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## EDUCATION

1989, Ph.D. in computer science from the University of Wisconsin-Madison. Advisor: Udi Manber.  
1984, B.S. in computer science and mathematics from Iowa State University

## RESEARCH INTERESTS

Over the last decade my main research emphasis has been on algorithmic problems related green/sustainable computing. But more broadly I'm interested in algorithms for online problems, resource management, scheduling, and fair allocation.

## APPOINTMENTS

2001 – : Professor of computer science, University of Pittsburgh  
1995 – 2001: Associate professor of computer science, University of Pittsburgh  
1989 – 1995: Assistant professor of computer science, University of Pittsburgh

## JOURNAL PUBLICATIONS

54. A. Antoniadis, N. Barcelo, M. Consuegra, P. Kling, M. Nugent, K. Pruhs, and M. Squizzato, "Efficient Computation of Optimal Energy and Fractional Weighted Flow Trade-off Schedules", *Algorithmica*, to appear.
53. J. Chen, K. Pruhs, and G.J. Woeginger, "The one-dimensional Euclidean domain: finitely many obstructions are not enough", *Social Choice and Welfare*, **48**(2), 409-432, 2017.
52. N. Bansal, and K. Pruhs, "Weighted geometric set multi-cover via quasi-uniform sampling," *Journal of Computational Geometry*, **7**(1), 221-236, 2016.
51. S. Im, B. Moseley, K. Pruhs, and E. Torng, "Competitively Scheduling Tasks with Intermediate Parallelizability", Special issue *ACM Transactions on Parallel Computing* devoted to selected papers from the 2014 Symposium on Parallelism in Algorithms and Architectures, **3**(1), 4:1-4:19, 2016.
50. S. Im, B. Moseley, K. Pruhs, "Online Scheduling with General Cost Functions", *SIAM Journal of Computing*, **43**(1), 126-143, 2014.
49. N. Bansal, K. Pruhs, "The Geometry of Scheduling", *SIAM Journal of Computing*, **43**(5), 1684-1698, 2014.

48. N. Bansal, H. Chan and K. Pruhs, “Speed Scaling with an Arbitrary Power Function”, *ACM Transactions on Algorithms*, **9**(2), 18, 2013.
47. L. Al Moakar, P. Chrysanthis, C. Chung, S. Guirguis, A. Labrinidis, P. Neophytou and K. Pruhs, “Auction-based Admission Control for Continuous Queries in a Multi-Tenant Data-Stream Management System”, *International Journal of Next-Generation Computing*, **3**(3), 2012.
46. D. Cole, S. Im, B. Moseley and K. Pruhs, “Speed scaling for stretch plus energy”, *Operations Research Letters*, **40**(3), 180-184, 2012.
45. J. Edmonds and K. Pruhs, “Scalably scheduling processes with arbitrary speedup curves”, *ACM Transactions on Algorithms*, **8**(3), 28, 2012.
44. N. Bansal, H. Chan, D. Katz and K. Pruhs, “Improved Bounds for Speed Scaling in Devices Obeying the Cube-Root Rule”, special issue of *Theory of Computing* in memory of Rajeev Motwani, **8**(1), 209-229, 2012.
43. C. Chung, K. Ligett, K. Pruhs, and A. Roth, “The Power of Fair Pricing Mechanisms”, special issue of *Algorithmica* devoted to selected papers from the 2010 Latin American Symposium on Theoretical Informatics, **63**(3), 634-644, 2012.
42. D. Cole, S. Im, B. Moseley, and K. Pruhs, “Speed scaling for stretch plus energy”, *Operations Research Letters*, **40**(3), 180-184, 2012.
41. J. Edmonds, and K. Pruhs, “ Cake cutting really is not a piece of cake”, *ACM Transactions on Algorithms*, **7**(4), 2011.
40. N. Bansal, H. Chan, and K. Pruhs, “Competitive Algorithms for Due Date Scheduling”, *Algorithmica*, **59**(4), 569-582, 2011.
39. N. Bansal, D. Bunde, H. Chan, and K. Pruhs, “ Average Rate Speed Scaling”, *Algorithmica*, **60**(4), 877-889, 2011.
38. H. Chan, J. Edmonds, T.W. Lam, L. Lee, A. Marchetti-Spaccamela, and K. Pruhs, “Non-clairvoyant Speed Scaling for Flow and Energy”, *Algorithmica*, **6**(3), 507-517, 2011.
37. H. Chan, J. Edmonds, and K. Pruhs, “Speed Scaling of Processes with Arbitrary Speedup Curves on a Multiprocessor”, special issue of *Theory Computing Systems* devoted to selected papers from the 2009 Symposium on Parallel Algorithms and Architectures, **49**(4), 817-833, 2011.
36. S. Baruah, and K. Pruhs, “Open problems in real-time scheduling”, *Journal of Scheduling*, **13**(6), 577-582, 2010.
35. N. Bansal, and K. Pruhs, “Server Scheduling to Balance Priorities, Fairness, and Average Quality of Service”, *SIAM Journal of Computing*, **39**(7), 3311-3335, 2010.
34. N. Bansal, K. Pruhs, and C. Stein, “Speed Scaling for Weighted Flow Time”, *SIAM Journal of Computing*, **39**(4), 1294-1308, 2009.
33. N. Bansal, H.L. Chan, and K. Pruhs, “Speed scaling with a solar cell”, a special issue of *Theoretical Computer Science* devoted to selected papers from the 2008 International Conference on Algorithmic Aspects in Information and Management, **410**(45), 4580-4587, 2009.

