassinari, and F. Virgiu, "An Experimental Comparison of Four Graph Drawing Algorithms", *Computational Geometry: Theory and Applications (CGTA)*, Vol. 7, Nos. 5–6, April 1997, pp. 303–325.

[7] A. Garg, M.T. Goodrich and R. Tamassia, "Planar Upward Tree Drawings with Optimal Area," *International Journal of Computational Geometry and Applications (IJCGA)*, 6(3), 1996, pp. 333–356.

[8] A. Garg and R. Tamassia, "Upward Planarity Testing", *Order*, Vol. 12, No. 2, 1995, pp. 109–133.

Submitted

[9] A. Garg and A. Rusu, "Straight-line Drawings of Binary Trees with Linear Area and Good Aspect Ratio", Invited submission to *Journal of Graph Algorithms and Applications (JGAA)*, special issue on selected papers from 10^{th} International Symposium on Graph Drawing, 2002.

[10] A. Garg and A. Rusu, "Area-Efficient Order-Preserving Planar Straight-Line Drawings of Ordered Trees", submitted to *International Journal of Computational Geometry and Applications (IJCGA)*.

[11] R.C. Chuang, A. Garg, X. He, M.Y. Kao and H. Lu, "Compact Encoding of Planar Graphs via Canonical Orderings and Multiple Parentheses", submitted to *SIAM Journal on Discrete Mathematics*.

Conferences

[12] A. Garg and A. Rusu, "Straight-line Drawings of General Trees with Linear Area and Arbitrary Aspect Ratio", Proc. 2003 International Conference on Computational Science and Its Applications (ICCSA 2003), to appear.

[13] A. Garg and A. Rusu, "Area-Efficient Order-Preserving Planar Straight-Line Drawings of Ordered Trees", Proc. 9^{th} International Computing and Combinatorics Conference (COCOON), 2003, Lecture Notes in Computer Science, Vol. 2697, to appear.

[14] A. Garg and A. Rusu, "Straight-line Drawings of Binary Trees with Linear Area and Good Aspect Ratio", Proc. 10^{th} International Symposium on Graph Drawing 2002, Lecture Notes in Computer Science, Vol. 2528, Springer-Verlag, 2002, pp. 320–331.

[15] A. Chanda and A. Garg, "Compact Encodings of Planar Orthogonal Drawings", Proc. 10^{th} International Symposium on Graph Drawing 2002, Lecture Notes in Computer Science, Vol. 2528, Springer-Verlag, 2002, pp. 174–185.

[16] A. Garg and G. Liotta "Almost Bend-Optimal Planar Orthogonal Drawings of Biconnected Degree-3 Planar Graphs in Quadratic Time", *Proc. Graph Drawing '99*, Lecture Notes in Computer Science, Vol. 1731, Springer-Verlag, 1999, pp. 38–48.

[17] R.C. Chuang, A. Garg, X. He, M.Y. Kao and H. Lu, "Compact Encoding of Planar Graphs via Canonical Orderings and Multiple Parentheses", Proc. International Colloquium on Automata, Languages and Programming (ICALP), Lecture Notes in Computer Sciece, Vol. 1443, Springer-Verlag, 1998, pp. 118–129.

[18] S. Bridgeman, J. Fanto, A. Garg, R. Tamassia, and L. Vismara, "Interactive Giotto: An Algorithm for Interactive Orthogonal Graph Drawing", *Proc. Graph Drawing '97*, Lecture Notes in Computer Science, Vol. 1190, Springer-Verlag, 1998, pp. 303–308.

[19] A. Garg and R. Tamassia, "GIOTTO3D: A System for Visualizing Hierarchical Structures in 3D", *Proc. Graph Drawing '96*, Lecture Notes in Computer Science, Vol. 1190, Springer-Verlag, 1997.

[20] S. Bridgeman, A. Garg, and R. Tamassia, "A Graph Drawing and Translation Service on the WWW", *Proc. Graph Drawing '96*, Lecture Notes in Computer Science, Vol. 1190, Springer-Verlag, 1997, pp. 45–52.

[21] A. Garg, R. Tamassia, and P. Vocca, "Drawing with Colors", *Proc. 4th Annual European Symposium on Algorithms*, 1996, Lecture Notes in Computer Science, Springer-Verlag, Vol. 1136, 1997, pp. 12–26.

[22] A. Garg and R. Tamassia, "A New Minimum Cost Flow Algorithm with Applications to Graph Drawing", *Proc. Graph Drawing '96*, Lecture Notes in Computer Science, Vol. 1190, Springer-Verlag, 1997, pp. 201–216.

[23] G. Di Battista, A. Garg, G. Liotta, R. Tamassia, E. Tassinari, F. Vargiu, and L. Vismara, "Drawing Directed Graphs: An Experimental Study", *Proc. Graph Drawing '96*, Lecture Notes in Computer Science, Vol. 1190, Springer-Verlag, 1997, pp. 76–91.

[24] G. Di Battista, A. Garg, G. Liotta, R. Tamassia, E. Tassinari, and F. Vargiu, "An Experimental Comparison of Three Graph Drawing Algorithms", *Proc. 11th ACM Symp. on Computational Geometry*, 1995, pp. 306–315.

