

Ali Pınar

CONTACT

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RESEARCH INTERESTS Modeling and analysis of complex networks, graph algorithms, graph mining, cyber security, network inference, computational electric power systems, data analysis, combinatorial algorithms, combinatorial scientific computing, parallel and high performance computing, interconnection networks, scientific computing.

EDUCATION **University of Illinois at Urbana-Champaign (UIUC)**

- Ph.D. in Computer Science, 2001
with the option of Computational Science and Engineering
 - Thesis title: “Combinatorial Algorithms in Scientific Computing,”
 - Co-advisors: Michael Heath and Bruce Hendrickson

Bilkent University, Ankara, Turkey

- M.S. in Computer Engineering and Information Science, 1996
 - Thesis title: “Decomposing Linear Programs for Parallel Solution,”
 - Advisor: Cevdet Aykanat
- B. S. in Computer Engineering and Information Science, 1994

HONORS, AWARDS AND RECOGNITION

- Employee Recognition Award a Individual Technical Excellence, 2016
Sandia National Laboratories
- Distinguished Member, Association of Computing Machinery (ACM) 2015
- Best Paper Award, International Conference on Data Mining (ICDM) 2015.
- Best Paper Prize Finalist, International Conference on World Wide Web (WWW) 2015.
- Elected and served as *Chair of SIAM Activity Group on Supercomputing* (Jan 1, 2014–Dec 31, 2015)
- Best Research Paper Award, SIAM International Conference on Data Mining (SDM), 2013
- Co-author for Best Student Paper Award, 19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2013
- Senior member, Institute of Electrical and Electronics Engineers (IEEE) (2012-)

- Elected and served as *Program Director of SIAM Activity Group on Supercomputing*
(Jan 1, 2012–Dec 31, 2013)
- Senior member, Association of Computing Machinery (ACM) (2011–)
- Elected and served as *Secretary of SIAM Activity Group on Supercomputing*
(Jan 1, 2008–Dec 31, 2009)
- Research Grant (2001–2004), Principal Investigator
“Accurate Characterization of Real Networks from Inaccurate Measurements,”
funded under the Laboratory Directed Research Program for \$650K/2 years
- Research Grant (2001–2004), Principal Investigator
“Graph Learning in Knowledge Bases,”
funded under the Laboratory Directed Research Program for \$150K/3 years
- Research Grant (2012–2015), co-Principal Investigator
“Fast algorithms for Evolving graphs via Assays, Sampling, & Tensors (FEAST)”
funded by DARPA Defense Sciences Office \$2.8M/3 years
- Research Grant (2009–2012), Principal Investigator
“Scalable Methods for Representing, Characterizing, and Generating Large Graphs,”
funded by DOE Office of Science, Applied Mathematics program \$2.1M/3 years
- Research Grant (2004–2007), Principal Investigator
“Advanced Computational Tools for Electric Power Systems,”
funded under the Laboratory Directed Research Program for \$650K/3 years
- Research Grant (2001–2004), Principal Investigator
“Combinatorial Algorithms and Scientific Computing,”
funded under the Laboratory Directed Research Program for \$265K/3 years
- SPOT Awards
 - Sandia National Laboratories, 2009, 2009, 2015, 2016
 - Lawrence Berkeley National Laboratory 2005
- *John Von Neumann Research Fellowship in Computational Science*,
by Sandia National Laboratories, 2001 (declined)
- *Alston S. Householder Fellowship in Scientific Computing*,
by Oak Ridge National Laboratory, 2001 (declined)
- *Outstanding Graduate Student Service Award*,
Dept. of Computer Science, U. of Illinois at Urbana-Champaign, 2000

PROFESSIONAL
EXPERIENCE

- Distinguished Member of Technical Staff (Jan 2016 –)
Principal Member of Technical Staff (Oct 2008 – Jan 2016)
Sandia National Laboratories

- Computer Systems Engineer III, (May, 2004 – Oct 2008)
Lawrence Berkeley National Laboratory
- Postdoctoral Researcher, (Oct, 2001 – May, 2004)
Lawrence Berkeley National Laboratory
- Visiting Researcher, (summers 1999, 2000)
Sandia National Laboratories
- Research Assistant, (Aug, 1997 – Aug, 2001)
Department of Computer Science
Computational Science and Engineering Program, UIUC
- Teaching Assistant, (Sep, 1994 – July 1997)
Dept. of Computer Engineering and Information Science,
Bilkent University, Ankara, Turkey

TEACHING
AND
SUPERVISING
EXPERIENCE

- Postdoctoral fellows supervised (current positions in parentheses)
 - A. Erdem Sariyuce, Von Neumann postdoc, 2015–, (Sandia)
 - Jianqiang Cheng, 2015–2016, (Prof. at U. Arizona)
 - Madhav Jha, Von Neumann postdoc, 2013–2014, (Zenefits)
 - Nurcan Durak, postdoc, 2011–2012, Louisville U. (Rocket Fuel)
 - David Gleich, Von Neumann postdoc, 2010–2011, (Prof. at Purdue U.)
 - Vanessa Lopez, postdoc, 2005–2006, UIUC (IBM T.J. Watson)
- Summer students
 - Shweta Jain, summer student, 2016, (student at UC Santa Cruz)
 - A. Erdem Sariyuce, summer student, 2014, (von Neumann fellow at Sandia)
 - SM Arifuzzaman, summer student, 2014 Virginia Tech (Prof. at U. New Orleans)
 - Chengbin Peng, visiting student, 2014, (postdoc. at KAUST)
 - Chris Quinn, Krell fellow, 2012, (Prof. at Purdue U.)
 - Christine Task, summer student, 2012, (Knexus)
 - Isabelle Stanton, summer student, 2010, (Google)
 - Matthew Rocklin, summer student, 2010, (Continuum Analytics)
 - Adam Reichert, summer student, 2006, (Microsoft)
 - Yonatan Fogel, summer student, 2006, (Amazon)
 - Virginia Vassilevska, summer student, 2003, (Prof. at Stanford)
 - Manmeet Singh, summer student, 2003, (United Airlines)
 - Tao Tao, summer student, 2002, (Airbnb)
 - Feida Zhu, summer student, 2002, (Prof. at Singapore Management U.)

