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Purdue University
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Education

1976	M.A.	Institute of Telecommunications, Technical University of Gdansk.
1980	Ph.D.	Institute of Telecommunications, Technical University of Gdansk.

Employment

1980-83	Assistant Professor	Dept. Electrical Engineering, Technical U. Gdansk
1983-84	Assistant Professor	School of Computer Science, McGill University, Montreal
1985-88	Assistant Professor	Dept. of Computer Sciences, Purdue University
1988-1992	Associate Professor	Dept. of Computer Sciences, Purdue University
1992-	Professor	Dept. of Computer Sciences, Purdue University
2004-	Professor	Dept. Electrical & Computer Eng., Purdue University
2007-	Professor	President of the Republic of Poland
2008-	Saul Rosen Professorship	Purdue University
2010-	Director	NSF STC Center for Science of Information, Purdue U.
2015-	Distinguished Professor	Purdue University.
2020-	Professor	Jagiellonina University, Krakow, Poland.

Selected Visiting and Other Positions

1975	Student Training	Kokusai Densin Denwa, Tokyo, Japan
1989	Research Scientist	INRIA, Rocquencourt, France
1990	Visiting Scientist	Technical University of Vienna, Austria
1992-1993	Professeur Invité	INRIA, Rocquencourt, France
1996	Professeur Invité	INRIA, Sophia Antipolis, France
1998	Professeur Invité	INRIA, Rocquencourt, France
1999-2000	Visiting Professor	Electrical Engineering, Stanford University
2000	Visiting Professor	University of Witwatersrand, South Africa
2001	Professeur Invité	Université de Versailles Saint Quentin-en-Yvelines, France
2005	Professeur Invité	Université de Marne-la-Vallee, Paris, France
2006	Erskine Fellow	University of Canterbury, Christchurch, New Zealand
2006-2009	Visiting Scientist	Hewlett-Packard Labs, Palo Alto (summer)
2008-	Director	Istitute for Science of Information, Purdue University
2009	Visiting Professor	Ecole Politechnique, Paris, France
2010	Visiting Fellow	Isaac Newton Institute, Cambridge, England
2012	Visiting Professor	Gdansk University of Technology, Poland
2013	Guest Professor	ETH, Zurich, Switzerland
2026	Visisting Scientist	Centaur AI Institute

Research Interests

Analysis and design of algorithms, information theory, machine learning and AI, stability problems in distributed systems, modeling of computer and communication networks, multimedia compression, analytic combinatorics, discrete mathematics, and random structures.

PUBLICATIONS

Books

1. *Average-Case Analysis of Algorithms on Sequences*, John Wiley & Sons, New York, 2001 (551+ xxii pages).

2. *Analytic Pattern Matching: From DNA to Twitter*, (with P. Jacquet), Cambridge University Press, Cambridge, 2015 (332 + vii pages).

3. *Analytic Information Theory: From Compression to Learning*, (with M. Drmota), Cambridge University Press, 2023 (363 + x pages).

Book Chapters:

4. Performance evaluation of multiaccess systems with random access and feedback, Chapter V in *Introduction to Computer Communications*, 159–183, WKL, Warsaw 1984 (in Polish).

5. Towards computable stability criteria for some multidimensional stochastic processes, in *Stochastic Analysis of Computer and Communication Systems* (ed. H. Takagi), 131–172, Elsevier Science Publications B. V. (North-Holland), 1990.

6. Average case analysis of algorithms, Chap. 14 in *Handbook of Algorithms and Theory of Computation* (ed. M. Atallah), 14:1–14:38, CRC Press, Boca Raton 1998; second edition 2009.

7. Analytic Approach to Pattern Matching, Chap. 7 in *Applied Combinatorics on Words* (eds. Lothaire), Cambridge University Press (Encycl. of Mathematics and Its Applications), Cambridge, 2005.

Refereed Journals:

8. An approximate analysis of a packet switching system with multiple satellite channels (with K. Pawlikowski), *Systems Science*, vol. 5, 299–313, 1979.

9. An approximate analysis of the multiaccess system ALOHA with periodic reservation, *Rozprawy Elektrotechniczne*, vol. XXVII, 279–293, 1981 (in Polish).