32. K. Pruhs, P. Uthaisombut, and G. Woeginger, “Getting the best response for your erg”, *ACM Transactions on Algorithms*, **4**(3), 2008.
31. K. Pruhs, R. van Stee, and P. Uthaisombut, “Speed Scaling of Tasks with Precedence Constraints”, special issue of *Theory of Computing Systems* devoted to selected papers from the 2005 Workshop on Approximation and Online Algorithms, **43**(1), 67-80, 2008.
30. M. Sharaf, P. Chrysanthis, A. Labrinidis, and K. Pruhs, “Algorithms and metrics for processing multiple heterogeneous continuous queries,” *ACM Transactions on Database Systems*, **33**(1), 1-44, 2008.
29. J. Beaver, K. Pruhs, P. Chrysanthis, and V. Liberatore, “Improving the Hybrid Data Dissemination Model of Web Documents”, *World Wide Web*, **11**(3), 313-337, 2008.
28. N. Bansal, T. Kimbrel, and K. Pruhs, “Speed scaling to manage energy and temperature”, *Journal of the ACM*, **54**(1), 2007.
27. K. Pruhs, and G.J. Woeginger, “Approximation schemes for a class of subset selection problems”, A special issue of *Theoretical Computer Science* devoted to selected papers from 2004 Conference on Latin American Theoretical Informatics, **382**(2), 151-156, 2007.
26. A. Al-Hammouri, W. Zhang, R. Buchheit, V. Liberatore, P. Chrysanthis, K.Pruhs, “Network awareness and application adaptability”, *Information Systems and E-Business Management*, **4**(4), 399-419, 2006.
25. L. Becchetti, S. Leonardi, A. Marchetti-Spaccamela, K. Pruhs, “Online weighted flow time and deadline scheduling”, *Journal of Discrete Algorithms* **4**(3), 339-352, 2006.
24. J. Edmonds, K Pruhs, “A maiden analysis of longest wait first”, *ACM Transactions on Algorithms*, **1**(1), 14-32, 2005.
23. K. Pruhs, P. Uthaisombut, “A comparison of multicast pull models”, A special issue of *Algorithmica* devoted to selected papers from the 2002 European Symposium on Algorithms, **42**(3-4), 289-307, 2005.
22. B. Kalyanasundaram, and K. Pruhs, “Fault-tolerant scheduling”, *SIAM Journal of Computing*. **34**(3), 697-719, 2005.
21. L. Becchetti, S. Leonardi, A. Marchetti-Spaccamela, K. Pruhs, “Semi-clairvoyant scheduling”, special issue of *Theoretical Computer Science* in memory of Steve Seiden, **324**(2-3), 325-335, 2004.
20. J. Edmonds, and K. Pruhs, “Multicast pull scheduling: when fairness is fine”, special issue of *Algorithmica* devoted to online algorithms, **36**(3), 315 – 330, 2003.
19. B. Kalyanasundaram, and K. Pruhs, “Minimizing flow time nonclairvoyantly”, *Journal of the ACM*, **50**(4), 551 – 567, 2003.
18. B. Kalyanasundaram, and K. Pruhs, “Maximizing job completions online”, special issue of *Journal of Algorithms* devoted to selected papers from the 1998 European Symposium on Algorithms, **49**(1), 63-85, 2003.
17. B. Kalyanasundaram, J. Noga, K. Pruhs and G. Woeginger, “Caching for web searching”, special issue of *Algorithmica* devoted to Internet algorithmics, **33**(3), 353–370, 2002.

16. B. Kalyanasundaram, K. Pruhs, and M. Velauthapillai, “Scheduling broadcasts in wireless networks”, special issue of *Journal of Scheduling* devoted to selected papers from the 2000 European Symposium on Algorithms, **4**(6), 339 – 354, 2001.
15. B. Kalyanasundaram, and K. Pruhs, “Eliminating migration in multi-processor scheduling”, special issue of *Journal of Algorithms* devoted to selected papers from the 1999 ACM/SIAM Symposium on Discrete Algorithms (SODA), **38**(1), 2 – 24, 2001.
14. B. Kalyanasundaram, and K. Pruhs, “Dynamic spectrum allocation: the impotency of duration notification”, special issue of *Journal of Scheduling* devoted to approximation algorithms, **3**(5), 289 – 296, 2000.
13. B. Kalyanasundaram, K. Pruhs, and E. Torng, “ Errata: A new algorithm for scheduling periodic, real-time tasks”, *Algorithmica*, **28**(3), 269 – 270, 2000.
12. B. Kalyanasundaram, and K. Pruhs, “Fault-tolerant real-time scheduling”, special issue of *Algorithmica* devoted to selected papers from the 1997 European Symposium on Algorithms (ESA), **28**(1), 125 – 144, 2000.
11. B. Kalyanasundaram, and K. Pruhs, “An optimal deterministic algorithm for online b-matching”, *Theoretical Computer Science*, **233**(1), 319 – 325, 2000.
10. B. Kalyanasundaram, and K. Pruhs, “Speed is as powerful as clairvoyance”, *Journal of the ACM*, **47**(4), 617 – 643, 2000.
9. B. Kalyanasundaram, and K. Pruhs, “The online transportation problem”, *SIAM Journal of Discrete Mathematics*, **13**(3), 370 – 383, 2000.
8. Y. Azar, B.Kalyanasundaram, S. Plotkin, K. Pruhs, and O. Waarts, “Online load balancing of temporary tasks”, *Journal of Algorithms*, **22**(1), 93 – 110, 1997.
7. K. Pruhs, “On the number of local adaptations to transform a spanning tree”, *Discrete Applied Mathematics*, **57**(1), 67 – 74, 1995.
6. K. Pruhs, “Average case scalable on-line algorithms for fault replacement”, *Information Processing Letters*, **52**(3), 131 – 136, 1995.
5. B. Kalyanasundaram, and K. Pruhs, “Not all insertion methods yield constant approximate tours in the plane”, *Theoretical Computer Science*, **125**(2), 345 – 353, 1994.
4. B. Kalyanasundaram, and K. Pruhs, “Constructing competitive tours from local information”, special issue of *Theoretical Computer Science* on dynamic and on-line algorithms, **130**(1), 125 – 138, 1994.
3. B. Kalyanasundaram, and K. Pruhs, “A competitive analysis of algorithms for searching unknown scenes”, *Computational Geometry: Theory and Applications*, **3**, 139 – 155, 1993.
2. B. Kalyanasundaram, and K. Pruhs, “Online weighted matching”, *Journal of Algorithms*, **14**(3), 478 – 488, 1993.
1. K. Pruhs, and U. Manber, “The complexity of controlled selection,” *Information and Computation*, **91**(1), 103 – 127, 1991.

