

Curriculum Vitae

Stephen Kobourov

Department of Computer Science
University of Arizona, Tucson AZ 85721
Web: <http://www.cs.arizona.edu/~kobourov>
Email: kobourov@cs.arizona.edu
Phone: 520-626-5320

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 and Mathematics (double major); Classics (minor)
Summa Cum Laude, Dartmouth College

Professional Experience

- 2017 – present Research Director of Data7 (Data Science Institute), University of Arizona
- 2012 – present Professor, Computer Science, University of Arizona
- 2006 – 2012 Associate Professor, Computer Science, University of Arizona
- 2000 – 2006 Assistant Professor, Computer Science, University of Arizona
- 2015 – 2016 Fulbright Distinguished Chair, Charles University, Prague, Czech Republic
- 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

Information Visualization, Graph Drawing and Network Visualization
Geometric Algorithms, Algorithm Engineering, Graph Theory

Honors, Awards, and Memberships

- Best Paper Award, 25th International Symposium on Graph Drawing and Network Visualization, 2017
- Fulbright Distinguished Chair, US Department of State, 2015-2016
- Humboldt Research Fellow, Alexander von Humboldt Foundation, Germany 2011-2014
- Outstanding Faculty Research Award, Dept. of Computer Science, University of Arizona, 2015
- Outstanding Faculty Teaching Award, Dept. of Computer Science, University of Arizona, 2014
- Outstanding Faculty Research Award, Dept. of Computer Science, University of Arizona, 2014
- 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
- 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

Refereed Journal Publications

1. S. Nusrat, J. Alam, C. Scheidegger, S. Kobourov, “Cartogram Visualization for Bivariate Geo-Statistical Data,” *IEEE Transactions on Visualization and Computer Graphics*, DOI: 10.1109/TVCG.2017.2765330, Accepted, to appear in 2018.
2. S. Nusrat, J. Alam, S. Kobourov, “Evaluating Cartogram Effectiveness,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 24, no. 2, p. 1077-1090, 2018.

