

Curriculum Vitae

Stephen G. Kobourov

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Education

- 2000 PhD Computer Science, Johns Hopkins University
Thesis: Visualization of Large Graphs; Advisor: Michael T. Goodrich
- 1997 MS Computer Science, Johns Hopkins University
- 1995 BS Computer Science, Mathematics, *Summa Cum Laude*, Dartmouth College

Professional Experience

- 2006 – present Associate Professor, Computer Science, University of Arizona
- 2000 – 2006 Assistant Professor, Computer Science, University of Arizona
- 2011 – 2012 Alexander von Humboldt Fellow, Universität Tübingen, Germany
- 2008 – 2009 Research Scientist, AT&T Research Labs, Florham Park, New Jersey
- 2006 – 2007 Fulbright Scholar, Computer Science, University of Botswana
- 1999 – 2000 Visiting Instructor, Computer Science, Dartmouth College

Research Interests

Graph and Geometric Algorithms
Information Visualization

Honors, Awards, and Memberships

- Humboldt Research Fellow, Alexander von Humboldt Foundation, Germany 2011-2012
- Best Paper Award, 22nd International Symposium on Algorithms and Computation (ISAAC), 2011
- Faculty Impact Award, University of Arizona, 2007
- Fulbright Scholar, US Department of State, 2006-2007
- National Science Foundation CAREER Award, 2005-2011
- First Prize in the 7th Annual Graph Drawing Contest, 2000
- Fred Demerritte Graduate Studies Fellowship, Johns Hopkins University 1995-1998
- Brainerd Memorial Scholarship (full undergraduate studies scholarship), Dartmouth College, 1992-95
- Member of the Phi Beta Kappa Honor Society

Books and Monographs

1. M. T. Goodrich and S. G. Kobourov, editors, *Proceedings of the 10th International Symposium on Graph Drawing (GD)*, Lecture Notes in Computer Science, vol. 2528, Springer-Verlag, 2002.
2. H. Hauser, S. G. Kobourov, H. Qu, editors, *Proceedings of the 5th IEEE Pacific Visualization Symposium (PacificVis)*, Songdo, Korea, February 28 - March 2 2012, IEEE Press, 2012.
3. S. G. Kobourov, “Force-Directed Drawing Algorithms,” In Roberto Tamassia (editor), *Handbook of Graph Drawing and Visualization*, CRC Press, Accepted, to appear in 2012.

Refereed Journal Publications (authors in alphabetical order)

4. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Balanced Aspect Ratio Trees and Their Use for Drawing Large Graphs,” *Journal of Graph Algorithms and Applications*, vol. 4, p. 19–46, 2000. (Invited to this special issue on best papers from GD’98.)
5. C. C. Cheng, C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Drawing Planar Graphs with Circular Arcs,” *Discrete & Computational Geometry*, vol. 25, p. 405–418, 2001.

6. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, "Balanced Aspect Ratio Trees: Combining the Advantages of k -d Trees and Octrees," *Journal of Algorithms*, vol. 38, p. 303–333, 2001. (Invited to this special issue on best papers from SODA'99.)
7. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, "Planarity-Preserving Clustering and Embedding for Large Planar Graphs," *Computational Geometry: Theory and Applications*, vol. 24, no. 3, p. 95–114, 2002. (Invited to this special issue on the best papers from GD'99.)
8. P. Gajer and S. G. Kobourov, "GRIP: Graph Drawing with Intelligent Placement," *Journal of Graph Algorithms and Applications*, vol. 6, no. 3, p. 203–224, 2002. (Invited to this special issue on the best papers from GD'2000.)
9. C. A. Duncan and S. G. Kobourov, "Polar Coordinate Drawing of Planar Graphs with Good Angular Resolution," *Journal of Graph Algorithms and Applications*, vol. 7, no. 4, p. 311–333, 2003. (Invited to this special issue on the best papers from GD'2001.)
10. 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*, vol. 29, no. 1, p. 3–18, 2004. (Invited to this special issue on the best papers from CGC'2001.)
11. T. Biedl, E. Demaine, C. A. Duncan, R. Fleischer, and S. G. Kobourov, "Tight Bounds on Maximal and Maximum Matching," *Journal of Discrete Mathematics*, vol. 285, no. 1, p. 7–15, 2004.
12. C. Collberg and S. G. Kobourov, "Self-Plagiarism in Computer Science," *Communications of the ACM*, vol. 48, no. 4, p. 88–94, 2005.
13. C. Erten and S. G. Kobourov, "Simultaneous Embedding of a Planar Graph and Its Dual on the Grid," *Theory of Computing Systems*, vol. 38, no. 3, p. 313–327, 2005. (Invited to this special issue on the best papers from ISAAC 2002).
14. C. Erten, S. G. Kobourov, V. Le, and A. Navabi, "Simultaneous Graph Drawing: Layout Algorithms and Visualization Schemes," *Journal of Graph Algorithms and Applications*, vol. 9, no. 1, p. 165–182, 2005. (Invited to this special issue on the best papers from GD'2003.)
15. S. G. Kobourov and K. Wampler, "Non-Euclidean Spring Embedders," *IEEE Transactions on Visualization and Computer Graphics*, vol. 11, no. 6, p. 757–767, 2005.
16. C. Erten and S. G. Kobourov, "Simultaneous Embedding of Planar Graphs with Few Bends," *Journal of Graph Algorithms and Applications*, vol. 9, no. 3, p. 347–364, 2006. (Invited to this special issue on the best papers from GD'2004.)
17. C. A. Duncan, A. Efrat, S. G. Kobourov, and C. Wenk, "Drawing Graphs with Fat Edges," *International Journal of Foundations of Computer Science*, vol. 17, no. 5, p. 1143–1165, 2006. (Invited to this special issue on graph drawing.)
18. A. Efrat, S. G. Kobourov, and A. Lubiw, "Computing Homotopic Shortest Paths Efficiently," *Computational Geometry: Theory and Applications*, vol. 35, no. 3, p. 162–172, 2006.
19. P. Brass, E. Cenek, C. A. Duncan, A. Efrat, C. Erten, D. Ismailescu, S. G. Kobourov, A. Lubiw, and J. S. B. Mitchell, "On Simultaneous Planar Graph Embeddings," *Computational Geometry: Theory and Applications*, vol. 36, no. 2, p. 117–130, 2007.
20. A. Efrat, C. Erten, and S. G. Kobourov, "Fixed-Location Circular-Arc Drawing of Planar Graphs," *Journal of Graph Algorithms and Applications*, vol. 11, no. 1, p. 145–164, 2007.
21. C. A. Duncan, S. G. Kobourov, and V. S. A. Kumar, "Optimal Constrained Graph Exploration," *ACM Transactions on Algorithms*, vol. 2, no. 3, p. 380–402, 2007.
22. S. G. Kobourov and M. Landis, "Morphing Planar Graphs in Spherical Space," *Journal of Graph Algorithms and Applications*, vol. 12, no. 1, p. 113–127, 2008. (Invited to this special issue on the best papers from GD'2006.)
23. J. Cappos, A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, "Simultaneous Graph Embedding with Bends and Circular Arcs," *Computational Geometry: Theory and Applications*, vol. 42, no. 2, p. 173–182, 2008.
24. F. Frati, M. Kaufmann and S. G. Kobourov, "Constrained Simultaneous and Near-Simultaneous Embeddings," *Journal of Graph Algorithms and Applications*, vol. 13, no. 3, p. 447–465, 2009, (Invited to this special issue on the best papers from GD'2007.)