## CONFERENCE PUBLICATIONS

98. N. Barcelono, P. Kling, M. Nugent, and K. Pruhs, “Optimal Speed Scaling with a Solar Cell”, International Conference on Combinatorial Optimization and Applications (COCOA), 521-535, 2016.
97. A. Antoniadis, N. Barcelo, M. Nugent, K. Pruhs, K. Schewior, and M. Scquizzato, “Chasing Convex Bodies and Functions”, Latin American Symposium on Theoretical Informatics (LATIN), 68-81, 2016.
96. N. Barcelo, M. Nugent, K. Pruhs, and M. Scquizzato, “The power of heterogeneity in Near-Threshold Computing”, International Green and Sustainable Computing Conference (IGSC), 2015.
95. N. Barcelo, P. Kling, M. Nugent, K. Pruhs, and M. Scquizzato, “On the Complexity of Speed Scaling”, International Symposium on Mathematical Foundations of Computer Science (MFCS), 75-89, 2015.
94. N. Barcelo, M. Nugent, K. Pruhs, and M. Scquizzato, “Almost All Functions Require Exponential Energy”, International Symposium on Mathematical Foundations of Computer Science (MFCS), 90-101, 2015.
93. S. Im, B. Moseley, and K. Pruhs, “Stochastic Scheduling of Heavy-tailed Jobs”, International Symposium on Theoretical Aspects of Computer Science (STACS), 474-486, 2015.
92. N. Bansal, M. Elis, L. Jez, G. Koumoutsos, and K. Pruhs, “Tight Bounds for Double Coverage Against Weak Adversaries”, International Workshop on Approximation and Online Algorithms (WAOA), 47-58, 2015.
91. S. Im, J. Kulkarni, K. Munagala, and K. Pruhs, “SelfishMigrate: A Scalable Algorithm for Non-clairvoyantly Scheduling Heterogeneous Processors”, Symposium on Foundations of Computer Science (FOCS), 531-540, 2014.
90. A. Antoniadis, N. Barcelo, M. Nugent, K. Pruhs, and M. Scquizzato, “Complexity-theoretic obstacles to achieving energy savings with near-threshold computing”, International Green Computing Conference (IGCC), 1-8, 2014.
89. A. Antoniadis, N. Barcelo, M. Nugent, K. Pruhs, and M. Scquizzato, “A  $o(n)$ -Competitive Deterministic Algorithm for Online Matching on a Line”, International Workshop on Approximation and Online Algorithms (WAOA), 11-22, 2014.
88. A. Antoniadis, N. Barcelo, M. Consuegra, P. Kling, M. Nugent, K. Pruhs, and M. Scquizzato, “Efficient Computation of Optimal Energy and Fractional Weighted Flow Trade-off Schedules”, Symposium on Theoretical Aspects of Computer Science (STACS), 63-74, 2014.
87. R. Krishnaswamy, V. Nagarajan, K. Pruhs, and C. Stein, “Cluster Before You Hallucinate: Approximating Node-Capacitated Network Design and Energy Efficient Routing”, ACM Symposium on Theory of Computing (STOC), 734-743, 2014.
86. A. Antoniadis, N. Barcelo, D. Cole, K. Fox, B. Moseley, M. Nugent, and K. Pruhs, “Packet Forwarding Algorithms in a Line Network”, Latin American Symposium on Theoretical Informatics (LATIN), 610-621, 2014.