3. A. Das, K. Fleszar, S. Kobourov, J. Spoerhase, S. Veeramoni, A. Wolff, "Approximating the Generalized Minimum Manhattan Network Problem," *Algorithmica*. DOI: 10.1007/s00453-017-0298-0, Accepted, to appear in 2018.
4. M. Chimani, S. Felsner, S. Kobourov, T. Ueckerdt, P. Valtr, A. Wolff, "On the Maximum Crossing Number," *Journal of Graph Algorithms and Applications*, vol. 22, no. 1, p. 67-87, 2018.
5. W. Evans, S. Felsner, M. Kaufmann, S. Kobourov, D. Mondal, R. Nishat, K. Verbeek, "Table Cartogram," *Computational Geometry: Theory and Applications*, vol. 68, p. 174-185, 2018.
6. J. Alam, S. Kobourov, D. Mondal, "Orthogonal Layout with Optimal Face Complexity," *Computational Geometry: Theory and Applications*, vol. 63, p. 40-52, 2017.
7. E. Welch and S. Kobourov, "Measuring Symmetry in Drawings of Graphs," *Computer Graphics Forum*, special issue on EuroVis'17, vol. 36, no. 3, 2017.
8. H. Kruiger, P. Rauber, R. Martins, A. Kerren, S. Kobourov, A. Telea, "Graph Layouts by t-SNE," *Computer Graphics Forum*, special issue on EuroVis'17, vol. 36, no. 3, 2017.
9. M. Bekos, S. Kobourov, M. Kaufmann, S. Veeramoni, "The Maximum k-Differential Coloring Problem," *Journal of Discrete Algorithms*, vol. 45, p. 35-53, 2017.
10. P. Angelini, M. Bekos, F. De Luca, W. Didimo, M. Kaufmann, S. Kobourov, F. Montecchiani, C. Raftopoulou, V. Roselli, A. Symvonis, "Vertex-Coloring with Defects," *Journal of Graph Algorithms and Applications*, vol. 21, no. 3, p. 313-340, 2017.
11. J. Alam, S. Chaplick, G. Fijavz, M. Kaufmann, S. Kobourov, S. Pupyrev, J. Toeniskoetter, "Threshold-Coloring and Unit-Cube Contact Representation of Planar Graphs," *Discrete Applied Mathematics*, vol. 216, no. 1, p. 2-14, 2017.
12. M. Bekos, T. van Dijk, M. Fink, P. Kindermann, S. Kobourov, S. Pupyrev, J. Spoerhase, A. Wolff, "Improved Approximation Algorithms for Box Contact Representations," *Algorithmica*, vol. 77, no. 3, p. 902-920, 2017
13. B. Saket, C. Scheidegger, S. Kobourov, "Comparing Node-Link and Node-Link-Group Visualizations From An Enjoyment Perspective," *Computer Graphics Forum*, special issue on EuroVis'16, vol. 35, no. 3, p. 41-50, 2016.
14. S. Nusrat and S. Kobourov, "The State of the Art in Cartograms," *Computer Graphics Forum*, special issue on EuroVis'16, vol. 35, no. 3, p. 619-640, 2016.
15. S. Emmons, S. Kobourov, M. Gallant, K. Börner, "Analysis of Network Clustering Algorithms and Cluster Quality Metrics at Scale," *PLOS ONE*, vol. 11, no. 7, 2016.
16. J. Alam, M. Kaufmann, S. Kobourov, T. Mchedlidze, "Fitting Planar Graphs on Planar Maps." *Journal of Graph Algorithms and Applications*, vol. 19, no. 1, p. 413-440, 2015.
17. A. Efrat, Y. Hu, S. Kobourov, S. Pupyrev, "MapSets: Visualizing Embedded and Clustered Graphs," *Journal of Graph Algorithms and Applications*, vol. 19, no. 2, p. 571-593. 2015. (Invited to this special issue on the best papers from GD'2014.)
18. B. Saket, C. Scheidegger, S. Kobourov, Katy Börner, "Map-based Visualizations Increase Long-Term Recall of Data," *Computer Graphics Forum*, special issue on EuroVis'15, vol. 34, no. 3, p. 441-450, 2015.
19. J. Alam, S. Kobourov, S. Veeramoni, "Quantitative Measures for Cartogram Generation Techniques," *Computer Graphics Forum*, special issue on EuroVis'15, vol. 34, no. 3, p. 351-360, 2015.
20. P. Angelini, W. Didimo, S. Kobourov, T. Mchedlidze, V. Roselli, A. Symvonis, S. Wismath, "Monotone Drawings of Graphs with Fixed Embedding," *Algorithmica*, vol. 71, no. 2, p. 233-257, 2015.
21. A. Das, E. Gansner, M. Kaufmann, S. Kobourov, J. Spoerhase, A. Wolff, "Approximating Minimum Manhattan Networks in Higher Dimensions," *Algorithmica*, vol. 71, no. 1, p. 36-52, 2015.
22. B. Saket, P. Simonetto, S. Kobourov, Katy Börner, "Evaluation of Node, Node-Link, and Node-Link-Group Diagrams," *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, vol. 20, no. 12, p. 2231-2240, 2014.
23. M. Bekos, M. Kaufmann, S. Kobourov, S. Veeramoni, "A Note on Maximum Differential Coloring of Planar Graphs," *Journal of Discrete Algorithms*, vol. 29, p. 1-7, 2014.