25. A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, “Characterization of Unlabeled Level Planar Trees”, *Computational Geometry: Theory and Applications*, vol. 42, no. 6, p. 704-721, 2009.
26. C. Binucci, E. Di Giacomo, W. Didimo, A. Estrella-Balderrama, F. Frati, S. G. Kobourov, G. Liotta, “Upward Straight-line Embeddings of Directed Graphs into Point Sets,” *Computational Geometry: Theory and Applications*, vol. 43, no. 2, p. 219-232, 2010.
27. A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, “GraphSET, a tool for simultaneous graph drawing,” *Software: Practice and Experience*, vol. 10, no. 40, p. 849-863, 2010.
28. C. Erten, A. Efrat, D. Forrester, A. Iyer, and S. G. Kobourov, “Force-Directed Approaches to Sensor Localization,” *IEEE Transaction on Sensor Networks*, vol. 7, no. 3, p. 1-25, 2010.
29. E. Gansner, Y. Hu, and S. G. Kobourov, “Visualizing Graphs and Clusters as Maps,” *IEEE Computer Graphics and Applications*, vol. 30, no. 6, p.54–66, 2010. (Invited to this special issue on the best papers from PacificVis’2010.)
30. J. Fowler, M. Juenger, S. G. Kobourov, and M. Schulz, “Characterizations of Restricted Pairs of Planar Graphs Allowing Simultaneous Embedding with Fixed Edges,” *Computational Geometry: Theory and Applications*, vol. 44, no. 8, p. 385-398, 2011.
31. U. Brandes, C. Erten, A. Estrella-Balderrama, J. Fowler, F. Frati, M. Geyer, C. Gutwenger, S. Hong, M. Kaufmann, S. G. Kobourov, G. Liotta, P. Mutzel, and A. Symvonis, “Colored Simultaneous Geometric Embeddings and Universal Pointsets,” *Algorithmica*, vol. 60, no. 3, p. 569-592, 2011. (Invited to the special issue on the best papers from ACG 07.)
32. C. Duncan, S. G. Kobourov, and M. Goodrich, “Planar Drawings of Higher-Genus Graphs,” *Journal of Graph Algorithms and Applications*, vol. 15, no. 1, p. 7-32, 2011. (Invited to the special issue on the best papers from GD 2009.)
33. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, and M. Nöllenburg, “Lombardi Drawings of Graphs,” *Journal of Graph Algorithms and Applications*, vol. 16, no. 1, p. 85-108, 2011. (Invited to this special issue on the best papers from GD’2010.)
34. E. Gansner, Y. Hu, M. Kaufmann, and S. G. Kobourov, “Optimal Polygonal Representation of Planar Graphs,” *Algorithmica*, Accepted, to appear in 2012. (Invited to this special issue on the best papers from LATIN’2010.)
35. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, and M. Nöllenburg, “Drawing Trees with Perfect Angular Resolution and Polynomial Area,” *Discrete & Computational Geometry*, Accepted, to appear in 2012.
36. Y. Hu, S. G. Kobourov, and D. Mashima, “Visualizing Dynamic Data with Maps,” *IEEE Transactions on Visualization and Computer Graphics*, Accepted, to appear in 2012. (Invited to this special issue on the best papers from PacificVis’2011.)