85. A. Antoniadis, N. Barcelo, M. Nugent, K. Pruhs and M. Scquizzato, “Energy-Efficient Circuit Design”, Innovations in Theoretical Computer Science Conference (ITCS), 303-312, 2014.
84. S. Im, B. Moseley, K. Pruhs, and E. Torng, “Competitively scheduling tasks with intermediate parallelizability”, ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 22-29, 2014. Invited to appear in a special issue of *ACM Transactions on Parallel Computing* devoted to selected papers from the conference.
83. A. Antoniadis, S. Im, R. Krishnaswamy, B. Moseley, V. Nagarajan, K. Pruhs, and C. Stein, “Hallucination Helps: Energy Efficient Virtual Circuit Routing”, in ACM-SIAM Symposium on Discrete Algorithms (SODA), 1141-1153, 2014.
82. B. Moseley, K. Pruhs and C. Stein, “The Complexity of Scheduling for p-Norms of Flow and Stretch”, International Conference on Integer Programming and Combinatorial Optimization (IPCO), 278-289, 2013.
81. N. Bansal, and K. Pruhs, “Weighted Geometric Set Multi-cover via Quasi-uniform Sampling”, European Symposium on Algorithms (ESA), 145-156, 2012.
80. K. Pruhs and G. Woeginger, “Divorcing Made Easy”, International Conference on Fun with Algorithms (FUN), 305-314, 2012.
79. D. Cole, D. Letsios, M. Nugent, and Kirk Pruhs, “Optimal energy trade-off schedules”, International Green Computing Conference (IGCC), 1-10, 2012.
78. N. Bansal, A. Gupta, R. Krishnaswamy, V. Nagarajan, K. Pruhs and C. Stein, “Multicast Routing for Energy Minimization Using Speed Scaling”, Mediterranean Conference on Algorithms (MedAlg), 37-51, 2012.
77. N. Barcelo, M. Zhou, D. Cole, M. Nugent and K. Pruhs, “Energy Efficient Caching for Phase-Change Memory”, Mediterranean Conference on Algorithms (MedAlg), 67-81, 2012.  
N. Barcelo, S. Im, B. Moseley and K. Pruhs, “Shortest-Elapsed-Time-First on a Multiprocessor”, Mediterranean Conference on Algorithms (MedAlg), 82-92, 2012.
76. A. Gupta, S. Im, R. Krishnaswamy, B. Moseley and K. Pruhs, “Scheduling heterogeneous processors isn’t as easy as you think”, ACM-SIAM Symposium on Discrete Algorithms (SODA), 1242-1253, 2012.
75. S. Im, B. Moseley and K. Pruhs, “Online scheduling with general cost functions”, ACM-SIAM Symposium on Discrete Algorithms (SODA), 1254-1265, 2012.
74. A. Gupta, R. Krishnaswamy and K. Pruhs, “Online Primal-Dual for Non-linear Optimization with Applications to Speed Scaling”, Workshop on Approximation and Online Algorithms (WAOA), 173-186, 2012.
73. L. Atkins, G. Aupy, D. Cole and K. Pruhs,, “ Speed Scaling to Manage Temperature”, International Conference on Theory and Practice of Algorithms in (Computer) Systems (TAPAS), 9-20, 2011.
72. K. Pruhs and C. Stein, “How to Schedule When You Have to Buy Your Energy,, International Workshop on Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX), 352-365, 2010.

71. N. Bansal and K. Pruhs, “The Geometry of Scheduling”, IEEE Symposium on Foundations of Compute Science (FOCS), 407-414, 2010.
70. Kirk Pruhs, Julien Robert and Nicolas Schabanel, “Minimizing Maximum Flowtime of Jobs with Arbitrary Parallelizability”, Workshop on Approximation and Online Algorithms (WAOA), 237-248, 2010.
69. A. Gupta, R. Krishnaswamy and K. Pruhs, Nonclairvoyantly Scheduling Power-Heterogeneous Processors, International Green Computing Conference (IGCC), 165-173, 2010.
68. A. Gupta, R. Krishnaswamy and K. Pruhs, “Scalably Scheduling Power-Heterogeneous Processors”, International Colloquium on Automata Languages and Programming, Track A (ICALP), 312-323, 2010.
67. A. Gupta, S. Im, R. Krishnaswamy, B. Moseley, and K. Pruhs, “Scheduling Jobs with Varying Parallelizability to Reduce Variance”, Symposium on Parallel Algorithms and Architectures (SPAA), 11-20, 2010.
66. L. Al Moakar, P. Chrysanthis, C. Chung, S. Guirguis, A. Labrinidis, P. Neophytou, and K. Pruhs, “Admission control mechanisms for continuous queries in the cloud”, International Conference on Data Engineering (ICDE), 409-412, 2010.
65. C. Chung, K. Ligett, K. Pruhs, and A. Roth, “The Power of Fair Pricing Mechanisms”, Latin American Symposium on Theoretical Informatics (LATIN), 554-564, 2010. Invited to special issue of *Algorithmica* devoted to selected papers from the conference.
64. N. Bansal, H.L. Chan, D. Katz, and K. Pruhs, “Improved Bounds for Speed Scaling in Devices Obeying the Cube-Root Rule”, International Colloquium on Automata Languages and Programming, Track A (ICALP), 144-155, 2009.
63. S. Guirguis, M. Sharaf, P. Chrysanthis, A. Labrinidis, and K. Pruhs, “Adaptive Scheduling of Web Transactions”, International Conference on Data Engineering (ICDE), 357-368, 2009.
62. J. Edmonds, and K. Pruhs, “Scalably scheduling processes with arbitrary speedup curves”, ACM-SIAM Symposium on Discrete Algorithms (SODA), 685-692, 2009.
61. N. Bansal, H.L. Chan, and K. Pruhs, “Speed scaling with an arbitrary power function”, ACM-SIAM Symposium on Discrete Algorithms (SODA), 693-701, 2009.
60. H.L. Chan, J. Edmonds, and K. Pruhs, “Speed scaling of processes with arbitrary speedup curves on a multiprocessor”, Symposium on Algorithms and Architecture (SPAA), 1-10, 2009. Invited to appear in a special issue of *Theory Computing Systems* devoted to selected papers from the conference.
59. H.L. Chan, J. Edmonds, T.W. Lam, L.K. Lee, A. Marchetti-Spaccamela, and K. Pruhs, “Nonclairvoyant Speed Scaling for Flow and Energy”, Symposium on Theoretical Aspects of Computer Science (STACS), 255-264, 2009.
58. N. Bansal, H. Chan, and K. Pruhs, “Speed Scaling with a Solar Cell”, Conference on Algorithmic Aspects in Information and Management (AAIM), 2008.
57. J. Edmonds, K. Pruhs, and J. Solanki, “Confidently Cutting a Cake into Approximately Fair Pieces”, Conference on Algorithmic Aspects in Information and Management (AAIM), 2008.