24. Y. Hu, S. Kobourov, S. Veeramoni, "Embedding, Clustering and Coloring for Dynamic Maps," *Journal of Graph Algorithms and Applications*, vol. 18, no. 1, p. 77-109, 2014.
25. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, M. Nöllenburg, "Drawing Trees with Perfect Angular Resolution and Polynomial Area," *Discrete & Computational Geometry*, Vol. 49, no. 2, p. 157-182, 2013.
26. M. Hingle, D. Yoon, J. Fowler, S. Kobourov, M. Schneider, D. Falk, R. Burd, "Collection and visualization of dietary behavior and reasons for eating using a popular and free social media software application," *Journal of Medical Internet Research (JMIR)*, Vol. 15, no. 6, p.125-145, 2013.
27. J. Alam, T. Biedl, S. Felsner, A. Gerasch, M. Kaufmann, S. Kobourov, "Linear-Time Algorithms for Proportional Contact Graph Representations." *Algorithmica*, Vol. 67, p. 3-22, 2013. (Invited to this special issue as the best paper award winner from ISAAC'2011.)
28. M. Bekos, M. Kaufmann, S. Kobourov, A. Symvonis, "Smooth Orthogonal Layouts," *Journal of Graph Algorithms and Applications*, vol. 17, no. 5, p. 575-595, 2013.
29. J. Alam, T. Biedl, S. Felsner, M. Kaufmann, S. Kobourov, T. Ueckerdt, "Computing Cartograms with Optimal Complexity," *Discrete & Computational Geometry*, vol. 50, no. 3, p. 784-810, 2013.
30. E. Gansner, Y. Hu, M. Kaufmann, S. Kobourov, "Optimal Polygonal Representation of Planar Graphs," *Algorithmica*, vol. 63, no. 3, p. 672-691, 2012. (Invited to this special issue on the best papers from LATIN'2010.)
31. J. Alam, T. Biedl, S. Felsner, M. Kaufmann, S. Kobourov, "Proportional Contact Representations of Planar Graphs," *Journal of Graph Algorithms and Applications*, vol. 16, no. 3, p. 701-728, 2012. (Invited to this special issue on the best papers from GD'2011.)
32. Y. Hu, S. Kobourov, D. Mashima, "Visualizing Dynamic Data with Maps," *IEEE Transactions on Visualization and Computer Graphics*, vol. 18, no. 9, p. 1424-1437, 2012. (Invited to this special issue on the best papers from PacificVis'2011.)
33. J. Fowler, M. Juenger, S. Kobourov, 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.
34. U. Brandes, C. Erten, A. Estrella-Balderrama, J. Fowler, F. Frati, M. Geyer, C. Gutwenger, S. Hong, M. Kaufmann, S. Kobourov, G. Liotta, P. Mutzel, 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.)
35. C. Duncan, S. Kobourov, 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.)
36. C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, 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.)
37. C. Binucci, E. Di Giacomo, W. Didimo, A. Estrella-Balderrama, F. Frati, S. 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.
38. A. Estrella-Balderrama, J. Fowler, S. Kobourov, "GraphSET, a tool for simultaneous graph drawing," *Software: Practice and Experience*, vol. 10, no. 40, p. 849-863, 2010.
39. C. Erten, A. Efrat, D. Forrester, A. Iyer, S. Kobourov, "Force-Directed Approaches to Sensor Localization," *IEEE Transaction on Sensor Networks*, vol. 7, no. 3, p. 1-25, 2010.
40. E. Gansner, Y. Hu, S. 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.)
41. F. Frati, M. Kaufmann, S. 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.)
42. A. Estrella-Balderrama, J. Fowler, S. Kobourov, "Characterization of Unlabeled Level Planar Trees", *Computational Geometry: Theory and Applications*, vol. 42, no. 6, p. 704-721, 2009.

43. S. 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.)
44. J. Cappsos, A. Estrella-Balderrama, J. Fowler, S. Kobourov, “Simultaneous Graph Embedding with Bends and Circular Arcs,” *Computational Geometry: Theory and Applications*, vol. 42, no. 2, p. 173-182, 2008.
45. P. Brass, E. Cenek, C. Duncan, A. Efrat, C. Erten, D. Ismailescu, S. Kobourov, A. Lubiw, J. S. B. Mitchell, “On Simultaneous Planar Graph Embeddings,” *Computational Geometry: Theory and Applications*, vol. 36, no. 2, p. 117-130, 2007.
46. A. Efrat, C. Erten, S. Kobourov, “Fixed-Location Circular-Arc Drawing of Planar Graphs,” *Journal of Graph Algorithms and Applications*, vol. 11, no. 1, p. 145-164, 2007.
47. C. Duncan, S. Kobourov, V. S. A. Kumar, “Optimal Constrained Graph Exploration,” *ACM Transactions on Algorithms*, vol. 2, no. 3, p. 380-402, 2007.
48. C. Erten and S. 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.)
49. C. Duncan, A. Efrat, S. Kobourov, 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.)
50. A. Efrat, S. Kobourov, A. Lubiw, “Computing Homotopic Shortest Paths Efficiently,” *Computational Geometry: Theory and Applications*, vol. 35, no. 3, p. 162-172, 2006.
51. C. Erten and S. 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).
52. C. Erten, S. Kobourov, V. Le, 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.)
53. S. Kobourov and K. Wampler, “Non-Euclidean Spring Embedders,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 11, no. 6, p. 757–767, 2005.
54. C. Collberg and S. Kobourov, “Self-Plagiarism in Computer Science,” *Communications of the ACM*, vol. 48, no. 4, p. 88–94, 2005.
55. P. Gajer, M. Goodrich, S. 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.)
56. T. Biedl, E. Demaine, C. Duncan, R. Fleischer, S. Kobourov, “Tight Bounds on Maximal and Maximum Matching,” *Journal of Discrete Mathematics*, vol. 285, no. 1, p. 7–15, 2004.
57. C. Duncan and S. 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.)
58. C. Duncan, M. Goodrich, S. 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.)
59. P. Gajer and S. 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.)
60. C. Cheng, C. Duncan, M. Goodrich, S. Kobourov, “Drawing Planar Graphs with Circular Arcs,” *Discrete & Computational Geometry*, vol. 25, p. 405–418, 2001.
61. C. Duncan, M. Goodrich, S. 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.)
62. C. Duncan, M. Goodrich, S. 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.)