Refereed Conference Publications (authors in alphabetical order)

37. B. Awerbuch and S. G. Kobourov, “Polylogarithmic-Overhead Piecemeal Graph Exploration,” *11th ACM Conference on Computational Learning Theory (COLT)*, p. 280–286, July 1998.
38. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Balanced Aspect Ratio Trees and Their Use for Drawing Large Graphs,” *6th Symposium on Graph Drawing (GD)*, p. 111–124, 1998. (Prelim. version of 4.)
39. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Planarity-Preserving Clustering and Embedding for Large Planar Graphs,” *7th Symposium on Graph Drawing (GD)*, p. 186–196, 1999. (Prelim. version of 7.)
40. C. C. Cheng, C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Drawing Planar Graphs with Circular Arcs,” *7th Symposium on Graph Drawing (GD)*, p. 117–126, 1999. (Prelim. version of 5.)
41. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Balanced Aspect Ratio Trees: Combining the Advantages of k -d Trees and Octrees,” *10th ACM-SIAM Symposium on Discrete Algorithms, (SODA)*, p. 300–309, 1999. (Prelim. version of 6.)

42. S. Bridgeman, M. T. Goodrich, S. G. Kobourov, and R. Tamassia, "PILOT: An Interactive Tool for Learning and Grading," *31st ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 139–143, March 2000.
43. S. Bridgeman, M. T. Goodrich, S. G. Kobourov, and R. Tamassia, "SAIL: A System for Generating, Archiving, and Retrieving Specialized Assignments Using L^AT_EX," *31st ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 300–304, March 2000.
44. P. Gajer, M. T. Goodrich, and S. G. Kobourov, "A Fast Multi-Dimensional Algorithm for Drawing Large Graphs," *8th Symposium on Graph Drawing (GD)*, p. 211–221, 2000. (Prelim. version of 10.)
45. P. Gajer and S. G. Kobourov, "GRIP: Graph Drawing with Intelligent Placement," *8th Symposium on Graph Drawing (GD)*, p. 222–228, 2000. (Prelim. version of 8.)
46. C. A. Duncan, S. G. Kobourov, and V. S. A. Kumar, "Optimal Constrained Graph Exploration," *12th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, p. 807–814, 2001. (Prelim. version of 21.)
47. C. A. Duncan and S. G. Kobourov, "Polar Coordinate Drawing of Planar Graphs with Good Angular Resolution," *9th Symposium on Graph Drawing (GD)*, p. 407–421, 2001. (Prelim. version of 9.)
48. T. Biedl, E. Demaine, C. A. Duncan, R. Fleischer, and S. G. Kobourov, "Tight Bounds on Maximal and Maximum Matching," *12th International Symposium on Algorithms & Computation (ISAAC)*, p. 308–319, 2001. (Prelim. version of 11.)
49. C. A. Duncan, A. Efrat, S. G. Kobourov, and C. Wenk, "Drawing Graphs with Fat Edges," *9th Symposium on Graph Drawing (GD)*, p. 162–177, 2001. (Prelim. version of 17.)
50. A. Efrat, S. G. Kobourov, M. Stepp, and C. Wenk, "Growing Fat Graphs," *18th ACM Symposium on Computational Geometry (SCG)*, p. 277–278, 2002.
51. C. Collberg, S. G. Kobourov, J. Miller, and S. Westbrook, "AlgoVista: A Tool to Enhance Algorithm Design and Understanding," *7th Symposium on Innovation and Technology in Computer Science Education (ITiCSE)*, p. 228–228, 2002.
52. A. Efrat, S. G. Kobourov, and A. Lubiw, "Computing Homotopic Shortest Paths Efficiently," *10th European Symposium on Algorithms (ESA)*, p. 411–423, 2002. (Prelim. version of 18.)
53. C. Erten and S. G. Kobourov, "Simultaneous Embedding of a Planar Graph and Its Dual on the Grid," *13th International Symposium on Algorithms & Computation (ISAAC)*, p. 575–587, 2002. (Prelim. version of 13.)
54. C. Collberg, S. G. Kobourov, J. Nagra, J. Pitts, and K. Wampler, "A System for Graph-Based Visualization of the Evolution of Software," *ACM Symposium on Software Visualization (SoftVis)*, p. 77–86, 2003.
55. P. Brass, E. Cenek, C. A. Duncan, A. Efrat, C. Erten, D. Ismailescu, S. G. Kobourov, A. Lubiw, and J. S. B. Mitchell, "On Simultaneous Planar Graph Embeddings," *Workshop on Algorithms and Data Structures (WADS)*, p. 243–255, 2003. (Prelim. version of 19.)
56. C. Collberg, S. G. Kobourov, S. Kobes, B. Smith, S. Trush, and G. Yee, "TetraTetris: An Application of Multi-User Touch-Based Interaction using DiamondTouch," *9th International Conference on Human-Computer Interaction (INTERACT)*, p. 81–88, 2003.
57. A. Efrat, H. H. González-Baños, S. G. Kobourov, and L. Palaniappan, "Optimal Motion Strategies to Track and Capture a Predictable Target," *IEEE Conference of Robotics and Automation (ICRA)*, p. 411–423, 2003.
58. C. Collberg, S. G. Kobourov, E. Carter, and C. Thomborson, "Error-Correcting Graphs for Software Watermarking," *29th Workshop on Graph Theoretic Concepts in Computer Science (WG)*, p. 156–167, 2003.
59. C. Collberg, S. G. Kobourov, J. Louie, and T. Slattery, "SPLAT: A System for Self-Plagiarism Detection," *International Conference on WWW/Internet (ICWI)*, p. 508–514, 2003.
60. A. Efrat, C. Erten, and S. G. Kobourov, "Fixed-Location Circular-Arc Drawing of Planar Graphs," *11th Symposium on Graph Drawing (GD)*, p. 147–158, 2003. (Prelim. version of 20.)
61. C. Erten, S. G. Kobourov, and C. Pitta, "Intersection-Free Morphing of Planar Graphs," *11th Symposium on Graph Drawing (GD)*, p. 320–331, 2003.