56. C. Chung, K. Ligett, K. Pruhs, and A. Roth, “The Price of Stochastic Anarchy”, Symposium on Algorithmic Game Theory (SAGT), 303-314, 2008.
55. N. Bansal, D. Bunde, H. Chan and K. Pruhs, “Average Rate Speed Scaling”, Latin American Theoretical Informatics Symposium (LATIN), 2008.
54. C. Chung, K. Pruhs, and P. Uthaisombut, “The Online Transportation Problem: On the Exponential Boost of One Extra Server”, Latin American Theoretical Informatics Symposium (LATIN), 2008.
53. W. Zhang, V. Liberatore, J. Beaver, P. Chrysanthis, and K. Pruhs, “Scalable data dissemination using hybrid methods”, IEEE International Symposium on Parallel and Distributed Processing, 1-12, 2008.
52. M. Sharaf, S. Guirguis, A. Labrinidis, K. Pruhs, and P. Chrysanthis, “ASETS: A self-managing transaction scheduler”, International Conference on Data Engineering Workshops, 56-62, 2008.
51. N. Bansal, H. Chan, R. Khandekar, K. Pruhs, B. Schieber and C. Stein, “Non-Preemptive Min-Sum Scheduling with Resource Augmentation”, IEEE Symposium on Foundations of Computer Science (FOCS), 2007.
50. N. Bansal, H. Chan, and K. Pruhs, “Competitive Algorithms for Due Date Scheduling”, International Conference on Automata, Language and Programming (ICALP), 2007.
49. N. Bansal, C. Stein, K. Pruhs, “Speed Scaling for Weighted Flow Time”, ACM/SIAM Symposium on Discrete Algorithms (SODA), 2007.
48. M. Aly, K. Pruhs, P. Chrysanthis, “KDDCS: a load-balanced in-network data-centric storage scheme for sensor networks”, ACM International Conference on Information and Knowledge Management (CIKM), 317-326, 2006.
47. D. Mosse, L. Comfort, A. Amer, J. Brustoloni, P. Chrysanthis, M. Hauskrecht, A. Labrinidis, R. Melhem, K. Pruhs, “Secure-CITI Critical Information-Technology Infrastructure”, International Conference on Digital Government Research, 253-254, 2006,
46. J. Edmonds, K. Pruhs, “Balanced Allocations of Cake”, IEEE Symposium on Foundations of Computer Science (FOCS), 623-634, 2006.
45. J. Beaver, P. Chrysanthis, K. Pruhs, V. Liberatore, “To Broadcast Push or Not and What?” International Conference on Mobile Data Management (MDM), 2006.
44. M. Sharaf, P. Chrysanthis, A. Labrinidis, K. Pruhs, “Efficient Scheduling of Heterogeneous Continuous Queries”, International Conference on Very Large Data Bases (VLDB), 511-522, 2006.
43. M. Aly, P. Chrysanthis, K. Pruhs, “Decomposing Data-Centric Storage Query Hot-spots in Sensor Networks”, International Conference on Mobile and Ubiquitous Systems: Networks and Services (MOBIQUITOUS), 2006.
42. J. Edmonds and K. Pruhs “Cake cutting isn’t a piece of cake”, ACM/SIAM Symposium on Discrete Algorithms (SODA), 2006.



41. N. Bansal, and K. Pruhs, “Speed scaling to manage temperature”, Symposium on Theoretical Aspects of Computer Science (STACS), 460-471, 2005.
40. M. Sharaf, A. Labrinidis, P. Chrysanthis, K. Pruhs, “Freshness-aware scheduling of continuous queries in the dynamic web”, Workshop on the Web and Databases (WebDB), 73-78, 2005.
39. K. Pruhs, R. van Stee, P. Uthaisombut, “Speed Scaling of Tasks with Precedence Constraints”, Workshop on Approximation and Online Algorithms (WAOA), 307-319, 2005. Invited to special issue of *Theory of Computing Systems* of selected papers from the conference.
38. M. Aly, Kirk Pruhs, T. Znati, B. Hunsaker, “On the Coverage Problem for Myopic Sensors” IEEE International Conference on Wireless Networks, Communications, and Mobile Computing (WIRELESSCOM), 2005.
37. M. Aly, N. Morsillo, P. Chrysanthis, and K. Pruhs, “Zone Sharing: A Hot-Spots Decomposition Scheme for Data-Centric Storage in Sensor Networks”, International VLDB Workshop on Data Management for Sensor Networks (DMSN), 2005.
36. N. Bansal, T. Kimbrel, and K. Pruhs, “Dynamic speed scaling to manage energy and temperature”, IEEE Symposium on Foundations of Computer Science (FOCS), 520-529, 2004.
35. J. Beaver, K. Pruhs, P. Chrysanthis, and V. Liberatore, “The multicast pull advantage in dissemination-based data delivery”, Hellenic Symposium on Data Management, 2004.
34. K. Pruhs, P. Uthaisombut, G. Woeginger, “Getting the best response for your erg”, Scandinavian Workshop on Algorithm Theory (SWAT), 14-25, 2004.
33. J. Kohrt, and K. Pruhs, “A constant approximation algorithm for sorting buffers”, Latin American Theoretical Informatics (LATIN), 2004.
32. K. Pruhs, and G. Woeginger, “Approximation schemes for a class of subset selection problems”, Latin American Theoretical Informatics (LATIN), 2004. Invited to a special issue of *Theoretical Computer Science* of selected papers from the conference.
31. N. Bansal, and K. Pruhs, “Server scheduling in the weighted  $l_p$  norm”, Latin American Theoretical Informatics (LATIN), 2004.
30. J. Edmonds, and K. Pruhs, “A maiden analysis of Longest Wait First”, ACM/SIAM Symposium on Discrete Algorithms (SODA), 2004.
29. J. Beaver, N. Morsillo, K. Pruhs, P. Chrysanthis, and V. Liberatore, “Scalable dissemination: What’s hot and what’s not”, Workshop on the Web and Databases (WebDB), 2004.
28. N. Bansal and K. Pruhs, “Server scheduling in the  $L_p$  norm: A rising tide lifts all boats”, ACM Symposium on Theory of Computing (STOC), 2003.
27. J. Beaver, W. Li, V. Penkrot, S. Roychowdhury, M. Sharaf, W. Zhang, P. Chrysanthis, K. Pruhs, and V. Liberatore, “An optimized multicast based data dissemination middleware: a demonstration”, IEEE International Conference on Data Engineering (ICDE) 2003.
26. P. Chrysanthis, K. Pruhs, and V. Liberatore, “Middleware support for multicast-based data dissemination: a working reality”, IEEE Workshop on Reliable Dependable Systems (WORDS), 2003.