JOURNAL
PUBLICATIONS

1. C. Quinn, A. Pinar, and N. Kiyavash, "Bounded Degree Connected Approximations of Stochastic Networks," to appear in *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, preprint available as: [arXiv:1506.04767](https://arxiv.org/abs/1506.04767)

2. E. Sariyuce, C. Seshadhri, A. Pinar, and U. Catalyurek, “Nucleus Decompositions for Identifying Hierarchy of Dense Subgraphs,” to appear in *ACM Transactions on the Web*.
3. S. Aksoy, T. Kolda, A. Pinar, “Measuring and Modeling Bipartite Graphs,” to appear in. *Journal of Complex Networks*, [arXiv:1607.08673](#).
4. C. Safta, R. Chen, H. Najm, A. Pinar, and J. Watson, “Efficient Uncertainty Quantification in Stochastic Economic Dispatch,” to appear in *IEEE T. Power Systems*, preprint available as: [arXiv:1508.04731](#).
5. J. Bennett, A. Bhagatwala, J. Chen, C. Seshadhri, A. Pinar, and M. Salloum, “Trigger Detection for Adaptive Scientific Workflows Using Percentile Sampling,” *SIAM Journal on Scientific Computing*, preprint available as: [arXiv:1506.08258](#)
6. C. Seshadhri, A. Pinar, N. Durak, and T. Kolda, “Directed closure measures for networks with reciprocity,” to appear in *Journal of Complex Networks*, preprint available as [arXiv:1302:6220](#)
7. R. Chen, N. Fan, A. Pinar, and J. Watson, “Contingency-Constrained Unit Commitment with Post-Contingency Corrective Recourse,” *Annals of Operations Research*, pages: 1–27, Dec, 2014; preprint available as [arXiv:1404.2964](#).
8. M. Jha, C. Seshadhri, and A. Pinar, “A space efficient streaming algorithm for estimating transitivity and triangle counts using the birthday paradox,” *ACM Transactions on Knowledge Discovery from Data*, Vol. 9, No. 3, pages 15:1–15:21, 2015; preprint available as [arXiv:1212.2264](#).
9. J. Ray, A. Pinar, and C. Seshadhri, “A stopping criterion for Markov chains when generating independent random graphs,” *Journal of Complex Networks* 2014; preprint available as [arXiv:1210.8184](#).
10. T. Kolda, A. Pinar, T. Plantenga, and C. Seshadhri, “A Scalable Generative Graph Model with Community Structure,” *SIAM Journal on Scientific Computing*, Vol. 36, No. 5, pages: C424–C452, 2014; preprint available as [arXiv:1302.6636](#).
11. C. Seshadhri, A. Pinar, and T. Kolda, “Wedge Sampling for Computing Clustering Coefficients and Triangle Counts on Large Graphs,” *Statistical Analysis and Data Mining* special issue for “Best of SDM 2013,” Vol. 7 No. 4, pages: 294–307, 2014; preprint available as [arXiv:1309.3321](#).
12. R. Chen, A. Cohn, N. Fan, and A. Pinar, “Contingency-Risk Informed Power System Design,” *IEEE Transactions on Power Systems* Vol. 29, No. 5, pages: 2087–2096, 2014; preprint available as [arXiv:1305.0780](#).
13. T. Kolda, A. Pinar, T. Plantenga, C. Seshadhri, and C. Task, “Counting Triangles in Massive Graphs with MapReduce,” *SIAM Journal on Scientific Computing*, Vol. 36, No. 5, pages: S48–S77; preprint available as [arXiv:1301.5887](#).
14. C. Seshadhri, A. Pinar, and T. Kolda, “An In-Depth Analysis of Stochastic Kronecker Graphs,” *Journal of the ACM*, Vol. 60, No.2, pages:13:1–13:32, 2013; preprint available as [arXiv:1102.5046](#).

15. M. Rocklin and A. Pinar, “[On Clustering of Graphs with Multiple Edge Types](#),” *Internet Mathematics*, Vol. 9, No. 1, pages 82–112, 2013; preprint available as [arXiv:1109.1605](#).
16. C. Seshadhri, T. Kolda, and A. Pinar, “[Community structure and scale-free collections of Erdős–Rényi graphs](#),” *Physical Review E*, Vol. 85, No. 5, pages: 056109, 2012; preprint available as [arXiv:1112.3644](#).
17. I. Stanton and A. Pinar, “[Constructing and uniform sampling of graphs with prescribed joint degree distribution using Markov Chains](#),” *ACM Journal on Experimental Algorithmics*, Vol. 17, No. 1, 2012; preprint available as [arXiv:1103.4875](#).
18. E. Kayaaslan, A. Pinar, U. Catalyurek, and C. Aykanat, “[Partitioning Hypergraphs in Scientific Computing Applications through Vertex Separators on Graphs](#),” *SIAM Journal on Scientific Computing*, Vol. 34, No. 2, pages A970–A992, 2012; preprint available as [arXiv:1103.0106](#).
19. C. Janssen, H. Adalsteinsson, S. Cranford, J. Kenny, A. Pinar, D. Evensky, and J. Mayo, “[A Simulator for Large-scale Parallel Computer Architectures](#),” *International Journal of Distributed Systems and Technology*, Vol. 1, No. 2, pages 57–73, 2010; [preprint](#).
20. A. Pinar, J. Meza, V. Donde, and B. Lesieutre, “[Optimization Strategies for the Vulnerability Analysis of the Power Grid](#),” *SIAM Journal on Optimization*, Vol. 20, No. 4, pages 1786–1810, 2010; [preprint](#).
21. S. Kamil, L. Oliker, A. Pinar, and J. Shalf, “[Communication Requirements and Interconnect Optimization for High-End Scientific Applications](#),” *IEEE Transactions on Parallel and Distributed Computing*, Vol. 21, No. 2, pages 188–202, 2010; [preprint](#).
22. A. Pinar, E. Tabak, and C. Aykanat, “[One dimensional partitioning for heterogeneous systems](#),” *Journal of Parallel and Distributed Computing*, Vol. 68, No. 11, pages 1473–1486, 2008; [preprint](#).
23. V. Donde, V. Lopez, B. Lesieutre, A. Pinar, C. Yang, and J. Meza, “[Severe Multiple Contingency Screening in Electric Power Systems](#),” *IEEE Transactions on Power Systems*, Vol. 23, No. 2, pages 406–417, 2008; [preprint](#).
24. A. Pinar, E. Chow, and A. Pothén, “[Combinatorial Techniques for Constructing Sparse Null-space Bases](#),” *Electronic Transactions on Numerical Analysis, special volume on saddle point problems: numerical solution and applications*, Vol. 22, pages 122–145, 2006; [preprint](#).
25. A. Pinar and B. Hendrickson, “[Improving Load Balance with Flexibly Assignable Tasks](#),” *IEEE Transactions on Parallel and Distributed Systems*, Vol. 16, No. 10, pages 956–965, 2005; [preprint](#).
26. A. Pinar and V. Vassilevska, “[Finding Nonoverlapping Substructures of a Sparse Matrix](#),” *Electronic Transactions on Numerical Analysis, special volume on combinatorial scientific computing*, Vol. 21, pages 107–124, 2005; [preprint](#).