62. F. Brandenburg, D. Eppstein, M. T. Goodrich, S. G. Kobourov, G. Liotta, and P. Mutzel, “Selected Open Problems in Graph Drawing,” *11th Symposium on Graph Drawing (GD)*, p. 515–539, 2003.
63. C. Erten, S. G. Kobourov, V. Le, and A. Navabi, “Simultaneous Graph Drawing: Layout Algorithms and Visualization Schemes,” *11th Symposium on Graph Drawing (GD)*, p. 437–449, 2003. (Prelim. version of 14.)
64. C. Erten, P. J. Harding, S. G. Kobourov, K. Wampler, and G. Yee, “GraphAEL: Graph Animations with Evolving Layouts,” *11th Symposium on Graph Drawing (GD)*, p. 98–110, 2003.
65. C. Collberg, S. G. Kobourov, and S. Westbrook, “AlgoVista: An Algorithmic Search Tool in an Educational Setting,” *35th ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 462–466, 2004.
66. C. Erten, P. Harding, S. G. Kobourov, K. Wampler, and G. Yee, “Exploring the Computing Literature Using Temporal Graph Visualization,” *Conference on Visualization and Data Analysis (VDA)*, p. 45–56, 2004.
67. C. Duncan, D. Eppstein, and S. G. Kobourov, “The Geometric Thickness of Low Degree Graphs,” *20th ACM Symposium on Computational Geometry (SCG)*, p. 340–346, 2004.
68. C. Erten, S. G. Kobourov, and C. Pitta, “Morphing Planar Graphs,” *20th ACM Symposium on Computational Geometry (SCG)*, p. 451–452, 2004.
69. S. G. Kobourov and K. Wampler, “Non-Euclidean Spring Embedders,” *10th IEEE Symposium on Information Visualization (INFOVIS)*, p. 207–214, 2004. (Prelim. version of 15.)
70. J. Abello, S. G. Kobourov, and R. Yusufov, “Visualizing Large Graphs with Compound-Fisheye Views and Treemaps,” *12th Symposium on Graph Drawing (GD)*, p. 431–442, 2004.
71. S. G. Kobourov and C. Pitta, “An Interactive Multi-User System for Simultaneous Graph Drawing,” *12th Symposium on Graph Drawing (GD)*, p. 492–503, 2004.
72. C. Erten and S. G. Kobourov, “Simultaneous Embedding of Planar Graphs with Few Bends,” *12th Symposium on Graph Drawing (GD)*, p. 195–206, 2004. (Prelim. version of 16.)
73. D. Forrester, S. G. Kobourov, A. Navabi, K. Wampler, and G. Yee, “graphael: A System for Generalized Force-Directed Layouts,” *12th Symposium on Graph Drawing (GD)*, p. 454–466, 2004.
74. B. Dux, A. Iyer, S. Debray, D. Forrester, and S. G. Kobourov, “Visualizing the Behavior of Dynamically Modifiable Code.” *13th IEEE International Workshop on Program Comprehension (IWPC)*, p. 337–340, 2005.
75. C. Collberg, S. Debray, S. G. Kobourov, and S. Westbrook, “Increasing Undergraduate Involvement in Computer Science Research,” *8th World Conference on Computers in Education (WCCE)*, p. 342–352, 2005.
76. J. Cappos, S. G. Kobourov, M. Miles, M. Stepp, K. Pavlou, and A. Wixted, “Collaboration with DiamondTouch.” *10th International Conference on Human-Computer Interaction (INTERACT)*, p. 986–990, 2005.
77. C. Erten, A. Efrat, D. Forrester, A. Iyer, and S. G. Kobourov, “Force-Directed Approaches to Sensor Localization.” *8th Workshop on Algorithm Engineering and Experiments (ALENEX)*, p. 108–118, 2006.
78. S. G. Kobourov and M. Landis, “Morphing Planar Graphs in Spherical Space,” *14th Symposium on Graph Drawing (GD)*, p. 306–317, 2006. (Prelim. version of 22.)
79. A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, “Characterization of Unlabeled Level Planar Trees,” *14th Symposium on Graph Drawing (GD)*, p. 367–379, 2006. (Prelim. version of 25.)
80. J. Cappos, A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, “Simultaneous Graph Embedding with Bends and Circular Arcs,” *14th Symposium on Graph Drawing (GD)*, p. 95–107, 2006.
81. U. Brandes, C. Erten, J. Fowler, F. Frati, M. Geyer, C. Gutwenger, S. Hong, M. Kaufmann, S. G. Kobourov, G. Liotta, P. Mutzel, “Colored Simultaneous Geometric Embeddings,” *13th International Computing and Combinatorics Conference, (COCOON)*, p. 254–263, 2007. (Prelim. version of 31.)
82. J. Fowler and S. G. Kobourov, “Characterization of Unlabeled Level Planar Graphs,” *15th Symposium on Graph Drawing (GD)*, p. 37–49, 2007.