10. Some problems in the design of electronic switching exchange (with M. Zientalski), *Telecommunication Review*, 2, 48–52, 1981, (in Polish).

11. Packet switching in multiple radio channels: analysis and stability considerations of a random access system, *Computer Networks*, 7, 17–26, 1983.

12. Analysis and stability considerations of a reservation system, *IEEE Transactions on Communications*, vol. COM-23, 684–692, 1983.

13. Some sufficient conditions for nonergodicity of Markov chains, *Journal of Applied Probability*, 22, 138–147, 1985.

14. Analysis and stability considerations of a random access system radio channels (with A. Kusiuk), *Rozprawy Elektrotechniczne*, vol. XXXI, 265–285, 1985.

15. On an asymptotic analysis of a tree-type algorithm for broadcast communications, *Information Processing Letters*, 23, 135–142, 1986.

16. Bounds for queue lengths in contention packet broadcast systems, *IEEE Transactions on Communications*, vol. COM-34, 1132–1140, 1986.

17. Solution of a linear recurrence equation arising in analysis of some algorithms, *SIAM Journal on Algebraic and Discrete Methods*, 8, 233–250, 1987.

18. On a recurrence equation arising in the analysis of conflict resolution algorithms, *Stochastic Models*, 3, 89–114, 1987.

19. An analysis of a contention resolution algorithm – Another approach, *Acta Informatica*, 24, 173–190, 1987.

20. Closed-network duals of multiqueues with application to token-passing systems (with V. Rego), *Computer Systems and Engineering*, 3, 127–139, 1988.

21. The evaluation of an alternative sum with applications to the analysis of some data structures, *Information Processing Letters*, 28, 13-19, 1988.

22. Some results on V-ary asymmetric tries, *Journal of Algorithms*, 9, 224–244, 1988.

23. Stability conditions for multidimensional queueing systems with computer applications, *Operations Research*, 36, 944–957, 1988.

24. Some theorems on instability of Markov chains with applications to multiaccess protocols (with V. Rego), *Operations Research*, 36, 958–966, 1988.

25. Some remarks on uniformly bounded Markov chains: Multimodality analysis, *Computers & Operations Research*, 16, 85–99, 1989.

26. Ultimate characterizations of the burst response of an interval searching algorithm (with Ph. Jacquet), *SIAM J. Computing*, 18, 777-791, 1989.

27. The presence of exponentiality in entropy maximised M|G1|1 queues (with V. Rego), *Computers & Operations Research*, 16, 441–449, 1989.

28. On the variance of the external path in a symmetric digital trie (with P. Kirschenhofer and H. Prodinger), *Discrete Applied Mathematics*, 25, 129–143, 1989 (Special issue on "Complexity and Combinatorics".)

29. On the balance property of Patricia tries: External path length viewpoint (with P. Kirschenhofer and H. Prodinger), *Theoretical Computer Science*, 68, 1–17, 1989.

30. Yet another application of binomial recurrence: Order statistics (with V. Rego), *Computing*, 43, 401–410, 1990.

31. Patricia tries again revisited, *Journal of the ACM*, 37, 691–711, 1990.

32. On the height of digital trees and related problems, *Algorithmica*, 6, 256–277, 1991.

33. A characterization of digital search trees from the successful search viewpoint, *Theoretical Computer Science*, 85, 117–134, 1991

34. Analysis of digital tries with Markovian dependency (with P. Jacquet), *IEEE Trans. on Information Theory*, 37, 1470–1475, 1991.

35. A note on the height of suffix trees (with L. Devroye and B. Rais), *SIAM J. Computing*, 21, 48–53, 1992.

36. Maximum size of a dynamic data structure: Hashing with lazy deletion revisited (with D. Aldous and M. Hofri), *SIAM J. Computing*, 21, 713–732, 1992.

37. Maximum queue length and waiting time revisited: Multiserver G|G|c queues (with Sadowsky), *Probability in the Engineering and Informational Science*, 6, 157–170, 1992.