27. A. Pinar and B. Hendrickson, “[Interprocessor Communication with Limited Memory](#),” *IEEE Transactions on Parallel and Distributed Systems*, Vol. 15, No. 7, pages 606–616, 2004; [preprint](#).
28. A. Pinar and C. Aykanat, “[Fast Optimal Load Balancing Algorithms for 1D Partitioning](#),” *Journal of Parallel and Distributed Computing*, Vol. 64, No. 8, pages 974–996, 2004; [preprint](#).
29. C. Aykanat, A. Pinar, and U. Catalyurek, “[Permuting Sparse Rectangular Matrices into Block-Diagonal Form](#),” *SIAM Journal on Scientific Computing*, Vol. 25, No. 6, pages 1860–1879, 2004; [preprint](#).
30. A. Pinar and C.L. Liu, “[Compacting Sequences with Invariant Transition Frequencies](#),” *ACM Transactions on Design Automation of Electronic Systems*, Vol. 8, No. 2, pages 214–221, 2003; [preprint](#).

PENDING
JOURNAL
PUBLICATIONS

31. J. Cheng, R. Chen, H. Najm, A. Pinar, C. Safta, and J. Watson, “Chance Constrained Economic Dispatch Problem with Renewable Energy and Energy Storage,” submitted for journal publication.
32. J. Cheng, R. Chen, H. Najm, A. Pinar, C. Safta, and J. Watson, “[Distributionally Robust Optimization with Principal Component Analysis](#),” submitted for journal publication.

BOOK
CHAPTERS

33. C. Seshadhri, A. Pinar, D. Thompson, and J. Bennett, “[Sublinear Algorithms for Extreme-scale Data Analysis](#),” *Topological and Statistical Methods for Complex Data: Tackling Large-Scale, High-Dimensional, and Multivariate Data Sets*, editors: J. Bennett, F. Vivodtzev, and V. Pascucci, Springer, 2014.
34. A. Pinar and B. Hendrickson, “[Combinatorial Parallel and Scientific Computing](#),” chapter in *Parallel Processing for Scientific Computing*, editors: M. Heroux, P. Raghavan, and H. Simon, SIAM, 2006.

REFEREED
CONFERENCE
AND
WORKSHOP
PUBLICATIONS

35. S. Soundarajan, T. Eliassi-Rad, B. Gallagher, and A. Pinar “ ϵ -WGX: Adaptive Edge Probing for Enhancing Incomplete Networks,” to appear in ACM Web Science, 2017.
36. C. Quinn, A. Pinar, J. Gao, and L. Su, “Robust Sparse Approximations for Stochastic Dynamical Systems,” to appear in Proc. 20th International Federation of Automatic Control World Congress.
37. A. Pinar, C. Seshadhri, and V. Vishal, “ESCAPE: Efficiently Counting All 5-Vertex Subgraphs,” to appear in WWW 2017, preprint available as [arXiv:1610.09411](#).
38. E. Sariyuce and A. Pinar, “Fast Hierarchy Construction for Dense Subgraphs,” to appear in VLDB 2017; preprint available as [arXiv:1610.01961](#).

39. S. Soundarajan, T. Eliassi-Rad, B. Gallagher, and A. Pinar, “[MaxReach: Reducing Network Incompleteness through Node Probes](#),” in Proc. ASONAM 2016.
40. C. Quinn, A. Pinar, J. Gao, and L. Su, “[Sparse Approximations of Directed Information Graphs](#),” in *Proc. IEEE International Symposium on Information Theory (ISIT)*, 2016.
41. S. Soundarajan, T. Eliassi-Rad, B. Gallagher, and A. Pinar, “MaxOutProbe: An Algorithm for Increasing the Size of Partially Observed Networks,” in Proc. NIPS workshop Networks in the Social and Information Sciences.
42. M. Salloum, J. Bennett, A. Pinar, A. Bhagatwala, J. Chen, Enabling adaptive scientific workflows via trigger detection, in *Proc. ISAV 2015: In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization*, 2015; preprint available as: [arXiv:1508.04731](#)
43. G. Ballard, T. Kolda, A. Pinar, and C. Seshadhri, “Diamond Sampling for Approximate Maximum All-pairs Dot-product (MAD) Search,” in ICDM 2015 (**Best Research Paper**) ; preprint available as [arXiv:1506:03872](#).
44. E. Sariyuce, C. Seshadhri, A. Pinar, and U. Catalyurek, “[Finding Overlapping and Hierarchical Dense Subgraphs using Nuclear Decompositions](#),” *Proc. WWW 2015*, pages 927–937, 2015; **Best Paper Award Finalist**, preprint available as [arXiv:1411.3312](#).
45. M. Jha, A. Pinar, and C. Seshadhri, “[Path Sampling: A Fast and Provable Method for Estimating 4-Vertex Subgraph Counts](#),” *Proc. WWW 2015*, pages 495–505, 2015; preprint available as [arXiv:1411.4942](#).
46. M. Jha, C. Seshadhri, and A. Pinar, “Counting Triangles in Real-World Graph Streams: Dealing with Repeated Edges and Time Windows,” Proc. Asilomar Conference on Signals, Systems, and Computers 2015. preprint available as [arXiv:1310:7665](#).
47. C. Safta, R. Chen, H. Najm, A. Pinar, and J. Watson, “[Toward Using Surrogates to Accelerate Solution of Stochastic Electricity Grid Operations Problems](#),” in *Proc. 47th North American Power Symposium*, Pullman, WA, September 2014; preprint available as [arXiv:1407.2232](#).
48. D. Thompson, J. Bennett, C. Seshadhri, and A. Pinar, “[A provably-robust sampling method for generating colormaps of large data](#),” *Proc. IEEE Symposium on Large-Scale Data Analysis and Visualization (LDAV)*, 2013.
49. A. Singhal, K. Subbian, T. Kolda, A. Pinar, and J. Srivastava, “[Dynamics of Trust Reciprocation in Multi-Relational Networks](#),” *Proc. the IEEE/ACM International Conf. on Social Networks Analysis and Mining (ASONAM)*, 2013.
50. M. Jha, C. Seshadhri, and A. Pinar, “[A Space Efficient Streaming Algorithm for Triangle Counting using the Birthday Paradox](#),” *Proc. ACM Knowledge Discovery and Data Mining (KDD)*, 2013; (**Best Student Paper**) preprint available as [arXiv:1212.2264](#).