83. J. Fowler and S. G. Kobourov, "Minimum Level Nonplanar Patterns for Trees," *15th Symposium on Graph Drawing (GD)*, p. 69–75, 2007.
84. F. Frati, M. Kaufmann and S. G. Kobourov, "Constrained Simultaneous and Near-Simultaneous Embeddings," *15th Symposium on Graph Drawing (GD)*, p. 268–279, 2007. (Prelim. version of 24.)
85. J. Fowler, M. Jünger, S. G. Kobourov, and M. Schulz, "On Simultaneous Embedding with Fixed Edges," *Conference on Topological and Geometric Graph Theory*, Electronic Notes in Discrete Mathematics, vol. 31, p. 41-44, 2008.
86. A. Estrella-Balderrama, F. Frati, and S. G. Kobourov, "Upward Straight-line Embeddings of Directed Graphs into Point Sets," *34th Workshop on Graph-Theoretic Concepts in Computer Science (WG)*, p. 122-133, 2008.
87. J. Fowler, M. Jünger, S. G. Kobourov, and M. Schulz, "Characterizing Simultaneous Embedding with Fixed Edges," *34th Workshop on Graph-Theoretic Concepts in Computer Science (WG)*, p. 146-158, 2008.
88. A. Estrella-Balderrama, J. Fowler and S. G. Kobourov, "GraphSET: Graph Simultaneous Embedding Tool," *16th Symposium on Graph Drawing (GD)*, p. 169-180, 2008. (Prelim. version of 27.)
89. A. Estrella-Balderrama, J. Fowler, and S. G. Kobourov, "On the Characterization of Level Planar Trees by Minimal Patterns," *17th Symposium on Graph Drawing (GD)*, p.69-80, 2009.
90. C. Duncan, S. G. Kobourov, and M. Goodrich, "Planar Drawings of Higher-Genus Graphs," *17th Symposium on Graph Drawing (GD)*, p. 45-56, 2009. (Prelim. version of 32.)
91. E. Gansner, Y. Hu, S. G. Kobourov, and C. Volinsky, "Putting Recommendations on the Map – Visualizing Clusters and Relations," *3rd ACM Conference on Recommendation Systems*, p. 345-354, 2009.
92. E. Gansner, Y. Hu, M. Kaufmann, and S. G. Kobourov, "Optimal Polygonal Representation of Planar Graphs," *9th Latin American Theoretical Informatics Symposium (LATIN)*, p. 417-432, 2010.
93. K. Coogan, B. Katz, V. Khare, S. Kobourov, "Multi-Scale Dead-Reckoning Algorithm for Distributed Force-Directed Sensor Network Localization," *6th Workshop on Algorithms for Sensor Systems (ALGOSENSORS)*, p. 148-160, 2010.
94. V. Dujmovic, W. Evans, S. G. Kobourov, G. Liotta, C. Weibel, and S. Wismath, "On Graphs Supported by Line Sets," *18th Symposium on Graph Drawing (GD)*, p. 177-182, 2010.
95. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, and M. Nöllenburg, "Lombardi Drawings of Graphs," *18th Symposium on Graph Drawing (GD)*, p. 195-207, 2010.
96. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, and M. Nöllenburg, "Drawing Trees with Perfect Angular Resolution and Polynomial Area," *18th Symposium on Graph Drawing (GD)*, p. 183-194, 2010.
97. E. Gansner, Y. Hu, and S. G. Kobourov, "On Touching Triangle Graphs," *18th Symposium on Graph Drawing (GD)*, p. 250-261, 2010.
98. Y. Hu, S. G. Kobourov, and S. Veeramoni, "On Maximum Differential Graph Coloring," *18th Symposium on Graph Drawing (GD)*, p. 274-286, 2010.
99. E. Gansner, Y. Hu, and S. G. Kobourov, "GMap: Visualizing Graphs and Clusters as Maps," *3rd IEEE Pacific Visualization Symposium (PacificVis)*, p. 201-208, 2010.
100. S. Isaacman, R. Becker, R. Caceres, S. Kobourov, J. Rowland, A. Varshavsky, "A Tale of Two Cities," *11th ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, p. 19-24, 2010.
101. S. Isaacman, R. Becker, R. Caceres, S. Kobourov, M. Martonosi, J. Rowland, and A. Varshavsky, "Identifying Important Places in People's Lives from Cellular Network Data," *9th Conference on Pervasive Computing*, p. 133-151, 2011.
102. J. Alam, T. Biedl, S. Felsner, M. Kaufmann, and S. G. Kobourov, "Proportional Contact Representations of Planar Graphs," *19th Symposium on Graph Drawing (GD)*, p. 26-38, 2011.
103. P. Angelini, W. Didimo, S. G. Kobourov, T. Mchedlidze, V. Roselli, A. Symvonis, and S. Wismath, "Monotone Drawings of Graphs with Fixed Embedding," *19th Symposium on Graph Drawing (GD)*, p. 379-390, 2011.

104. C. Duncan, D. Eppstein, M. Goodrich, S. G. Kobourov, and M. Löffler, “Planar and Poly-Arc Lombardi Drawings,” *19th Symposium on Graph Drawing (GD)*, p. 308-319, 2011.
105. R. Chernobelskiy, K. Cunningham, M. Goodrich, S. G. Kobourov, and L. Trott, “Force-Directed Lombardi-Style Graph Drawing,” *19th Symposium on Graph Drawing (GD)*, p. 320-331, 2011.
106. Y. Hu, S. G. Kobourov, and D. Mashima, “Visualizing Dynamic Data with Maps,” *4th IEEE Pacific Visualization Symposium (PacificVis)*, p. 102-110, 2011.
107. S. Isaacman, R. Becker, R. Caceres, S. Kobourov, M. Martonosi, J. Rowland, and A. Varshavsky, “Ranges of Human Mobility in Los Angeles and New York,” *8th IEEE International Workshop on Managing Ubiquitous Communications and Services*, p. 88-93, 2011.
108. A. Das, E. Gansner, M. Kaufmann, S. G. Kobourov, J. Spoerhase, and A. Wolff, “Approximating Minimum Manhattan Networks in Higher Dimensions,” *19th European Symposium on Algorithms (ESA)*, p. 49-60, 2011.
109. J. Alam, T. Biedl, S. Felsner, A. Gerasch, M. Kaufmann and S. G. Kobourov, “Linear-Time Algorithms for Proportional Contact Graph Representations,” *22nd Symposium on Algorithms and Computation (ISAAC)*, p. 281-291, 2011. (Best paper award.)
110. Y. Hu, S. G. Kobourov, S. Veeramoni, “Embedding, Clustering and Coloring for Dynamic Maps,” *5th IEEE Pacific Visualization Symposium (PacificVis)*. Accepted, to appear in 2012.