38. Stability of token passing rings (with L. Georgiadis), *Queueing Systems* (Special Issue on "Polling Systems"), 11, 7–33, 1992.

39. Self-alignments in words and their applications (with A. Apostolico), *Journal of Algorithms*, 13, 446–467, 1992.

40. Probabilistic analysis of data structures: A reply to Professor Anderson's letter, Letter to the Editor, (with P.Kirschenhofer and H. Prodinger), *Theoretical Computer Science*, 106, 395-400, 1992.

41. A probabilistic analysis of a pattern matching problem, (with M. Atallah and P. Jacquet), *Random Structures & Algorithms*, 4, 191–213, 1993.

42. A limiting distribution for the depth in PATRICIA tries (with B. Rais and P. Jacquet), *SIAM J. Discrete Mathematics*, 6, 197–213, 1993.

43. A generalized suffix tree and its (un)expected asymptotic behaviors, *SIAM J. Computing*, 22, 1176–1198, 1993.

44. A note on binomial recurrences arising in the analysis of algorithms, Letter to the Editor, (with H. Prodinger), *Information Processing Letters*, 46, 309–311, 1993.

45. Multidimensional digital searching and some new parameters in tries (with P. Kirschenhofer and H. Prodinger) *International Journal of Foundation of of Computer Science*, 4, 69–84, 1993.

46. Asymptotic properties of data compression and suffix trees, *IEEE Trans. Information Theory*, 39, 1647–1659, 1993.

47. Autocorrelation on words and its applications. Analysis of suffix trees by string-ruler approach (with P. Jacquet), *J. Combinatorial Theory. Ser. A*, 66, 237–269, 1994.

48. Digital trees again revisited: The internal path length perspective (with P. Kirschenhofer and H. Prodinger), *SIAM J. Computing*, 23, 598–616, 1994.

49. Stability conditions for some multiqueue distributed systems: Buffered random access systems, *Advances in Applied Probability*, 26, 498–515, 1994.

50. Average profile and Limiting distribution for a phrase size in the Lempel-Ziv parsing algorithm (with G. Louchard), *IEEE Trans. Information Theory*, 41, 478–488, 1995.

51. A scheduling policy with maximal stability region for ring networks with spatial reuse (with L. Georgiadis and L. Tassiulas), *Queueing Systems*, 19, 131–148, 1995.

52. Asymptotic behavior of the Lempel-Ziv parsing scheme and digital search trees (with P. Jacquet), *Theoretical Computer Science*, 144, 161–197, 1995.

53. Combinatorial optimization problems for which almost every algorithm is asymptotically optimal, *Optimization*, 33, 359-368, 1995.

54. The probability of large queue lengths and waiting times in a heterogeneous multiserver queue. Part I: Tight limits (with J. Sadowsky), *Advances in Applied Probability*, 27, 532-566, 1995.

55. Probabilistic analysis of a string editing problem and its variations (with G. Louchard), *Combinatorics, Probability & Computing*, 4, 143-166, 1995.

56. On asymptotics of certain sums arising in coding theory, *IEEE Trans. Information Theory*, 41, 2087-2090, 1995.

57. On pattern occurrences in a random text (with I. Fudos and E. Pitoura), *Information Processing Letters*, 57, 307-312, 1996.

58. On the distribution for the duration of a randomized leader election algorithm (with J. Fill and H. Mahmoud), *Annals of Applied Probability*, 6, 1260–1283, 1996.

59. Analysis of a splitting process arising in probabilistic counting and other related algorithms (with P. Kirschenhofer and H. Prodinger), *Random Structures & Algorithms*, 9, 379–402, 1996.

60. On the average redundancy rate of the Lempel-Ziv code (with G. Louchard), *IEEE Trans. Information Theory*, 43, 2–8, 1997.

61. Stability analysis of quota allocation access protocols in ring networks with spatial reuse (with L. Georgiadis and L. Tassiulas), *IEEE Trans. Information Theory*, 43, 923–937, 1997.

62. A suboptimal lossy data compression based on approximate pattern matching (with T. Łuczak), *IEEE Trans. Information Theory*, 43, 1439–1451, 1997.