25. L. Becchetti, S. Leonardi, A. Marchetti-Spaccamella, and K. Pruhs, “Semi-Clairvoyant Scheduling”, European Symposium on Algorithms (ESA), 2003.
24. K. Pruhs and P. Uthaisombut “A comparison of multicast pull models”, European Symposium on Algorithms (ESA), 2002.
23. E. Wiewiora and K. Pruhs “Evaluating the Local Ratio Algorithm for Dynamic Storage Allocation”, Workshop on Algorithms Engineering and Experiments (ALENEX), 2002.
22. J. Edmonds, and K. Pruhs “Broadcast scheduling: when fairness is fine”, *ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 2002.
21. A. Berfield, B. Simmons, P. Chrysanthis, and K. Pruhs “Better client OFF time predictions using machine learning techniques”, International Workshop on Web and Data Management (WIDM), 2001.
20. Luca Becchetti, Stefano Leonardi, Alberto Marchetti-Spaccamella, Kirk Pruhs, “Online weighted flow time and deadline scheduling”, Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2001.
19. B. Kalyanasundaram, K. Pruhs, and M. Velauthapillai, “Scheduling broadcasts in wireless networks”, *European Symposium on Algorithms (ESA)*, 2000. Invited to submit to a special issue of *Journal of Scheduling* devoted to selected papers from ESA 2000.
18. B. Kalyanasundaram, J. Noga, K. Pruhs and G. Woeginger, “Caching for web searching”, *Scandinavian Workshop on Algorithms and Theory (SWAT)*, 2000. Invited to submit to a special issue of *Nordic Journal of Computing* devoted to selected papers from SWAT 2000.
17. B. Kalyanasundaram, and K. Pruhs, “Dynamic spectrum allocation: the impotency of duration notification”, *Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 2000.
16. B. Kalyanasundaram, and K. Pruhs, “Eliminating migration in multi-processor scheduling”, *ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 1999. Invited to appear in a special issue of *Journal of Algorithms* devoted to selected papers from the 1999 SODA.
15. B. Kalyanasundaram, and K. Pruhs, “Maximizing job completions online”, *European Symposium on Algorithms (ESA)*, 1998. Invited to appear in a special issue of *Journal of Algorithms* devoted to selected papers from the 1998 ESA.
14. B. Kalyanasundaram, and K. Pruhs, “Minimizing flow time nonclairvoyantly”, *IEEE Symposium on Foundations of Computer Science (FOCS)*, 1997.
13. B. Kalyanasundaram, and K. Pruhs, “Fault-tolerant real-time scheduling”, *European Symposium on Algorithms (ESA)*, 1997. Invited to appear in a special issue of *Algorithmica* devoted to selected papers from the 1997 ESA.
12. B. Kalyanasundaram, and K. Pruhs, “An optimal deterministic algorithm for online b-matching”, *Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 1996.
11. B. Kalyanasundaram, and K. Pruhs, “Speed is as powerful as clairvoyance”, *IEEE Symposium on Foundations of Computer Science (FOCS)*, 1995.

10. B. Kalyanasundaram, and K. Pruhs, “The online transportation problem”, *European Symposium on Algorithms (ESA)*, 1995.
9. B. Kalyanasundaram, and K. Pruhs, “Fault-tolerant scheduling”, *ACM Symposium on Theory of Computing (STOC)*, 1994.
8. Y. Azar, B. Kalyanasundaram, S. Plotkin, K. Pruhs, and O. Waarts, “Online load balancing of temporary tasks”, *Workshop on Algorithms and Data Structures (WADS)*, 1993.
7. B. Kalyanasundaram, and K. Pruhs, “Constructing competitive tours from local information”, *EATCS International Colloquium on Automata, Languages, and Programming (ICALP)*, 1993. Invited to submit to a special issue of the *Nordic Journal of Computing* devoted to selected papers from ICALP 1993.
6. B. Kalyanasundaram, and K. Pruhs, “A competitive analysis of algorithms for searching unknown scenes”, *Symposium on Theoretical Aspects of Computer Science (STACS)*, 1992.
5. B. Kalyanasundaram, and K. Pruhs, “Online weighted matching”, *ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 1991.
4. R. Melhem, K. Pruhs, and T. Znati, “Using spanning trees for balancing dynamic load on multiprocessors”, *Distributed Memory Computing Conference*, 1991.
3. T. Znati, R. Melhem, and K. Pruhs “Dilation based bidding schemes for dynamic load balancing on distributed processing systems”, *Distributed Memory Computing Conference*, 1991.
2. K. Pruhs, and U. Manber, “The complexity of controlled selection,” *EATCS International Colloquium on Automata Languages and Programming (ICALP)*, 1989.
1. K. Pruhs, “The computational complexity of some rounding and survey overlap problems,” *Meeting of the Survey Research Methods Section of the American Statistical Association*, 1989.