Refereed Conference Publications

63. M. Okoe, R. Jianu, S. Kobourov, “Revisited Network Representations,” *25th Symposium on Graph Drawing (GD)*, 2017. (Best paper award)
64. P. Simonetto, D. Archambault, S. Kobourov, “Drawing Dynamic Graphs Without Timeslices,” *25th Symposium on Graph Drawing (GD)*, 2017.
65. P. Kindermann, S. Kobourov, M. Loeffler, M. Noellenburg, A. Schulz, B. Vogtenhuber, “Lombardi Drawings of Knots and Links,” *25th Symposium on Graph Drawing (GD)*, 2017.
66. P. Angelini, S. Chaplick, F. De Luca, J. Fiala, J. Hancl, N. Heinsohn, M. Kaufmann, S. Kobourov, J. Kratochvil, P. Valtr, “On Vertex- and Empty-Ply Proximity Drawings,” *25th Symposium on Graph Drawing (GD)*, 2017.
67. R. Ahmed, S. Kobourov, S. Rahman, “Online Facility Assignment,” *13th International Conference and Workshops on Algorithms and Computation (WALCOM)*. Accepted, to appear in 2018.
68. E. Welch and S. Kobourov, “Measuring Symmetry in Drawings of Graphs,” *19th IEEE Eurographics Conference on Visualization (EuroVis)*, 2017. (Prelim. version of 7.)
69. H. Kruiger, P. Rauber, R. Martins, A. Kerren, S. Kobourov, A. Telea, “Graph Layouts by t-SNE,” *19th IEEE Eurographics Conference on Visualization (EuroVis)*, 2017. (Prelim. version of 8.)
70. M. Chimani, S. Felsner, S. Kobourov, T. Ueckerdt, P. Valtr, A. Wolff, “On the Maximum Crossing Number,” *28th International Workshop on Combinatorial Algorithms (IWOCA)*, 2017. (Prelim. version of 4.)
71. F. De Luca, E. Di Giacomo, W. Didimo, S. Kobourov, G. Liotta, “An Experimental Study on the Ply Number of Straight-line Drawings,” *11th International Conference and Workshops on Algorithms and Computation (WALCOM)*, p. 135-148, 2016.
72. P. Angelini, M. Bekos, T. Bruckdorfer, J. Hancl, M. Kaufmann, S. Kobourov, A. Symvonis, P. Valtr, “Low Ply Drawings of Trees,” *24th International Symposium on Graph Drawing and Network Visualization (GD)*, p. 236-248, 2016.
73. B. Saket, C. Scheidegger, S. Kobourov, “Comparing Node-Link and Node-Link-Group Visualizations From An Enjoyment Perspective,” *18th IEEE Eurographics Conference on Visualization (EuroVis)*, 2016. (Prelim. version of 13.)
74. S. Nusrat and S. Kobourov, “The State of the Art in Cartograms,” *18th IEEE Eurographics Conference on Visualization (EuroVis)*, 2016. (Prelim. version of 14.)
75. D. Bell, D. Fried, L. Huangfu, M. Surdeanu, S. Kobourov, “Towards Using Social Media to Identify Individuals at Risk for Preventable Chronic Illness,” *10th International Conference on Language Resources and Evaluation (LREC)*, 2016.
76. D. Eppstein, P. Kindermann, S. Kobourov, G. Liotta, A. Lubiw, A. Maignan, D. Mondal, H. Vosoughpour, S. Whitesides, S. Wismath, “On the Planar Split Thickness of Graphs,” *12th Latin American Theoretical Informatics Symposium (LATIN)*, p. 403-415, 2016.
77. J. Alam, S. Kobourov, D. Mondal, “Orthogonal Layout with Optimal Face Complexity,” *42nd International Conference on Current Trends in Theory and Practice of Computer Science (SofSem)*, p. 121-133, 2016. (Prelim. version of 6.)
78. J. Alam, M. Kaufmann, S. Kobourov, “On Contact Graphs with Cubes and Proportional Boxes,” *42nd International Conference on Current Trends in Theory and Practice of Computer Science (SofSem)*, p. 107-120, 2016.
79. J. Alam, S. Kobourov, S. Pupyrev, J. Toeniskoetter, “Weak Unit Disk and Interval Representation of Graphs,” *41st International Workshop on Graph-Theoretic Concepts in Computer Science (WG)*, p. 237-251, 2016.
80. B. Saket, C. Scheidegger, S. Kobourov, Katy Börner, “Map-based Visualizations Increase Long-Term Recall of Data,” *17th IEEE Eurographics Conference on Visualization (EuroVis)*, 2015. (Prelim. version of 18.)
81. J. Alam, S. Kobourov, S. Veeramoni, “Quantitative Measures for Cartogram Generation Techniques,” *17th IEEE Eurographics Conference on Visualization (EuroVis)*, 2015. (Prelim. version of 19.)
82. T. Johnson, C. Acedo, S. Kobourov, S. Nusrat, “Analyzing the Evolution of the Internet,” *17th IEEE Eurographics Conference on Visualization (EuroVis – short papers)*, 2015.