51. C. Quinn, A. Pinar, and N. Kiyavash, “[Optimal Bounded-Degree Approximations of Joint Distributions of Networks of Stochastic Processes](#),” *Proc. IEEE International Symposium on Information Theory (ISIT)*, 2013.
52. N. Durak, T. Kolda, A. Pinar, and C. Seshadhri, “[A Scalable Null Model to Match All Degree Distributions: In, Out, and Reciprocal](#),” *Proc. IEEE Network Science*, preprint available as [arXiv:1210.5288](#).
53. C. Seshadhri, A. Pinar, and T. Kolda, “[Triadic Measures on Graphs: The Power of Wedge Sampling](#),” *Proc. SIAM Data Mining, 2013*; (Best Research Paper), preprint available as [arXiv:1202.5230](#).
54. N. Durak, A. Pinar, T. Kolda, C. Seshadhri, “[The degree relations of triangles in real-world networks and graph models](#),” *Proc. ACM International Conf. on Information and Knowledge Management (CIKM)*, 2012.
55. J. Ray, A. Pinar, and C. Seshadhri, “[Are we there yet? When to stop a Markov chain while generating random graphs](#),” *Proc. Workshop on Algorithms for the Web Graph (WAW)*, 2012; preprint available as [arXiv:1202.3473](#).
56. R. Chen, A. Cohn, N. Fan, and A. Pinar, “[N - k - ε Survivable Power System Design](#),” in *12th International Conf. on Probabilistic Methods Applied to Power Systems (PMAPS12)*.
57. A. Pinar, C. Seshadhri, and T. Kolda, “[The Similarity of Stochastic Kronecker Graphs to Edge-Configuration Models](#),” in *Proc. SIAM Data Mining, 2012*; preprint available as [arXiv:1110.4925](#).
58. C. Seshadhri, A. Pinar, and T. Kolda, “[An In-Depth Study of Stochastic Kronecker Graphs](#),” *Proc. International Conf. on Data Mining (ICDM)*, 2011.
59. R. Chen, A. Cohn, and A. Pinar, “[An Implicit Optimization Approach for Survivable Network Design](#),” *Proc. 2011 IEEE 1st International Network Science Workshop (NSW 2011)*; preprint available as [arXiv:1109.1801](#).
60. M. Rocklin and A. Pinar, “[Latent Clustering on Graphs with Multiple Edge Types](#),” *Proc. 8th Workshop on Algorithms and Models for the Web Graph (WAW)*, 2011; preprint available as [arXiv:1109.1605](#).
61. I. Stanton and A. Pinar, “[Constructing and sampling graphs with prescribed joint degree distribution using Markov Chains](#),” *Proc. SIAM Workshop on Algorithm Engineering and Experiments (ALENEX)*, 2011;
62. M. Rocklin and A. Pinar, “[Computing an Aggregate Edge-weight function for Clustering Graphs with Multiple Edge Types](#),” in *Proc. 7th Workshop on Algorithms and Models for the Web Graph (WAW)*, 2010.
63. B. Lesieutre, A. Pinar, and S. Roy, “[Power System Extreme Event Detection: The Vulnerability Frontier](#),” in *Proc. 41st Hawaii International Conf. on System Sciences*, pages: 184, Waikoloa, Big Island, HI, 2008.
64. S. Kamil, A. Pinar, D. Gunter, M. Lijewski, L. Olikier, and J. Shalf, “[Reconfigurable hybrid interconnection for static and dynamic scientific applications](#),” *Proc. of the 4th International Conf. on Computing Frontiers*, pages: 183–195, Ischia, Italy, 2007.