Other Publications

111. C. A. Duncan, M. T. Goodrich, and S. G. Kobourov, “Balanced Aspect Ratio Trees: An Introduction,” 3rd CGC Workshop on Computational Geometry, Providence, 1998.
112. S. G. Kobourov, “Visualization of Large Graphs,” PhD Thesis, Johns Hopkins University, 2000.
113. M. T. Goodrich and S. G. Kobourov, “Multi-Scale Algorithms for Graph Drawing”, 11th Workshop on Computational Geometry, Stony Brook, 2001.
114. C. Erten and S. G. Kobourov, “Simultaneous Embeddings,” 12th Workshop on Computational Geometry, DIMACS, 2002.
115. V. Batagelj, U. Brandes, S. Corman, J. Johnson, S. G. Kobourov, L. Krempel, A. Mrvar, and D. Wagner, “Analysis and Visualization of Network Data,” *22nd Sunbelt Social Networks Conference*, 2002.
116. J. Cappos and S. G. Kobourov, “Trees on Tracks,” 14th Workshop on Computational Geometry, Boston, 2004.
117. U. Brandes, C. Erten, A. Estrella-Balderrama, J. Fowler, F. Frati, M. Geyer, C. Gutwenger, S. Hong, M. Kaufmann, S. G. Kobourov, G. Liotta, P. Mutzel, and A. Symvonis, “Colored Simultaneous Geometric Embeddings and Universal Pointsets,” *The workshop on Algorithms, Combinatorics, and Geometry (ACG 07)*, Denton, TX, 2007.
118. S. P. Borgatti, S. G. Kobourov, O. Kohlbacher, and P. Mutzel, “User-Centered Graph Drawing”, Editors Foreword, Dagstuhl Seminar Proceedings, 2008.
119. A. Estrella-Balderamma, J. Fowler, and S. G. Kobourov, “Colored Simultaneous Geometric Embeddings and Universal Pointsets,” *21th Canadian Conference on Computational Geometry (CCCG)*, p. 17-20, 2009.
120. C. Binucci, E. Di Giacomo, W. Didimo, A. Estrella-Balderamma, F. Frati, S. G. Kobourov, and G. Liotta, “Directed Graphs with an Upward Straight-line Embedding into Every Point Set,” *21th Canadian Conference on Computational Geometry (CCCG)*, p. 21-24, 2009.
121. C. Demetrescu, M. Kaufmann, S. G. Kobourov, P. Mutzel: Graph Drawing with Algorithm Engineering Methods, Editors Foreword, Dagstuhl Seminar Reports, vol. 1, no. 5, p. 47-60, 2011.

Software Tools

1. **GraphSET**: Graph Simultaneous Embedding Tool provides a practical way to study several types of problems in simultaneous embedding, <http://graphset.cs.arizona.edu>

2. **Lombardi**: Lombardi provides a spring embedder with circular arcs that are evenly spread out around each vertex, <http://lombardi.cs.arizona.edu>
3. **SMorph**: Tool for smooth, continuous, and intersection-free morphing of planar graph drawings on the surface of the sphere, <http://smorph.cs.arizona.edu>
4. **GRIP**: Graph Drawing with Intelligent Placement tool provides several efficient algorithms for visualizing large graphs in 2D and 3D Euclidean space, <http://grip.cs.arizona.edu>
5. **TGRIP**: Temporal Graph Drawing with Intelligent Placement tool can visualize large graphs that evolve over time, <http://tgrip.cs.arizona.edu>
6. **GraphAEL**: Graph Animations with Evolving Layouts visualizes large evolving graphs in Euclidean, Spherical, and Hyperbolic spaces, <http://graphael.cs.arizona.edu>
7. **TetraTetris** is a multi-user game and the first non-trivial application developed for the Diamond-Touch table, <http://tetratertris.cs.arizona.edu>
8. **DT** is an interactive, multi-user application designed for the DiamondTouch table for discovering simultaneous planar graph embeddings, <http://dt.cs.arizona.edu>
9. **GMorph** is a system for smooth, continuous, and intersection-free morphing of planar graph drawings in 2D Euclidean space, <http://gmorph.cs.arizona.edu>
10. **SimG** is a system for simultaneously visualizing multiple graphs defined on a common set of vertices, <http://simg.cs.arizona.edu>
11. **SPLaT** is a web-spider and text analyzer for self-plagiarism detection, <http://splat.cs.arizona.edu>