83. S. Kobourov and S. Nusrat, "Task Taxonomy for Cartograms," *17th IEEE Eurographics Conference on Visualization (EuroVis – short papers)*, 2015.
84. B. Saket, S. Kobourov, C. Scheidegger, "Towards Understanding Enjoyment and Flow in Information Visualization," *17th IEEE Eurographics Conference on Visualization (EuroVis – short papers)*, 2015.
85. J. Alam, W. Evans, D. Eppstein, S. Kobourov, S. Pupyrev, J. Toeniskoetter, T. Ueckerdt, "Contact Representations of Non-Planar Graphs," *Algorithms and Data Structures Symposium (WADS)*, p. 14-27, 2015.
86. J. Alam, D. Eppstein, M. Kaufmann, S. Kobourov, S. Pupyrev, A. Schulz, T. Ueckerdt, "Contact Graphs of Circular Arcs," *Algorithms and Data Structures Symposium (WADS)*, p. 1-13, 2015.
87. E. Di Giacomo, W. Didimo, S. Hong, M. Kaufmann, S. Kobourov, G. Liotta, K. Misue, A. Symvonis, H. Yen, "Low Ply Graph Drawing," *6th IEEE International Conference on Information, Intelligence, Systems and Applications (IISA)*, p. 1-6, 2015.
88. T. Bruckdorfer, M. Kaufmann, S. Kobourov, S. Pupyrev, "On Embeddability of Buses in Point Sets," *23rd Symposium on Graph Drawing (GD)*, p. 395-408, 2015.
89. M. Bekos, S. Kobourov, M. Kaufmann, S. Veeramoni, "The Maximum k-Differential Coloring Problem," *41st Conference on Current Trends in Theory and Practice of Computer Science (SofSem)*, p. 115-127, 2015. (Prelim. version of 9.)
90. B. Saket, P. Simonetto, S. Kobourov, Katy Börner, "Evaluation of Node, Node-Link, and Node-Link-Group Diagrams," *20th IEEE Symposium on Information Visualization (INFOVIS)*, p. 2231-2240, 2014. (Prelim. version of 22.)
91. J. Fowler, T. Johnson, P. Simonetto, M. Schneider, C. Acedo, S. Kobourov, L. Lazos, "IMap: Visualizing Network Activity over Internet Maps," *11th Visualization for Cyber Security Conference (VizSec)*, p. 80-87, 2014.
92. D. Fried, M. Surdeanu, S. Kobourov, M. Hingle, "Analyzing the Language of Food on Social Media," *IEEE International Conference on Big Data (BigData)*, p. 778-783, 2014.
93. M. Bekos, T. van Dijk, M. Fink, P. Kindermann, S. Kobourov, S. Pupyrev, J. Spoerhase, A. Wolff, "Improved Approximation Algorithms for Box Contact Representations," *22nd European Symposium on Algorithms (ESA)*, p. 87-99, 2014. (Prelim. version of 12.)
94. S. Pupyrev, P. Simonetto, S. Kobourov, "Visualizing Graphs as Maps with Contiguous Regions," *16th IEEE Eurographics Conference on Visualization (EuroVis – short papers)*, p. 31-35, 2014.
95. S. Kobourov, B. Saket, P. Simonetto, "Group-Level Graph Visualization Taxonomy," *16th IEEE Eurographics Conference on Visualization (EuroVis – short papers)*, p. 85-89, 2014.
96. S. Kobourov, S. Pupyrev, B. Saket, "Are Crossings Important for Drawing Large Graphs," *22nd Symposium on Graph Drawing (GD)*, p. 234-245, 2014.
97. J. Alam, D. Eppstein, M. Goodrich, S. Kobourov, S. Pupyrev, "Balanced Circle Packings for Planar Graphs," *22nd Symposium on Graph Drawing (GD)*, p. 125-136, 2014.
98. A. Efrat, Y. Hu, S. Kobourov, S. Pupyrev, "MapSets: Visualizing Embedded and Clustered Graphs," *22nd Symposium on Graph Drawing (GD)*, p. 452-463, 2014. (Prelim. version of 17.)
99. J. Alam, S. Kobourov, G. Liotta, S. Pupyrev, S. Veeramoni, "Proportional Contact Representations Using Ls," *5th IEEE International Conference on Information, Intelligence, Systems and Applications (IISA)*, p. 27-32, 2014.
100. J. Alam, M. Kaufmann, S. Kobourov, T. Mchedlidze, "Fitting Planar Graphs on Planar Maps," *40th Conference on Current Trends in Theory and Practice of Computer Science (SofSem)*, p. 52-64, 2014. (Prelim. version of 16.)
101. L. Barth, S. Fabrikant, S. Kobourov, A. Lubiw, M. Nöllenburg, Y. Okamoto, S. Pupyrev, C. Squarcella, T. Ueckerdt, A. Wolff, "Semantic word cloud representations: Hardness and approximation algorithms," *11th Latin American Theoretical Informatics Symposium (LATIN)*, p. 514-525, 2014.
102. J. Alam, M. Bekos, M. Kaufmann, S. Kobourov, P. Kindermann, A. Wolff, "Smooth Orthogonal Drawings of Planar Graphs," *11th Latin American Theoretical Informatics Symposium (LATIN)*, p. 144-155, 2014.
103. J. Alam, S. Kobourov, S. Pupyrev, J. Toeniskoetter, "Happy Edges: Threshold-Coloring of Regular Lattices," *FUN with Algorithms (FUN)*, p. 28-39, 2014.