65. A. Pinar, A. Reichert, and B. Lesieutre, “[Computing Criticality of Lines in a Power System](#),” *Proc. 2007 IEEE International Symposium on Circuits and Systems*, pages: 65–68, New Orleans, LA, May 2007.
66. B. Lesieutre, S. Roy, V. Donde, and A. Pinar, “[Power system extreme event analysis using graph partitioning](#),” *Proc. 39th North American Power Symposium*, Carbondale, IL, October 2006.
67. A. Pinar, T. Tao, and H. Ferhatosmanoglu, “[Compressing Bitmap Indices by Data Reorganization](#),” *Proc. 21st International Conf. on Data Engineering (ICDE)*, pages: 310–321, 2005.
68. V. Donde, V. Lopez, B. Lesieutre, A. Pinar, C. Yang, and J. Meza, “[Identification of severe multiple contingencies in electric power networks](#),” *Proc. 38th North American Power Symposium*, Ames, IA, October 2005.
69. A. Pinar and B. Hendrickson, “[Exploiting Flexibly Assignable Work to Improve Load Balance](#),” *Proc. ACM 14th Symp. Parallel Algorithms and Architectures (SPAA)*, pages: 155–163, 2002.
70. A. Pinar and B. Hendrickson, “[Graph Partitioning for Complex Objectives](#),” *Proc. 15th IEEE International Parallel and Distributed Processing Symp. (IPDPS)*, 2001.
71. A. Pinar and B. Hendrickson, “[Communication Support for Adaptive Computation](#),” in *Proc. SIAM Conf. on Parallel Processing for Scientific Computing*, 2001.
72. A. Pinar and B. Hendrickson, “[Interprocessor Communication with Memory Constraints](#),” *Proc. ACM Symp. Parallel Algorithms and Architectures (SPAA)*, pages: 39–45, 2000.
73. L. Fleischer, B. Hendrickson, and A. Pinar, “[On Identifying Strongly Connected Components in Parallel](#),” *Lecture Notes in Computer Science*, Vol. 1586, pages: 505–511, 2000.
74. A. Pinar and M. Heath, “[Improving Performance of Sparse Matrix-Vector Multiplication](#),” *Proc. Supercomputing 99*, 1999.
75. A. Pinar and C.L. Liu, “[Power Invariant Vector Sequence Compaction](#),” *Proc. 1998 IEEE/ACM International Conf. Computer Aided Design*, pages: 473–476, 1998.
76. A. Pinar and C. Aykanat, “[Sparse Matrix Decomposition with Optimal Load Balancing](#),” *Proc. International Conf. High Performance Computing (HiPC) 97*, pages: 224–229, 1997.
77. A. Pinar and C. Aykanat, “[An Effective Model to Decompose Linear Programs for Parallel Solution](#),” *Lecture Notes in Computer Science*, Vol. 1184, pages: 592–601, 1996.
78. A. Pinar, U. Catalyurek, C. Aykanat, and M. Pinar, “[Decomposing Linear Programs for Parallel Solution](#),” *Lecture Notes in Computer Science*, Vol. 1041, pages: 473–482, 1995.

79. A. Pinar, "A New Genetic Algorithm for Hypergraph Partitioning," *Proc. Turkish Artificial Intelligence and Neural Networks Symp. (TAINN) 96*, pages: 167–176, 1996.
80. A. Pinar and U. Cetintemel, "Wide-Area Distributed Selective Dissemination of Information," *Proc. Tenth International Symp. on Computer and Information Sciences (ISCIS)*, pages: 281–288, 1995.

OTHER
PUBLICATIONS

81. E. Sariyuce, C. Seshadhri, and A. Pinar, "Parallel Local Algorithms for Core, Truss, and Nucleus Decompositions," submitted for conference publication, 2017.
82. E. Sariyuce and A. Pinar, "Peeling Bipartite Networks for Dense Subgraph Discovery," submitted for conference publication, 2016; [arXiv:1611.02756](https://arxiv.org/abs/1611.02756).
83. C. Peng, T. Kolda, and A. Pinar, "Accelerating Community Detection by Using k -core subgraphs," [arXiv:1403.2226](https://arxiv.org/abs/1403.2226).
84. U. Meyer, H. Meyerhenke, A. Pinar, and I. Safro "High-performance Graph Algorithms and Applications in Computational Science," Dagstuhl report 2015
85. F. Alexander, M. Anitescu, J. Bell, D. Brown, M. Ferris, M. Luskin, S. Mehrotra, B. Moser, A. Pinar, A. Tartakovsky, K. Willcox, S. Wright, and V. Zavala, "A Multifaceted Mathematical Approach for Complex Systems," DOE Office of Advanced Scientific Computing Research, 2011.
86. E. Otoo, A. Pinar, and D. Rotem, "A Linear Approximation Algorithm for 2-Dimensional Vector Packing," [arXiv:1103.0260](https://arxiv.org/abs/1103.0260), 2011.
87. D. Brown, P. Messina, D. Keyes, J. Morrison, R. Lucas, J. Shalf, P. Beckman, R. Brightwell, A. Geist, J. Vetter, B. Chamberlain, E. Lusk, J. Bell, M. Shephard, M. Anitescu, D. Estep, B. Hendrickson, A. Pinar, and M. Heroux, "Scientific grand challenges: Crosscutting technologies for computing at the exascale," Tech. report, Pacific Northwest National Laboratory, PNNL-20168, 2010.
88. S. Poon, A. Pinar, C. Aragon, and P. Nugent, "Time-Domain Visual Analytics for Astronomical Scheduling," Sandia Technical Report 5282050, 2010.
89. E. Otoo, A. Pinar, D. Rotem, and S. C. Tsao, "A File Allocation Strategy for Energy-Efficient Disk Storage Systems," Technical Report: LBNL-637E, Lawrence Berkeley National Laboratory, Berkeley, CA, 2008.
90. P. Cesarz, G. Pomann, L. Torre, G. Villarosa, T. Flournoy, A. Pinar, and J. Meza, "Detecting Network Vulnerabilities Through Graph Theoretical Methods," Technical Report: LBNL-63487, Lawrence Berkeley National Laboratory, Berkeley, CA, 2007.
91. A. Pinar, Y. Fogel, and B. Lesieutre, "The Inhibiting Bisection Problem," Technical Report: LBNL-62142, Lawrence Berkeley National Laboratory, Berkeley, CA, 2006.
92. D. Coppersmith, L. Fleischer, B. Hendrickson, and A. Pinar, "A Divide-and-conquer Algorithm for Identifying Strongly Connected Components in Parallel," IBM Technical Report RC23744, 2005.

93. A. Pinar, “High Performance Combinatorial Algorithms,” Technical Report: LBNL-53989, Lawrence Berkeley National Laboratory, Berkeley, CA, 2003.
94. A. Pinar, M. Singh, and E. Ng, “Nested Dissection Orderings for LU Factorization of Unsymmetric Matrices with Static Pivoting,” extended abstract in Proc. SIAM Workshop on Combinatorial Scientific Computing, 2003.
95. A. Pinar, “Combinatorial Algorithms in Scientific Computing,” PhD. Thesis, University of Illinois at Urbana-Champaign, July 2001.
96. A. Pinar, “Decomposing Linear Programs for Parallel Solution,” M.S. Thesis, Bilkent University, Ankara, Turkey, July 1996.