63. Analysis of an asymmetric leader election algorithm (with S. Janson), *Electronic J. of Combinatorics*, 4, R17, 1997.

64. Greedy algorithms for the Shortest Common Superstring Problem that are asymptotically optimal (with A. Frieze), *Algorithmica*, 21, 21–36, 1998 (invited after the presentation at *European Symposium on Algorithms*, Barcelona, 1996).

65. Analytical depoissonization and its applications (with P. Jacquet), *Theoretical Computer Science* in "Fundamental Studies" Section, 201, No. 1-2, 1–62, 1998.

66. On asymptotics of certain recurrences arising in universal coding, *Problems of Information Transmission*, 34, No.2, 142-146, 1998.

67. On pattern frequency occurrences in a Markovian sequence (with M. Régnier), *Algorithmica*, 22, 631-649, 1998.

68. Philippe Flajolet's research in analysis of algorithms and combinatorics, (with H. Prodinger) *Algorithmica*, 22, 366-387, 1998.

69. Average profile for the generalized digital search trees and the generalized Lempel-Ziv algorithm, (with G. Louchard and J. Tang), *SIAM J. Computing*, 28, 935-954, 1999.

70. Quicksort algorithm again revisited (with C. Knessl), *Discrete Mathematics and Theoretical Computer Science*, 3, 43-64, 1999.

71. Entropy computations via analytic depoissonization (with P. Jacquet), *IEEE Trans. Information Theory*, 45, 1072-1081, 1999.

72. Indexing and Mapping of Proteins Using a Modified Nonlinear Sammon's Projection (with I. Apostol), *Journal of Computational Chemistry*, 20, 1049-1059, 1999.

73. Pattern matching image compression: Algorithmic and empirical results (with M. Atallah and Y. Genin), *IEEE Trans. Pattern Analysis and Machine Intelligence*, 21, 618-627, 1999.

74. A note on the asymptotic behavior of the height in b-tries for b Large (with C. Knessl), *Electronic J. of Combinatorics*, 7, R39, 2000.

75. Asymptotic Behavior of the Height in a Digital Search Tree and the Longest Phrase of the Lempel-Ziv Scheme (with C. Knessl), *SIAM J. Computing*, 30, 923-964, 2000.

76. Asymptotic Average Redundancy of Huffman (and other) Block Codes, *IEEE Trans. Information Theory*, 46, 2434-2443, 2000.

77. On Average Redundancy Rate of the Lempel-Ziv Codes with K-error Protocol (with Y. Reznik), *Information Sciences*, 135, 57-70, 2001 (Special issue on "Dictionary Based Compression").

78. Average Profile of the Lempel-Ziv Parsing Scheme for a Markovian Source (with P. Jacquet and J. Tang), *Algorithmica*, 31, 318–360, 2001.

79. 2D-Pattern Matching Image and Video Compression: Theory, Algorithms, and Experiments (with M. Alzina and A. Grama), *IEEE Trans. on Image Processing*, 11, 318-331, 2002.

80. A Universal Predictor Based on Pattern Matching (with P. Jacquet and I. Apostol), *IEEE Trans. Information Theory*, 48, 1462-1472, 2002. (Special issue in memory of Aaron Wyner.)

81. Optimal Versus Randomized Search of Fixed Length Binary Words (with H. Prodinger), *IEEE Trans. Information Theory*, 48, 2614-2621, 2002.

82. Limit Laws for Heights in Generalized Tries and PATRICIA Tries (with C. Knessl), *J. Algorithms*, 44, 63-97, 2002.

83. Analytic Variations on Redundancy Rates of Renewal Processes (with P. Flajolet), *IEEE Trans. Information Theory*, 48, 2911 -2921, 2002.

84. The Height of a Binary Search Tree: The Limiting Distribution Perspective (with C. Knessl), *Theoretical Computer Science*, 289, 649-703, 2002.

85. Markov Types and Minimax Redundancy for Markov Sources (with P. Jacquet), *IEEE Trans. Information Theory*, 50, 1393-1402, 2004.