104. D. Fried and S. Kobourov, "Maps of Computer Science," *7th IEEE Pacific Visualization Symposium (PacificVis)*, p. 113-120, 2014.
105. L. Cruz, S. Kobourov, S. Pupyrev, P. Shen, S. Veeramoni, "Computing Consensus Curves," *13th Symposium on Experimental Algorithms (SEA)*, p. 223-234, 2014.
106. L. Barth, S. Kobourov, S. Pupyrev, "Experimental Comparison of Semantic Word Clouds," *13th Symposium on Experimental Algorithms (SEA)*, p. 247-258, 2014.
107. S. Kobourov, T. Ueckerdt, K. Verbeek, "Combinatorial and Geometric Properties of Planar Laman Graphs." *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, p. 1668-1779, 2013.
108. J. Kämper, S. Kobourov, M. Nöllenburg, "Circular-arc cartograms." *6th IEEE Pacific Visualization Symposium (PacificVis)*, p. 1-9, 2013.
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Software Tools

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2. MoCS: Maps of Computer Science: MoCS provides a method to visualize concept maps of topics from the DBLP database of computer science research papers, <http://mocs.cs.arizona.edu>
3. WordCloud: A semantics-aware word-cloud visualization tool, using NLP tools to compute similarities and place related words close to each other, <http://wordcloud.cs.arizona.edu>
4. AngryAnts: We compute accurate ant trajectories from many (inaccurate) trajectories submitted by citizen scientists who play the AngryAnts game, <http://cgi.cs.arizona.edu/projects/angryants/>
5. GMap: A Graph-based Map visualization tool, uses the geographic map metaphor to visualize relational or metric data, implemented and available in the graphviz package, <http://www.graphviz.org>
6. GraphSET: Graph Simultaneous Embedding Tool provides a practical way to study several types of problems in simultaneous embedding, <http://graphset.cs.arizona.edu>
7. Lombardi: Lombardi provides a spring embedder with circular arcs that are evenly spread out around each vertex, <http://lombardi.cs.arizona.edu>
8. SMorph: Tool for smooth, continuous, and intersection-free morphing of planar graph drawings on the surface of the sphere, <http://smorph.cs.arizona.edu>

9. 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>
10. TGRIP: Temporal Graph Drawing with Intelligent Placement tool can visualize large graphs that evolve over time, <http://tgrip.cs.arizona.edu>
11. GraphAEL: Graph Animations with Evolving Layouts visualizes large evolving graphs in Euclidean, Spherical, and Hyperbolic spaces, <http://graphael.cs.arizona.edu>
12. TetraTetris is a multi-user game and the first non-trivial application developed for the DiamondTouch table, <http://tetratetris.cs.arizona.edu>
13. DT is an interactive, multi-user application designed for the DiamondTouch table for discovering simultaneous planar graph embeddings, <http://dt.cs.arizona.edu>
14. GMorph is a system for smooth, continuous, and intersection-free morphing of planar graph drawings in 2D Euclidean space, <http://gmorph.cs.arizona.edu>
15. SimG is a system for simultaneously visualizing multiple graphs defined on a common set of vertices, <http://simg.cs.arizona.edu>
16. SPLaT is a web-spider and reviewer's workbench based on text analysis for self-plagiarism detection, <http://splat.cs.arizona.edu>