Grants

1. PI, *Putting Network Security on the Map*, Office of Naval Research, \$4,157,490, 2011-16
2. PI, *ImageQuest: Calibrated Imaging and Validated Analysis*, NSF-IBIV, \$1,268,593, 2010-13
3. PI, *CAREER: Embedding, Morphing, & Visualizing Dynamic Graphs*, NSF-CCF, \$419,645, 2006-11
4. PI, *Algorithms for Visualizing Data with Contact Graphs*, NSF-CCF, \$296,001, 2011-14
5. PI, *Visualization of Giga-Graphs and Graph Processes*, NSF-ACR, \$240,358, 2002-05
6. PI, *Proportional Graph Visualization*, Alexander von Humboldt Foundation, \$98,800, 2011-2013
7. PI, *Visualization of Giga-Graphs and Graph Processes*, NSF-REU Suppl., \$42,500, 2002-05
8. co-PI, *Collaborative Mind-Mapping Solution to the Obesity Challenge*, USDA, \$500,000, 2010-2012
9. co-PI, *Bootstrapping Broad-Coverage Network Services*, NSF-CNS, \$94,000, 2004-05

Steering Committees and Editorial Boards

Steering Committee, Graph Drawing, 2001–2004
 Editorial Board, Journal of Graph Algorithms and Applications
 Editorial Board, Graph Drawing E-print Archive

Program Committee Service

PC chair, 5th IEEE Pacific Visualization Symposium, Songdo, Korea, 2012
 PC chair, 10th International Symposium on Graph Drawing, Irvine, CA, 2002
 PC member, 16th European Symposium on Algorithms (ESA): 2008
 PC member, 17th ACM-SIAM Symposium on Discrete Algorithms (SODA): 2006
 PC member, 3rd ACM Symposium on Software Visualization (SOFTVIS): 2010, 2006
 PC member, International Symposium on Graph Drawing: 2012, 2010, 2008, 2006
 PC member, 3rd International Conference on Human Computer Interaction, Innsbruck, Austria, 2008
 Co-chair, Dagstuhl Workshop on Map-based Visualization, Dagstuhl, Germany, 2012
 Co-chair, Dagstuhl Workshop on Graph Drawing & Algorithm Engineering, Dagstuhl, Germany, 2011
 Co-chair, Dagstuhl Workshop on User-Centered Graph Drawing, Dagstuhl, Germany, 2008
 Co-chair, Dagstuhl Workshop on Graph Drawing, Dagstuhl, Germany, 2005
 Chair, 13th Annual Graph Drawing Contest, Karlsruhe, Germany, 2006
 Chair, 12th Annual Graph Drawing Contest, Limerick, Ireland, 2005
 Chair, 11th Annual Graph Drawing Contest, New York, NY, 2004

Conference Committee Service

Organizing Committee, 22nd ACM Symposium on Computational Geometry, Sedona, AZ, 2006
Organizing Committee, 13th International Symposium on Graph Drawing, Limerick, Ireland, 2005
Organizing Committee, 12th International Symposium on Graph Drawing, New York, NY, 2004

Journal Reviews

SIAM Journal of Computing, ACM Transactions on Algorithms, ACM Transactions on Graphics, IEEE Transactions of Visualization and Computer Graphics, Journal of Algorithms, Journal of Discrete and Computational Geometry, International Journal of Computational Geometry and Applications, Journal of Graph Algorithms and Applications, Journal of Computational Geometry: Theory and Applications, Journal of Theoretical Computer Science, Journal of Combinatorics, Journal Algorithmica, International Journal of Foundations of Computer Science, Software Practice and Experience, Journal of Networks, Journal of Discrete Applied Mathematics, Rocky Mountain Journal of Mathematics, Journal of Naval Research Logistics, Journal of Social Structure

Conference Reviews

Symposium on Graph Drawing (GD), ACM Symposium on Computational Geometry (SCG), ACM-SIAM Symposium on Discrete Algorithms (SODA), ACM Symposium on Theory of Computing (STOC), IEEE Symposium on Foundations of Computer Science (FOCS), European Symposium on Algorithms (ESA), Workshop on Algorithm Engineering and Experiments (ALENEX), ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), IEEE Conference on Information Visualization (INFOVIS), IEEE Pacific Visualization Symposium (PacificVis), Scandinavian Workshop on Algorithm Theory (SWAT), Workshop on Algorithms and Data Structures (WADS), Symposium on Experimental Algorithms (SEA)

Postdoctoral Advisees

Joe Fowler (PhD, University of Arizona), April 2011–
Aparna Das (PhD, Brown University), September 2010–
Michael Schulz (PhD, Universität zu Köln), 2008
Katharina Zweig (PhD, Universität Tübingen), 2007
Carsten Görg (PhD, Universität Trier), 2006

PhD Advisees

Cesim Erten, “Simultaneous Embedding and Visualization of Graphs,” April 2005
Alejandro Estrella-Balderramma, “Simultaneous Embedding and Level Planarity,” April 2009
Joe Fowler, “Unlabeled Level Planarity,” April 2009
Sankar Veeramoni, 3rd year PhD student
Jawaherul Alam, 2st year PhD student

MS Advisees

Michael Stepp (MS), currently pursuing PhD at University of California - San Diego
Kevin Wampler (MS), currently pursuing PhD at University of Washington
Martin Stepp (MS), currently at Microsoft
Roman Yusufov (MS), currently at IBM
Chandan Pitta (MS), currently at Motorola
James Judd (MS), currently at IBM
Bennett Kankuzi (MS), University in Botswana
Kamogelo Isaac (MS), University in Botswana
Matt Landis (MS)

BS Advisees

(14 papers in refereed conference proceedings with undergraduate student co-authors)

Jessica Miller (BS), currently pursuing PhD at University of Washington
Ed Carter (BS), currently pursuing PhD at University of California-Berkeley
Kelly Heffner (BS), currently pursuing PhD at Harvard