86. Problems on Sequences: Information Theory and Computer Science Interface (with J. Kieffer and E-H. Yang), *IEEE Trans. Information Theory*, 50, 1385-1392, 2004

87. Compact Suffix Trees Resemble PATRICIA Tries: Limiting Distribution of Depth (with P. Jacquet and B. McVey), *Journal of the Iranian Statistical Society*, 3, 139-148, 2004.

88. On the Number of Full Levels in Tries (with C. Knessl). *Random Structures & Algorithms*, 25, 247-276, 2004.

89. Precise Minimax Redundancy and Regrets (with M. Drmota), *IEEE Trans. Information Theory*, 50, 2686-2707, 2004.

90. An Efficient Algorithm for Detecting Frequent Subgraphs in Biological Networks, (with M. Koyuturk, and A. Grama), *Bioinformatics*, Suppl. 1: Proc. 12th Intl. Conf. Intelligent Systems for Molecular Biology (ISMB'04), 200-207, 2004.

91. On Average Sequence Complexity, (with S. Janson and S. Lonardi), *Theoretical Computer Science*, 326, 213–227, 2004.

92. Exploring the Characetristics of Sequences Elements in proximal Promotoers of Human Genes, (with M. Bina, P. Wyss, W. Ren, E. Thomas, R. Randhawa, S. Reddy, P. John, E. Pares-Matos, A. Stein, H. Xu, and S. Lazarus), *Genomics*, 84, 929-940, 2004.

93. Reliable Detection of Episodes in Event Sequences (with R. Gwadera and M. Atallah), *Knowledge and Information Systems (KAIS)*, 7, 415 - 437, 2005.

94. Probabilistic Behavior of Asymmetric LC-Tries (with L. Devroye), *Random Structures & Algorithms*, 27, 185-200, 2005.

95. An Optimal DNA Segmentation Based on the MDL Principle, (with W-H. Ren and L. Szpankowski), *Int. J. of Bioinformatics Research and Applications*, 1, 3-17, 2005.

96. Enumeration of Binary Trees and Universal Types (with C. Knessl), *Discrete Mathematics and Theoretical Computer Science*, 7, 313-400, 2005.

97. Hidden Word Statistics (with P. Flajolet and B. Vallée), *Journal of the ACM*, 53, 1-37, 2006.

98. Multicast Tree Structure and the Power Law. *IEEE Trans. Information Theory*, (with C. Adjih, L. Georgiadis and P. Jacquet), 52, 1508- 1521, 2006.

99. Pairwise Alignment of Protein Interaction Networks (with M. Koyuturk,Y. Kim, U. Topkara, S. Subramaniam, A. Grama), *J. Computational Biology*, 13, 182-199, 2006.

100. On the Joint Path Lengths Distribution in Random Binary Trees (with C. Knessl) *Studies in Applied Mathematics*, 117, 109-147, 2006.

101. Detecting conserved interaction patterns in biological networks, (with M. Koyuturk, Y. Kim, S. Subramaniam, and A. Grama) *J. Computational Biology*, 13, 1299-1322, 2006.

102. Finding Biclusters By Random Projections, (with S. Lonardi and Q. Yang), *Theoretical Computer Science*, 368, 217-230, 2006.

103. Assessing Significance of Connectivity and Conservation in Protein Interaction Networks (with M. Koyuturk and A. Grama), *J. Computational Biology*, 14, 747-764, 2007.

104. Partial Fillup and Search Time in LC Tries (with S. Janson), *ACM Trans. on Algorithms*, 3, 44:1-44:14, 2007.

105. Error Resilient LZ'77 Data Compression: Algorithms, Analysis, and Experiments (with S. Lonardi and M. Ward), *IEEE Trans. Information Theory*, 53, 1799-1813, 2007.

106. Randomized Leader Election (with M. Ramanathan, R. Ferreira, S. Jagannathan, and A. Grama) *Distributed Computing*, 19, 403-418, 2007.

107. Identifying Statistical Dependence in Genomic Sequences via Mutual Information Estimates, (with H. Aktulga, I. Kontoyiannis, L. Lyznik, L. Szpankowski, A. Grama) *EURASIP Journal on Bioinformatics and Systems Biology*, Article ID 14741, 11 pages, 2007.