SERVICES AND MEMBERSHIPS

- Associate Editor, SIAM J. Scientific Computing, (Jan 2014 –)
- Associate Editor, J. Complex Networks, Oxford University Press (Jan 2013 –)
- Member of the Editorial Board, SIAM News, (Mar 2015 –)
- Associate Editor, special issue of the SIAM J. Scientific Computing for CSE15
- Associate Editor, special issue of the SIAM J. Scientific Computing for CSE13
- Member, SIAM Committee on Programs and Conferences (2016–2018)
- Member, NSF Division of Mathematical Sciences Committee of Visitors, 2016
- Chair, SIAM Network Science Steering Committee (2016 –)
- Chair, SIAM Activity of Group on Supercomputing (2014–2015)
- Chair, SIAM Activity of Group on Supercomputing Awards Committee, 2013, 2015
- Program Director, SIAM Activity of Group on Supercomputing (2012–2013)
- Secretary, SIAM Activity of Group on Supercomputing (2008–2009)
- Member, SIAM Activity Group on Data Mining and Analytics, Nominating committee, 2013
- Co-chair,
 - Workshop on Incomplete Network Data (WIND), March 2016.
 - SIAM Conference on Parallel Processing for Scientific Computing, February 2014.
 - Dagstuhl Seminar on High-performance Graph Algorithms and Applications in Computational Science, Saarbrücken, Germany, Nov 2014.
 - SDM 2014 Workshop on Mining Networks and Graphs: A Big Data Analytic Challenge, Philadelphia, PA, April, 2014.
 - SIAM Workshop on Network Science, San Diego, CA, July, 2013.

- SIAM Workshop on Combinatorial Scientific Computing, Darmstadt, Germany, May 2011
- Program or Organizing Committee Member,
 - ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2015, 2016.
 - World Wide Web Conference, 2014, 2015, 2016, 2017.
 - IEEE International Parallel and Distributed Processing Symposium, 2008, 2013, 2014, 2015, 2016.
 - SIAM International Conference on Data Mining (SDM) 2012, 2013, 2014.
 - ACM International Conference on Information and Knowledge Management (CIKM), 2014, 2015, 2016.
 - Supercomputing 2015.
 - 2016 BigGraphs workshop, IEEE Conference on Big Data
 - 1st High Performance Graph Processing (HPGP) workshop, Kyoto, Japan, 2016.
 - MIT Lincoln Labs Graph Exploitation symposium, 2014, 2015, 2016, 2017.
 - SDM Workshop on Mining Networks and Graphs: A Big Data Analytic Challenge, 2015, 2016.
 - SIAM Workshop on Network Science, 2014, 2015, 2017.
 - International Workshop on Mining and Learning with Graphs (MLG), 2016, 2017.
 - Workshop on Streaming Graph Algorithms, 2014.
 - International Conference on Weblogs and Social Media (ICWSM), 2014.
 - 2013 IEEE International Conference on Big Data, 2013.
 - 5th International Workshop on Network Science for Communication Networks (NetSciCom), 2013.
 - DOE O. Science ASCR Applied Math PI Meeting, 2011.
 - International Conference on Distributed Computing Systems (ICDCS), 2011.
 - SIAM Conference on Parallel Processing for Scientific Computing, 2010.
 - International Symposium on Computer and Information Sciences (ISCIS) 2005, 2009.
 - SIAM Workshop on Combinatorial Scientific Computing, 2009.
 - International Conference on Grid and Pervasive Computing, 2006, 2007.
 - Annual International Conference in Parallel Processing (ICPP) 2006.
 - Annual International Conference on High Performance Computing (HiPC), 2005.
- Minisymposium Organizer,
 - “Uncertainty Quantification Methods for Power Grid Systems,” SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, March 2015

- “Analysis and Modeling of Static and Dynamic Networks,” SIAM Conference on Computational Science and Engineering, Boston, MA, February, 2013
- “Combinatorial Scientific Computing: Enabling Computational Science and Engineering through Combinatorial Algorithms,” International Conference on Industrial and Applied Mathematics, Vancouver, Canada, July 2011.
- “Optimization in Electric Power Systems,” SIAM Conference on Computational Science and Engineering, Reno, NV, February, 2011.
- “Combinatorial Methods in Applications of CSE,” SIAM Conference on Computational Science and Engineering,” Reno, NV, February, 2011.
- “Spectral Theory and Graphs,” SIAM Conference on Computational Science and Engineering, Reno, NV, February, 2011.
- “Mathematics of Complex Distributed Interconnected Systems,” SIAM Annual Meeting, Pittsburgh, PA, July 2010.
- “Combinatorial Scientific Computing,” SIAM Annual Meeting, Denver, CO, July 2009.
- “Optimization with Discrete and Continuous Variables,” SIAM Conference on Computational Science and Engineering, Mesa Verde, CA, February, 2007.
- “Computational Challenges in Electric Power Systems,” SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, February, 2006.
- “Parallel Graph Algorithms,” SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, February, 2006.
- “Computational Challenges in Electric Power Systems,” SIAM Conference on Computational Science and Engineering, Orlando, FL, February, 2005.
- “Combinatorial Algorithms and Parallel Computing,” SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, February, 2004.
- “Combinatorial Algorithms in Scientific Computing,” SIAM Conference on Computational Science and Engineering, San Diego, CA, February, 2003.
- Member, IEEE Computer Society Membership Development Subcommittee
- Review Panel Member
 - Programs for DOE Office of Science Advanced Scientific Computing Research, 2009, 2010.
 - NSF Information & Intelligent Systems Division, 2010
- Volunteer mentor for MentorNet (<http://www.mentornet.net/>)
- Reviewer, Journal of ACM, Nature Communications, SIAM J. Scientific Computing, SIAM J. Optimization, SIAM J. Discrete Mathematics, SIAM Review, SIAM J. Matrix Analysis, SIAM J. Control and Optimization, IEEE T. Parallel and Distributed Systems, IEEE T. Power Systems, IEEE T. Knowledge and Data

Engineering, IEEE/ACM Transactions on Networking, ACM T. on Mathematical Software, Informs J. Computing, Mathematical Programming, Mathematical and Computer Modeling, J. Parallel and Distributed Computing, Numerical Linear Algebra with Applications, Electronic Transactions on Numerical Analysis, Parallel Algorithms and Applications, Parallel Computing, Knowledge and Information Systems, Intl. J. High Performance Computing, Discrete and Applied Mathematics, Statistical Analysis and Data Mining, Data Mining and Knowledge Discovery, and many conferences.