Phil Harding (BS), currently pursuing PhD at University of California - Irvine
Gary Yee (BS), currently pursuing PhD at University of Colorado
Armand Navabi (BS), currently pursuing PhD at Purdue University
Kyriacos Pavlou (BS), currently pursuing PhD at the University of Arizona
Amanda Wixted (BS), currently a game programmer at Octopi
Jacob Pitts (BS), currently at Microsoft
David Forester (BS), currently at Microsoft
Anand Iyer (BS), currently at Microsoft
Steve Kobes (BS), currently at Google
Katie Cunningham (BS)
Roman Chernobelskyi (BS)

Collaborators

James Abello (DIMACS), Jawaherul Alam (U Arizona), Patrizio Angelini (U Rome), Baruch Awerbuch (Johns Hopkins U), Richard Becker (AT&T Research), Terese Biedl (U Waterloo), Carla Binucci (U Perugia), Franz Brandenburg (U Passau), Ulrik Brandes (U Konstanz), Peter Brass (CUNY), Stina Bridgeman (Colgate U), Ramon Caceres (AT&T Research), Christine C. Cheng (U Wisconsin–Milwaukee), Roman Chernobelskyi (U Arizona), Christian Collberg (U Arizona), Kevin Coogan (U Arizona), Katherine Cunningham (U Arizona), Aparna Das (U Arizona), Saumya Debray (U Arizona), Erik Demaine (MIT), Emilio Di Giacomo (U Perugia), Walter Didimo (U Perugia), Vida Dujmovic (Carleton), Christian A. Duncan (U Miami), Alon Efrat (U Arizona), Cesim Erten (Kadiras U), David Eppstein (UC–Irvine), Alejandro Estrella-Balderamma (Google), Will Evans (UBC), Stefan Felsner (TU–Berlin), Fabrizio Frati (U Rome), Rudolf Fleischer (Hong Kong U), Pavel Gajer (Johns Hopkins U), Marcus Geyer (U Tübingen), Emden Gansner (AT&T Research), Hector H. González-Baños (Honda Research), Michael T. Goodrich (UC–Irvine), Carsten Gutwenger (U Dortmund), Seokhee Hong (U Sydney), Yifan Hu (AT&T Research), Sibren Isaacman (Princeton), Daniel Ismailescu (Hofstra), Michael Jünger (U Cologne), Bastian Katz (U Karlsruhe), Michael Kaufmann (U Tübingen), Varun Khare (U Arizona), Karsten Klein (U Dortmund), V. S. A. Kumar (Los Alamos National Labs), Giuseppe Liotta (U Perugia), Maarten Löffler (UC–Irvine), Anna Lubiw (U Waterloo), Margaret Martonosi (Princeton), Daisuke Mashima (GA Tech), Tamara Mchedlidze (U Athens), Joseph S. B. Mitchell (Stony Brook), Petra Mutzel (U Dortmund), Jasvir Nagra (Google), Martin Nöllenburg (Karlsruhe), Tamara Mchedlidze (U Athens), Chandan Pitta (Google), Vincenzo Roselli (U Rome), James Rowland (AT&T Research), Michael Schulz (U Cologne), Joachim Spoerhase (U Würzburg), Antonios Symvonis (U Athens), Roberto Tamassia (Brown U), Clark Thomborson (U. Auckland), Lowell Trott (UC–Irvine), Alexander Varshavsky (AT&T Research), Sankar Veeramoni (U Arizona), Chris Volinsky (AT&T Research), Dorothea Wagner (U Karlsruhe), Kevin Wampler (U Washington), Carola Wenk (U Texas–San Antonio), Suzanne Westbrook (U Arizona), Christophe Weibel (McGill), Stephen Wismath (Lethbridge), Alexander Wolff (U Würzburg)

Courses Taught and Developed

Algorithmic Information Visualization (developed and taught at Arizona)
Analysis of Discrete Structures (developed and taught at Arizona)
Automata Grammars and Languages (revised and taught at Arizona)
Concepts in Computing (revised and taught at Dartmouth)
Data Structures and Object Oriented Programming (revised and taught at Dartmouth)
Data Structures in C++ (revised and taught at Hopkins)
Design and Analysis of Algorithms (revised and taught at Arizona)
Graph Theoretic Concepts in Computer Science (developed and taught at Arizona)
Human Computer Interaction (developed and taught at Arizona)
Introduction to Algorithms (revised and taught at Arizona)
Algorithms and Data Structures (developed and taught at Botswana)
Operating Systems (revised and taught at Dartmouth)
Research Methods in Computer Science (developed and taught at Botswana)
Theory of Computation (revised and taught at Arizona)

References

Prof. Michael T. Goodrich, Department of Computer Science, University of California, Irvine, CA 92697, goodrich@uci.edu

Prof. Cliff Stein, Department of IEOR, Columbia University, 500 W. 120 St., MC 4704, New York, NY 10027, cliff@ieor.columbia.edu

Prof. Scot Drysdale, Department of Computer Science, Dartmouth College, 6211 Sudikoff Lab, Hanover, NH 03755-3510, scot@cs.dartmouth.edu

Prof. Peter Downey, Chair, Department of Computer Science, University of Arizona, 1040 E 4th St, Tucson, AZ 85721, pete@cs.arizona.edu

Prof. Michael Kaufmann, Institut für Informatik, Universität Tübingen, Sand 13, D-72076, Tübingen, Germany, mk@informatik.uni-tuebingen.de

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