108. Waiting Time Distribution for Pattern Occcurrences in a Constrained Sequence, (with V. Stefanov), *Discrete Mathematics and Theoretical Computer Science*, 9, 305-320, 2007.

109. On the Entropy of a Hidden Markov Process, (with P. Jacquet and G. Seroussi), *Theoretical Computer Science*, 395, 203-219, 2008.

110. A One-to-One Code and Its Anti-redundancy, *IEEE Trans. Information Theory*, 54, 4762-4766, 2008.

111. On the Construction of (Explicit) Khodak's Code and Its Analysis (with Y. Bugeaud and M. Drmota), *IEEE Trans. Information Theory*, 54, 5073-5086, 2008.

112. Multiple Choice Tries, (with L. Devroye, G. Lugosi, G. Park), *Random Structures & Algorithms*, 34, 337-367, 2009.

113. Discovering Sequences with Potential Regulatory Characteristics (with M. Bina et al.), *Genomics*, 93, 314-322, 2009.

114. Profile in Tries (with G. Park, H-K. Hwang and P. Nicodeme), *SIAM J. Computing*, 38, 5, 1821-1880, 2009.

115. On the Average Profile of Symmetric Digital Search Trees (with C. Knessl), *Analytic Combinatorics*, 4, article #6, 2009.

116. A Universal Caching Algorithm Based on Pattern Matching (with G. Panduranggan), *Algorithmica*, 57, 62-73, 2010.

117. Tunstall Code, Khodak Variations, and Random Walks (with M. Drmota and Y. Reznik), *IEEE Trans. Information Theory*, 56, 2928 - 2937, 2010.

118. Noisy Constrained Capacity for BSC (with P. Jacquet), *IEEE Trans. Information Theory*, 56, 5412- 5423, 2010.

119. Constrained Pattern Matching (with Y. Choi), *ACM Trans. Algorithms*, 7, 2, 25:1-25:19, 2011.

120. The Expected Profile of Digital Search Trees (with M. Drmota), *J. Combin. Theory, Ser. A*, 118, 1939-1965, 2011.

121. Minimum Expected Length of Fixed-to-Variable Lossless Compression without Prefix Constraints (with S. Verdu), *IEEE Trans. Information Theory*, 57, 4017 - 4025, 2011.

122. Compression of Graphical Structures: Fundamental Limits, Algorithms, and Experiments (with Y. Choi), *IEEE Trans. Information Theory*, 58, 620 - 638, 2012.

123. Counting Markov Types, Balanced Matrices, and Eulerian Graphs, (with P. Jacquet and C. Knessl), *IEEE Trans. Information Theory*, 58, 4261-4272, 2012.

124. Minimax Pointwise Redundancy for Memoryless Models over Large Alphabets, (with M. Weinberger). *IEEE Trans. Information Theory*, 58, 4094-4104, 2012.

125. On a Recurrence Arising in Graph Compression, (with Y. Choi and C. Knessl), *Electronic Journal of Combinatorics*, P#15, 19, 3, 2012.

126. Algorithms, Combinatorics, Information, and Beyond, *IEEE Information Theory Society Newsletter*, 62, 5-20, 2012.

127. Deinterleaving Finite Memory Processes via Penalized Maximum Likelihood (with G. Seroussi and M. Weinberger), *IEEE Trans. Information Theory*, 58, 7094-7109, 2012.

128. Uncertainty Estimates of Purity Measurements Based on Current Information: Toward a "Live Validation" of Purity Methods, (with Izydor Apostol, Grace Jiang1, Gang Huang1, Jette Wypych, Xin Zhang, Jessica Gastwirt, Ken Chen, Szilan Fodor, Suminda Hapuarachchi, Dave Meriage, Frank Ye, Drew Kelner, Leszek Poppe). *Pharmaceutical Research*, 29, 3404-3419, 2012.

129. A Discrete Divide and Conquer Recurrence, (with M. Drmota), *J. of the ACM*, 60, 3, 16:1-16:49, 2013.

130. Average Redundancy of the Shannon Code for Markov Sources, (with N. Merhav), *IEEE Trans. Information Theory*, 59, 7186-7193, 2013.