- Member, Graduate Study Committee, Dept. of Computer Science, UIUC, 2000–2001.
- Member, Fellowships, Assistantships, and Admissions Committee, Dept. of Computer Science, UIUC, 1999–2000.
- Elected President of Faculty of Engineering Student Board, Bilkent University, Turkey (1992–1993).
- Elected Secretary of Faculty of Engineering Student Board, Bilkent University, Turkey (1991–1992).
- Secretary, IEEE Bilkent Student Branch, Bilkent University, Turkey (1991–1992).
- Founding member, Alumni Association of Istanbul High School of Sciences.

PROFESSIONAL SOCIETY MEMBERSHIPS

- Society of Industrial and Applied Mathematics (SIAM), and its activity groups
 - Supercomputing
 - Optimization
 - Computational Science and Engineering
 - Data Mining and Analytics
- Association of Computing Machinery (ACM), Distinguished member
 - SIG on Knowledge Discovery and Data Mining (SIGKDD)
 - SIG on High Performance Computing (SIGHPC)
- Institute of Electrical and Electronics Engineers (IEEE), Senior member
 - Computer Society

PRESENTATIONS AND INVITED TALKS

1. “Using Local Measurements to Infer Global Network Properties,” SIAM Conference on Optimization, Vancouver, BC, Canada, 2017.
2. “Models and Measurements for Big Graphs,” Plenary talk, Bay Area Discrete Math Day, Berkeley, CA 2016.
3. “Counting Triangles in Real-World Graph Streams: Dealing with Repeated Edges and Time Windows,” Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2015.

4. "Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions," International Conference on the World Wide Web, Florence, Italy, May, 2015.
5. "Path Sampling: A Fast and Provable Method for Estimating 4- vertex subgraph counts," International Conference on the World Wide Web, Florence, Italy, May, 2015.
6. "Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions," SIAM Workshop on Network Science, Snowbird, UT, May, 2015.
7. "A Combinatorial Approach to Vulnerability Analysis of the Power Grid," UC Santa Barbara Institute of Energy Efficiency Colloquium, Santa Barbara, CA, Jan 2015.
8. "Sampling and Streaming Algorithms to Find Small Patterns in BIG Graphs," Dagstuhl seminar, Wadern, Germany, Nov 2014.
9. "How Photonics can Help Large Scale Graph Analysis," DARPA Silicon Photonics Program PI meeting, Phoenix, AZ, Oct 2014.
10. "Sampling and Streaming Algorithms for Counting Small Patterns in Large Graphs," 2014 Graph Exploration Symposium, MIT Lincoln Labs, MA, August 2014.
11. "Fast Algorithms for Evolving Graphs via Assays, Sampling & Theory (FEAST)," DARPA GRAPHS program PI meeting, Arlington, VA, July 2014.
12. "Accelerating Community Detection by Using K-core Subgraphs," SIAM Workshop on Network Science, Chicago, IL, July, 2014.
13. "Resilience of the Electric Power Grid," Applied Computational Mathematics Colloquium, California Institute of Technology, Pasadena, CA, May 2014
14. "Counting Small Patterns in Large Graphs," SDM 2014 Workshop on Mining Networks and Graphs: A Big Data Analytic Challenge, Philadelphia, PA, April, 2014.
15. "Generating Large Graphs for Benchmarking," SIAM Conf. Parallel Processing, Portland, OR, February 2014.
16. "Sampling Algorithms to Count Frequent Patterns in Graphs," Simons Institute Workshop on Parallel and Distributed Algorithms for Inference and Optimization, Berkeley, CA, October, 2013.
17. "Sublinear Algorithms for In-situ & In-transit Data Analysis at Exascale," DOE ASCR Exascale Math Working Group Workshop (EXAMath13), Washington DC, August, 2013.
18. "A Scalable Null Model to Match All Degree Distributions: In, Out, and Reciprocal," IEEE Second Workshop on Network Science, West Point, NY, April, 2013.
19. "Analyzing, Modeling, and Generating BIG Networks," 2013 Graph Exploration Symposium, MIT Lincoln Labs, MA, April, 2013.

20. "Are We There Yet? When to Stop a Markov Chain While Generating Random Graphs," SIAM Conf. on Computational Science and Engineering, Boston, MA, February, 2013.
21. "The Blocked-Two-Level Erdos-Renyi Graph Model," INFORMS Computing Society Conference, Santa FE, NM, January, 2013.
22. "The Blocked-Two-Level Erdos-Renyi Graph Model," Current Challenges in Computing Network Science, Napa, CA, August 2012.
23. "The Blocked-Two-Level Erdos-Renyi Graph Model," Workshop on Algorithms for Modern Massive Data Sets, Stanford, CA, July 2012.
24. "Fast Counting of Patterns in Graphs," SIAM Annual Meeting, Minneapolis, MN, July 2012.
25. "Blocked-Two-Level Erdos-Renyi Graph Model," 16th Annual Signal & Imaging Sciences Workshop, Livermore, CA, May 2012.
26. "Contingency-Constrained Optimization for Electric Power Systems," Workshop on Power Grids as Complex Networks: Formulating Problems for Useful Science and Science Based Engineering, Santa Fe Institute, Santa Fe, NM, May 2012.
27. "The Inherent Community Structure in Real-World Graphs," SIAM Conf. Parallel Processing, Savannah, GA, February 2012.
28. "Scalable Methods for Characterizing and Generating Large Graphs," Joint Mathematics Meeting, Boston, MA, January 2012.
29. "Models for Generating Large Realistic Graphs," DOE ASCR Applied Math Program PI meeting, Washington DC, October 2011.
30. "Contingency-Constrained Optimization for Electric Power Systems," Scientific Computing series, IBM TJ Watson, Yorktown Heights, NY, August 2011.
31. "Modeling Complex Networks," ICIAM 2011, Vancouver, BC, Canada, July 2011.
32. "Constructing and Sampling Graphs with a Given Joint Degree Distribution," SIAM Workshop on Combinatorial Scientific Computing, Darmstadt Germany, May 2011.
33. "SST/macro: The Structural Simulation Toolkit macroscale components for coarse-grained architecture simulation," SIAM Workshop on Combinatorial Scientific Computing, Darmstadt Germany, May 2011.
34. "Contingency-constrained Power System Planning," SIAM Conf. on Optimization, Darmstadt Germany, May 2011.
35. "A Hitchhiker's guide to Choosing Parameters of Stochastic Kronecker Graphs," SIAM Conf. on Computational Science and Engineering, Reno, NV, February, 2011.