## SELECTED OTHER PUBLICATIONS

14. Sungjin Im, Benjamin Moseley, Kirk Pruhs, “ A tutorial on amortized local competitiveness in online scheduling”, *SIGACT News*, **42**(2), 83-97, 2011.
13. Kirk Pruhs: “ Review of Algorithmic Game Theory (Editors: Noam Nisan, Tim Roughgarden, va Tardos and Vijay V. Vazirani”, *Operations Research Letters*, **36**(5), page 656, 2008.
12. Luca Becchetti, Stefano Leonardi, Alberto Marchetti-Spaccamela, Kirk Pruhs: Flow Time Minimization. *Encyclopedia of Algorithms*, 2008.
11. Kirk Pruhs: Speed Scaling. *Encyclopedia of Algorithms*, 2008.
10. K. Pruhs, “Competitive online scheduling for server systems”, *SIGMETRICS Performance Evaluation Review*, **34**(4), 52-58, 2007.
9. Sandy Irani, Kirk Pruhs, “Algorithmic problems in power management”, *SIGACT News* **36**(2), 63-76, 2005.
8. K. Pruhs, J. Sgall, and E. Torng, “Online Scheduling”, *Handbook of Scheduling: Algorithms, Models and Performance Analysis*, editor J. Leung, 2004.

7. P. Chrysanthis, V. Liberatore, and K. Pruhs, “Middleware for scalable data dissemination”, *Middleware for Communications*, editor Q. H. Mahmoud, 2004.
6. K. Pruhs and B. Kalyanasundaram, “Online network optimization problems”, *Online Algorithms: The State of the Art*, Editors: Amos Fiat and Gerhard Woeginger, Springer-Verlag, 1998.
5. K. Pruhs, “How to design dynamic programming algorithms sans recursion”, *SIGACT News*, **29**(1), 32 - 35, March 1998.
4. K. Pruhs, T. Znati, and R. Melhem, “Dynamic mapping of adaptive computations onto linear arrays”, *Unstructured Scientific Computations on Scalable Multiprocessors*, Editors: P. Mehrotra, J. Saltz, and R. Voigt, MIT Press, 1991.
3. B. Kalyanasundaram, and K. Pruhs, “On-line weighted matching”, *On-Line Algorithms*, Editors: L. McGeoch, and D. Sleator, ACM/AMS, 1991.
2. B. Kalyanasundaram and K. Pruhs, “Visual searching and mapping”, *On-Line Algorithms*, Editors: L. McGeoch, and D. Sleator, ACM/AMS, 1991.
1. K. Pruhs, “The SPIN-OUT Puzzle”, *Bulletin of the ACM Special Interest Group on Computer Science Education*, **25**(3), 36 – 38, 1993.

## FUNDING

16. “AitF: EXPL: Data Management in Domain Wall Memory-based Scratchpad for High Performance Mobile Devices” National Science Foundation award number CCF-1535755, August 2015 to August 2018, \$400,000. Joint with Youtao Zhang.
15. “AF: Small: Algorithmic Energy Management in New Information Technologies”, NSF award number CCF1421508, June 2014 to June 2017, \$400,000. Solo grant.
14. “EAGER: A Framework for joint optimization of power management and performance in virtualized, heterogeneous cloud computing environments”, National Science Foundation award number CNS-1253218, August 2012 to August 2014, \$188,000. Joint with Taieb Znati.
13. “AF: Small: Green Computing Algorithmics”, National Science Foundation Award Number CCF-1115575 from Algorithmic Foundations Program, September 2011 to September 2014, \$350,000. Solo grant.
12. “Science of Power Management”, National Science Foundation award CNS-0936386 from Computer and Network Systems division, April 2009 to March 2011, \$70,000. To support an NSF visioning workshop I co-organized.
11. “Algorithmic Support for Power Management” National Science Foundation award CCF-0830558 from Algorithmic Foundations Program, August 2008 to August 2011, \$300,000. Solo grant.
10. “Algorithms and Metrics for New Generation Data Stream Management Systems”, National Science Foundation award IIS-0534531 from Data Management Systems Program, September 2006 to September 2009. Joint with Panos Chrysanthis and Alex Labrinidis. \$516,000.

9. “Algorithmic support for power aware computing and communication”, National Science Foundation award CCF-0514058 from the Computer and Communication Foundations Program. July 2005 to July 2008. Solo grant. \$150,000.
8. “Algorithmic support for temperature aware computing and networking”, National Science Foundation award CCF-0448196 from the Computer and Communication Foundations Program. August 2004 to August 2005. \$100,000. Solo grant.
7. “ITR: Secure CITI: A Secure Critical Information Technology Infrastructure for Disaster Management”, National Science Foundation award CNS- 0325353 from the ITR medium program, September 2003 to September 2008. \$2,806,000. Joint with 8 other faculty.
6. “Middleware support for multicast data dissemination”, National Science Foundation award ANIR-0123705 from the Network Centric Middleware Services Program, October 2001 to October 2004. \$555,000. Joint with Panos Chrysanthis.
5. “Dynamic spectrum allocation algorithms”, United States Air Force, October 2001 to October 2002. \$100,000. Joint with Bala Kalyanasundaram.
4. “Algorithmic problems in next generation networks”, National Science Foundation award CCR-0098752 from the Theory of Computing Program, July 2001 to July 2004. \$240,000. Solo grant.
3. “Dynamic storage allocation”, United States Air Force, December 1999 to December 2000. \$100,000. Joint with Bala Kalyanasundaram.
2. “Scheduling protocols for networked multi-media applications”, National Science Foundation award CCR-9734927 from the Theory of Computing Program, June 1998 to June 2001. Joint with Bala Kalyanasundaram. \$206,000.
1. “Online network optimization”, National Science Foundation Research Initiation Award CCR-9209283 from the Theory of Computing Program, June 1992 to June 1995. Solo grant. \$72,000.