[25] A. Garg and R. Tamassia, "On the Computational Complexity of Upward and Rectilinear Planarity Testing", *Proc. Graph Drawing '94,* Lecture Notes in Computer Science, Vol. 894, Springer-Verlag, 1995, pp. 286–297. Also available as Technical Report No. CS-94-10, Dept. of Computer Science, Brown Univ., 1994.

[26] A. Garg, "On Drawing Angle Graphs", *Proc. Graph Drawing '94,* Lecture Notes in Computer Science, Vol. 894, Springer-Verlag, 1995, pp. 84–95.

[27] I. Cruz and A. Garg, "Drawing Graphs by Example Efficiently: Trees and Planar Directed Acyclic Digraphs", *Proc. Graph Drawing '94,* Lecture Notes in Computer Science, Vol. 894, Springer-Verlag, 1995, pp. 404–415.

[28] A. Garg and R. Tamassia, "Planar Drawings and Angular Resolution: Algorithms and Bounds", *Proc. 2nd Annual European Symposium on Algorithms*, 1994, Lecture Notes in Computer Science, Springer-Verlag, 1994, pp. 12–23.

[29] A. Garg and R. Tamassia, "Advances in Graph Drawing", *Proc. Second Italian Conference on Algorithms and Complexity, 1994*, Lecture Notes in Computer Science, Vol. 778, Springer-Verlag, 1994, pp. 12–21.

[30] A. Garg, M.T. Goodrich, and R. Tamassia, "Area-Efficient Upward Tree Drawings," *Proc. ACM Symp. on Computational Geometry*, 1993, pp. 359–368.

Other Publications

[31] A. Garg, "Interactive Graph Drawing", Abstract in *Third CGC Workshop on Computational Geometry (CGC '98)*, Providence, RI, 1998.

[32] A. Garg and R. Tamassia, "Efficient Computation of Planar Straight-Line Upward Drawings," Abstract in *Graph Drawing '93,* Available via Anonymous FTP from *ftp.cs.brown.edu: /pub/papers/compgeo/gd93-v2.tex.Z.*

Talks and Presentations

[1] "Compact Encodings of Planar Orthogonal Drawings", *Graph Drawing '02*, Irvine, CA, August 26–28, 2002.

[2] "Almost Bend-Optimal Planar Orthogonal Drawings of Biconnected Degree-3 Planar Graphs in Quadratic Time", *Graph Drawing '99*, Prague, Czech Republic, September 15–19, 1999.

[3] "Interactive Graph Drawing", *Third CGC Workshop on Computational Geometry (CGC '98)*, Brown University, Providence, RI, October 11–12, 1998.

[4] "Interactive Giotto: An Algorithm for Interactive Orthogonal Graph Drawing", *Graph Drawing '97*, Rome, Italy, September 18–20, 1997.

[5] "GIOTTO3D: A System for Visualizing Hierarchical Structures in 3D", *Graph Drawing '96*, Berkeley, CA, 1996.

[6] "A New Minimum Cost Flow Algorithm with Applications to Graph Drawing", *Graph Drawing '96*, Berkeley, CA, 1996.

[7] "On the Computational Complexity of Upward and Rectilinear Planarity Testing", *Graph Drawing '94,*, Princeton, NJ, October 10–12, 1994.

[8] "On Drawing Angle Graphs", *Graph Drawing '94,*, October 10–12, Princeton, NJ, 1994.

[9] "Area-Efficient Upward Tree Drawings," *ACM Symposium on Computational Geometry*, San Diego, CA, May 19–21, 1993.

Professional Services

[1] Member, Program Committee, 11^{th} International Symposium on Graph Drawing 2003, Perugia, Italy, September 21–24, 2003.

[2] Session Chair, 8^{th} International Symposium on Graph Drawing, Colonial Williamsburg, Virginia, September 20–23, 2000.

[3] Member, Program Committee,8^{th} International Symposium on Graph Drawing, Colonial Williamsburg, Virginia,
September 20–23, 2000.

[4] Session Chair, *Dagstuhl Seminar on Graph Algorithms and Applications*, Wadern, Germany, July 27–31, 1998.

[5] Session Chair, 5^{th} International Symposium on Graph Drawing, Rome, Italy, September 18–20, 1997.

[6] Reviewer for the National Science Foundation.

[7] Reviewer for the following journals and conferences:

[1] ACM Journal of Experimental Algorithms
[2] Algorithmica
[3] Computational Geometry: Theory and Applications
[4] IEEE Transactions on Computers
[5] Information Processing Letters
[6] International Journal of Computational Geometry and Applications
[7] Journal of Graph Algorithms and Applications
[8] Journal of Visual Languages
[9] Software – Practice & Experience
[10] Theoretical Computer Science
[11] World Wide Web
[12] 11^{th} International Symposium on Graph Drawing, 2003
[13] 8^{th} International Symposium on Graph Drawing, 2000
[14] International Colloq. on Automata, Languages & Programming (ICALP), 1997
[15] 5^{th} International Symposium on Graph Drawing, 1997
[16] International Computing and Combinatorics Conference (COCOON), 1997
[17] Eleventh ACM Symposium on Computational Geometry, 1995
[18] International Workshop on Constraints for Graphics and Visualization, 1995
[19] Sixth Annual Int. Symposium on Algorithms and Computation (ISAAC '95)
[20] International Workshop on Advanced Visual Interfaces (AVI '94)
[21] Third Workshop on Algorithms and Data Structures (WADS '93)