36. "SST/macro: The Structural Simulation Toolkit macroscale components for coarse-grained architecture simulation," SIAM Conf. on Computational Science and Engineering, Reno, NV, February, 2011.
37. "Security-constrained Optimization for Electric Power Systems," INFORMS Computing Society Conference (ICS2011), Monterey, CA, January, 2011.
38. "Computing an Aggregate Edge-weight function for Clustering Graphs with Multiple Edge Types," 7th Workshop on Algorithms and Models for the Web Graph (WAW10), Stanford, CA, December, 2010.
39. "Scalable Methods for Representing, Characterizing, and Generating Large Graphs," SIAM Annual Meeting, Pittsburgh, PA, July, 2010.
40. "Networks in Modeling and Simulation," SIAM Conf. on Parallel Processing for Scientific Computing, Seattle, WA, February, 2010.
41. "A Simulator for Large-scale Parallel Computer Architectures," poster presentation, SIAM Conf. on Parallel Processing for Scientific Computing, Seattle, WA, February, 2010.
42. "Scalable Interconnects for Scientific Workloads," SIAM Conf. on Computational Science and Engineering, Miami, FL, March 2009.
43. "Scalable Reconfigurable Interconnects," Workshop on Combinatorial Scientific Computing & Petascale Simulations (CSCAPES), Santa Fe, NM, June 2008.
44. "Combinatorial methods in scientific computing," Center for Advanced Computational Research Seminar, California Institute of Technology, Pasadena, CA, May 2008.
45. "Combinatorial Scientific Computing," Department Colloquium, Computer Science and Engineering, UC Riverside, Riverside, CA, March, 2008.
46. "Vulnerability Analysis of the Power Grid," Mathematical Sciences Research Institute Seminar, Berkeley, CA, June 2007.
47. "Vulnerability Analysis of the Power Grid," Georgia Institute of Technology High Performance Computing Seminar, Atlanta, GA, February 2007.
48. "Vulnerability Analysis of the Power Grid," SIAM Conf. on Computational Science and Engineering, Mesa Verde, CA, February 2007.
49. "Advanced Computational Tools for Electric Power Systems," SIAM Annual Meeting, Boston, MA, July 2006.
50. "Improving Performance of Bitmap Indexing," SIAM Workshop on Combinatorial Scientific Computing, Toulouse, France, June 2005
51. "Alternative Models for Load Balancing," SIAM Conf. on Parallel Processing for Scientific Computing 2004, San Francisco, CA, February, 2004.
52. "Nested Dissection Orderings for LU Factorization with Static Pivoting," SIAM Workshop on Combinatorial Scientific Computing, San Francisco, CA, February, 2004.

53. “Combinatorial Techniques for Constructing Sparse Null-space Bases,” SIAM Conf. on Applied Linear Algebra, Williamsburg, VA, July 2003.
54. “The Nice Basis Problem,” Bay Area Scientific Computing Day, Stanford University, Stanford, CA, March, 2003.
55. “The Nice Basis Problem,” Mathematics and Computer Science Division Seminar, Argonne National Laboratory, Lemont, IL, May, 2003.
56. “Exploiting Flexibly Assignable Work to Improve Load Balance,” SIAM 50th Anniversary and 2002 Annual Meeting, Philadelphia, PA, July, 2002.
57. “Partitioning for Complex Objectives,” International Parallel and Distributed Processing Symp., San Francisco, CA, April, 2001.
58. “Combinatorial Algorithms for Adaptive Computation,” NERSC Scientific Computing Seminar, Berkeley, CA, April, 2001.
59. “Communication Support for Adaptive Computation,” SIAM Conf. on Parallel Processing for Scientific Computing 2001, Portsmouth, VA, March, 2001.
60. “Interprocessor Communication with Memory Constraints,” ACM Symp. on Parallel Algorithms and Architectures (SPAA), Bar Harbor, ME, July, 2000.
61. “On Identifying Strongly Connected Components in Parallel,” International Parallel and Distributed Processing Symp. (IPDPS), Cancun, Mexico, May, 2000.
62. “Improving Performance of Matrix-Vector Multiplication,” Supercomputing 99, Portland, OR, November, 1999.
63. “Power Invariant Vector Sequence Compaction,” International Conf. on Computer Aided Design, San Jose, CA, November, 1998.
64. “An Effective Graph Model to Decompose Linear Programs for Parallel Solution,” PARA96, Workshop on Applied Parallel Computing in Industrial Problems and Optimization, Lyngby, Denmark, August, 1996.
65. “A New Genetic Algorithm for Hypergraph Partitioning,” Artificial Intelligence and Neural Network Symp., Istanbul, Turkey, June, 1996.
66. “Wide-Area Distributed Selective Dissemination of Information,” International Symp. on Computer and Information Systems, Izmir, Turkey, November, 1995.
67. “Decomposing Linear Programs for Parallel Solution,” Bilkent University, Dept. of Computer Science Seminar, Ankara, Turkey, December, 1995

LINKS

- Home Page: <http://www.sandia.gov/~apinar>
- Google Scholar Profile: <https://scholar.google.com/citations?user=UowcN18AAAAJ&hl=en>
- arXiv Publications https://arxiv.org/find/cs/1/au:+Pinar_A/0/1/0/all/0/1
- DBLP <http://dblp.uni-trier.de/pers/hd/p/Pinar:Ali>