Patents

Y. Hu, E. Gansner, S. Kobourov, C. Volinsky, "Visualization and representation of data clusters and relations," US Patent 8,970,593, 2015

Grants

1. PI, *Algorithms for Geometric Graph Representations*, NSF-CCF, \$450,000, 2017-20
2. co-PI, *UA-TRIPODS: Building Theoretical Foundations for Data Sciences*, NSF-CCF, \$1,368,500, 2017-20
3. PI, *Visualizing the Knowledge Landscape*, UA-ORD, \$268,944, 2016-2018
4. co-PI, *T2 Diabetes Risk Detection via Machine Learning and Visualization*, UA-ORD, \$97,356, 2017-2018
5. PI, *Geometry and Combinatorics of Intersections and Contacts*, NSF-CCF, \$60,002, 2016-17
6. PI, *Putting Network Security on the Map*, Office of Naval Research, \$4,157,490, 2011-16
7. PI, *ImageQuest: Calibrated Imaging and Validated Analysis*, NSF-IBIV, \$1,268,593, 2010-13
8. PI, *CAREER: Embedding, Morphing, & Visualizing Dynamic Graphs*, NSF-CCF, \$419,645, 2006-11
9. PI, *Algorithms for Visualizing Data with Contact Graphs*, NSF-CCF, \$296,001, 2011-14
10. PI, *Visualization of Giga-Graphs and Graph Processes*, NSF-ACR, \$240,358, 2002-05
11. PI, *Proportional Graph Visualization*, Alexander von Humboldt Foundation, \$98,800, 2011-2013
12. PI, *Visualization of Giga-Graphs and Graph Processes*, NSF-REU Suppl., \$42,500, 2002-05
13. co-PI, *Collaborative Mind-Mapping Solution to the Obesity Challenge*, USDA, \$500,000, 2010-2012
14. co-PI, *Bootstrapping Broad-Coverage Network Services*, NSF-CNS, \$94,000, 2004-05

Steering Committees and Editorial Boards

Steering Committee, Graph Drawing, 2002–2004
 Editorial Board, Journal of Graph Algorithms and Applications
 Editorial Board, Graph Drawing E-print Archive
 Guest Editor, IEEE Transactions on Visualization and Computer Graphics

Program Chair

PC co-chair, 21st Conference on Algorithm Engineering and Experiments (ALENEX), San Diego, 2019
 Co-chair, Dagstuhl Seminar 16452, "Beyond-Planar Graphs: Algorithmics and Combinatorics", Germany, 2016
 Co-chair, Dagstuhl Seminar 13151, "Drawing Graphs and Maps with Curves", Germany, 2013
 Co-chair, Dagstuhl Seminar 12261, "Putting Data on the Map", Germany, 2012
 PC co-chair, 5th IEEE Pacific Visualization Symposium (PacificVis), Songdo, Korea, 2011

Co-chair, Dagstuhl Seminar 11191, “Graph Drawing with Algorithm Engineering Methods”, Germany, 2011
Co-chair, Dagstuhl Seminar 08191, “Graph Drawing Applications to Bioinformatics and Social Sciences”, 2008
Chair, 13th Annual Graph Drawing Contest Committee, Karlsruhe, Germany, 2006
Co-chair, Dagstuhl Seminar 05191, “Graph Drawing”, Germany, 2005
Chair, 12th Annual Graph Drawing Contest Committee, Limerick, Ireland, 2005
Chair, 11th Annual Graph Drawing Contest Committee, New York, NY, 2004
PC co-chair, 10th International Symposium on Graph Drawing (GD), Irvine, CA, 2002