## **EDUCATIONAL GRANTS AND AWARDS**

- Several “student choice” teaching awards for graduate algorithms.
- Innovation in Teaching Award from the University of Pittsburgh Advisory Council on Instructional Excellence, 2000.
- Several NSF Research Experiences for Undergraduates (REU) Supplements.

## **POST-DOCS SUPERVISED**

- Ilan Cohen, 2017.
- Peter Kling, 2014. Next position: post-doc at Simon Fraser University.
- Michele Squizzato, 2014. Next position: post-doc at University of Houston.
- Antonios Antoniadis, 2013. Next position: post-doc at Max Planck Institute in Saarbrucken.
- Ho-Leung Chan, 2007-2008. Next position: Assistant professor University of Hong Kong

## Ph.D. STUDENTS SUPERVISED

- Max Bender. First year Ph.D. student.
- Neal Barcelo, graduated 2016. First position: McKinsey Consulting.
- Michael Nugent, graduated 2016. First position: Local Industry.
- Daniel Cole, graduated 2013. First position: Local Industry.
- Christine Chung, graduated 2009. First position: Jean C. Tempel Assistant Professor of Computer Science at Connecticut College.
- Mohamed Aly, graduated 2009. (Co-supervised with Panos Chrysanthis). First position: Yahoo Research.
- Jonathan Beaver, graduated 2005. (Co-supervised with Panos Chrysanthis). First position: Local Industry.

## PROFESSIONAL ACTIVITIES

- Associate Editor:
  - *ACM Transactions on Algorithms*, 2007-2016.
  - *INFORMS Journal of Computing*.
  - *Journal of Scheduling*.
  - *Encyclopedia of Algorithms*, first edition.
  - *Sustainable Computing: Informatics and Systems*, 2011-2013.
- Selected Program Committees
  - ACM/SIAM Symposium on Discrete Algorithms (SODA): 2001, 2005, 2010, 2013.
  - Conference on Algorithm Engineering and Experience (ALENEX): 2015
  - European Symposium on Algorithms (ESA): 2005, 2007, 2014, 2017.
  - Symposium on Parallelism in Algorithms and Architectures (SPAA): 2009, 2016.
  - International Conference on Green Computing (IGCC): 2010, 2011, 2012, 2013, 2014, 2016, 2017.
  - Workshop on Approximation and Online Algorithms (WAOA): 2005, 2007, 2012, 2013.
- Guest Editor:
  - Special issue of *Theory of Computing Systems* devoted to selected papers from the 2013 Workshop on Approximation and Online Algorithms.
  - Special issue of *Journal of Scheduling* devoted to selected papers from the 2007 Workshop on Models and Algorithms for Planning and Scheduling.
  - Special issue of *Journal of Scheduling* devoted to selected papers from the 2002 ACM/SIAM Symposium on Discrete Algorithms (SODA).

- Special issue of *Journal of Scheduling* devoted to selected papers from the 2001 Phillips Workshop on Scheduling and Resource Management (SCHARM)
  - Two special issues of *Journal of Scheduling* devoted to online scheduling
  - Special issue of *Journal of Algorithms* devoted selected papers from the 2001 ACM/SIAM Symposium on Discrete Algorithms (SODA)
  - Special issue of *Journal of Scheduling* devoted to papers from the 1999 Phillips Workshop on Scheduling and Resource Management (SCHARM)
- Program Committee Chair:
    - 2017 European Symposium on Algorithms (ESA), track B on algorithms engineering and applications.
    - 2013 Workshop on Approximation and Online Algorithms (WAOA), with Christos Kalamanis.
    - 2007 Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP)
- Organizer:
    - 2013 Dagstuhl Seminar on Scheduling, with Susanne Albers and Onno Boxma.
    - 2012 Symposium on Theory of Computing (STOC) Workshop on Computational Sustainability, with David Shmoys and Steven Phillips.
    - 2010 Dagstuhl Seminar on Scheduling, with Rolf Mohring and Sanjoy Baruah.
    - 2010 Second NSF Workshop on the Science of Power Management, with Cliff Stein.
    - 2009 NSF Workshop on the Science of Power Management, with Kirk Cameron.
    - 2008 Dagstuhl Workshop on Scheduling, with Rolf Mohring and Jane Liu.
    - 2007 Dagstuhl Workshop on Fair Division, with Steven Brams and Gerhard Woeginger.
    - 2006 Cluster on Online Optimization at International Symposium on Mathematical Programming (ISMP)
    - 2004 Bertinoro Workshop on Models and Algorithms for Information Networks, with Stefano Leonardi.
- Invite Speaker Gigs:
    - 2017 Networks Scientific Conference.
    - 2017 Workshop on Approximation and Online Algorithms (WAOA).
    - 2015 Scheduling Under Uncertainty Workshop.
    - 2015 Max Planck Advanced Course on the Foundations of Computer Science (ADFOCS).
    - 2012 Latin American Symposium on Theoretical Informatics (LATIN).
    - 2011 International Conference on Theory and Practice of Algorithms in (Computer) Systems (TAPAS).
    - 2011 IEEE Symposium on Foundations of Computer Science (FOCS).
    - 2009 Inaugural Workshop for the Microsoft-CNRS Chair on Optimization and Sustainable Development at Ecole Polytechnique in Paris.
    - 2006 New Horizons in Computing School on Discrete Algorithms in Japan.

- 2004 Conference on the Mathematics of Operations Research in the Netherlands.
- Current Steering Committees:
  - European Symposium on Algorithms.
  - Latin American Symposium on Theoretical Informatics.
  - Workshop on Models and Algorithms for Planning and Scheduling Problems (Chair).
- Referee: Many journals and conferences
- Panel Member: Many NSF Panels, primarily in Algorithmic Foundations.
- Chair of undergraduate program committee in the Computer Science Department since 1995.
- Director of the undergraduate program in Bioinformatics since 2007.