Program Committee Service

PC member, 26nd International Symposium on Graph Drawing (GD), Barcelona, 2018
PC member, 11th IEEE Pacific Visualization Symposium (PacificVis), Kobe, Japan, 2018
PC member, IEEE Visual Analytics Science and Technology Conference (VAST), Phoenix AZ, 2017
PC member, 19th IEEE Eurographics Conference on Visualization (EUROVIS), Barcelona, Spain, 2017
PC member, 10th IEEE Pacific Visualization Symposium (PacificVis), Seoul, Korea, 2017
PC member, 21th IEEE Information Visualization Symposium (INFOVIS), Baltimore, 2016
PC member, 18th IEEE Eurographics Conference on Visualization (EUROVIS), Groningen, Netherlands, 2016
PC member, 10th IEEE Pacific Visualization Symposium (PacificVis), Taipei, Taiwan, 2016
PC member, IEEE Conference on Software Visualization (VISSOFT), Raleigh, North Carolina, 2016
PC member, 24nd International Symposium on Graph Drawing (GD), Athens, 2016
PC member, 7th Intl. Conf. on Information, Intelligence, Systems and Applications (IISA), Greece, 2016
PC member, 21th IEEE Information Visualization Symposium (INFOVIS), Chicago, IL, 2015
PC member, 17th IEEE Eurographics Conference on Visualization (EUROVIS), Cagliari, Italy, 2015
PC member, 8th IEEE Pacific Visualization Symposium (PacificVis), Hangzhou, China, 2015
PC member, 20th IEEE Information Visualization Symposium (INFOVIS), Paris, France, 2014
PC member, 16th IEEE Eurographics Conference on Visualization (EuroVis), Swansea, UK, 2014
PC member, IEEE Conference on Software Visualization (VISSOFT), Victoria, BC, Canada, 2014
PC member, 22nd International Symposium on Graph Drawing (GD), Würzburg, Germany, 2014
PC member, 7th IEEE Pacific Visualization Symposium (PacificVis), Yokohama, Japan, 2014
PC member, IEEE Conference on Software Visualization (VISSOFT), Eindhoven, Netherlands, 2013
PC member, 23st Fall Workshop on Computational Geometry (FWCG), New York NY, 2013
PC member, 6th IEEE Pacific Visualization Symposium (PacificVis), Sydney, Australia, 2012
PC member, 20th International Symposium on Graph Drawing (GD), Seattle WA, 2012
PC member, 21st Fall Workshop on Computational Geometry (FWCG), New York NY, 2011
PC member, 18th International Symposium on Graph Drawing (GD), Konstanz, Germany, 2010
PC member, 7th ACM Symposium on Software Visualization (SOFTVIS), Salt Lake City UT, 2010
PC member, 16th European Symposium on Algorithms (ESA), Karlsruhe, Germany, 2008
PC member, 16th International Symposium on Graph Drawing (GD), Crete, Greece, 2008
PC member, 3rd International Conference on Human Computer Interaction, Innsbruck, Austria, 2008
PC member, 17th ACM-SIAM Symposium on Discrete Algorithms (SODA), Miami FL, 2006
PC member, 3rd ACM Symposium on Software Visualization (SOFTVIS), Brighton UK, 2006
PC member, 14th International Symposium on Graph Drawing (GD), Karlsruhe, Germany, 2006
PC member, 8th International Symposium on Graph Drawing (GD), Williamsburg, VA, 2000

Conference Committee Service

Organizer, NSF Postdoctoral Conference, Tucson, AZ, 2016
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

Postdoctoral Advisees

Carsten Görg (PhD, Universität Trier), 2006
Katharina Zweig (PhD, Universität Tübingen), 2007
Michael Schulz (PhD, Universität zu Köln), 2008
Aparna Das (PhD, Brown University), 2010–2012
Thienne Johnson (PhD, University of Sao Paulo, Brazil), April 2011-13

Joe Fowler (PhD, University of Arizona), April 2011-13
Sergey Pupyrev (PhD, Ural State University), January 2013 –2015
Paolo Simonetto (PhD, University of Bordeaux), August 2013–2015
Iqbal Hossein (PhD, Bangladesh University of Engineering and Technology), April 2016 –
Faryad Sahneh (PhD, Kansas State University), October 2017 –
Felice De Luca (PhD, University of Perugia), January 2018 –

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, “How to Color a Map,” December 2014
Jawaherul Alam, “Contact Representations of Graphs in 2D and 3D,” May 2015
Sabrina Nusrat, “Cartogram Visualization: Methods, Applications, and Effectiveness”, June 2017
Reyan Ahmed, 2nd year PhD student
Richard Spence, 1st year PhD student

Courses Taught and Developed

Algorithmic Information Visualization (developed and taught at Arizona)
Algorithms and Data Structures (developed and taught at the University of Botswana)
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 in C++ (revised and taught at Hopkins)
Design and Analysis of Algorithms (revised and taught at Arizona)
Experimental Algorithmics, or Making Algorithms Work (developed and taught at Arizona)
Geometric Representation of Graphs (developed and taught at Charles University)
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)
Operating Systems (revised and taught at Dartmouth)
Research Methods in Computer Science (developed and taught at the University of 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. Kwan-Liu Ma, Department of Computer Science, University of California
Davis, CA 92697, ma@cs.ucdavis.edu
Dr. Stephen North, Infovisible, scnorth@gmail.com