131. A Note on a Problem Posed by D. E. Knuth on a Satisfiability Recurrence, (with P. Jacquet and C. Knessl), *Combinatorics, Probability, and Computing*, 23, 839-841, 2014.

132. On Symmetry of Uniform and Preferential Attachment Graphs, (with A. Magner, S. Janson, G. Kollias), *Electronic J. Combinatorics*, 21, P3.32, 2014.

133. On the Limiting Distribution of Lempel Ziv'78 Redundancy for Memoryless Sources, (with P. Jacquet) *IEEE Trans. Information Theory*, 60, 6917-6930, 2014.

134. On the Origin of Protein Superfamilies and Superfolds (with A. Magner and D. Kihara), *Nature Scientific Reports*, 5: 8166, 2015.

135. Markov Field Types and Tilings, (with Y. Baryshnikov and J. Duda), *IEEE Trans. Information Theory*, 62, 4361-4375, 2016.

136. Fundamental Bounds for Sequence Reconstruction from Nanopore Sequencers, (with A. Magner, J. Duda and A. Grama) *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, 2, 92-106, 2016.

137. A Study of the Boltzmann Sequence-Structure Channel (with A. Magner and D. Kihara), *Proc. of the IEEE*, 105, 2, 286-305, 2017

138. Redundancy of Lossless Data Compression for Known Sources by Analytic Methods, (with M. Drmota) *Foundations and Trends in Communications and Information Theory*, 13: 4, 277-417. 2017.

139. Profile of PATRICIA Tries, (with A. Magner), *Algorithmica*, 80, 331-397, 2018.

140. Frontiers of Science of Information: Shannon Meets Turing, (with A. Grama), *IEEE Computer*, 51(1), 32-42, 2018.

141. Posterior Agreement for large Parameter-Rich Optimization Problems (with J. Buhmann, J. Dumazert, A. Gronskiy), *Theoretical Computer Science*, 745, 1-22, 2018.

142. Lossless Compression of Binary Trees with Correlated Vertex Names (with A. Magner and K. Turowski), *IEEE Trans. Information Theory*, 64, 6070-6080, 2018.

143. Entropy and Optimal Compression of Some General Plane Trees (with Z. Golebiewski and A. Magner) *ACM Transactions on Algorithms*, vol. 15, issue 1, article 3, 2018.

144. Inferring Temporal Information from a Snapshot of a Dynamic Network (with J. Sreedharan, A. Magner and A. Grama), *Nature Scientific Reports*, 9: 3057, 2019.

145. Asymmetric Renyi Problem, (with M. Drmota and A. Magner) *Combinatorics, Probability, Computing*, 28, 4, 542-573, 2019.

146. Asymmetry and Structural Informtion in Preferential Attachment Graphs (with T. Luczak and A. Magner), *Random Structures and Algorithms*, vol. 55, 3, 696-718, 2019.

147. The Trade-off between Privacy and Fidelity via Ehrhart Theory (with A. Padakandla and P. R. Kumar), *IEEE Trans. Information Theory*, 66, 2549-2569, 2020

148. Prediction of precision for purity methods (with I. Apostol, R. Wu, M. Ko1, , JL Song, L. Li, G. Schlobohm1) *Journal of Pharmaceutical Sciences*, 109, 4, 1467-1472 2020.

149. Randomized Linear Algebra Approaches to Estimate the Von Neumann Entropy of Density Matrices (with Eugenia-Maria Kontopoulou, Ananth Grama, and Petros Drineas), *IEEE Trans. Information Theory*, 66, 5003-5021, 2020.

150. Compression of Dynamic Graphs Generated by a Duplication Model (with K. Turowski and A. Magner), *Algorithmica*, 82, 2687-2707, 2020

151. Joint String Complexity for Markov Sources: Small Data Matters (with P. Jacquet and D. Milioris) *Theoretical Computer Science*, 844, 6, 46-80, 2020.

152. Towards Degree Distribution of Duplication Graph Models (with K. Turowski) *Electronic J. Combinatorics*, 28, 1, P1.18, 2021.

153. Hidden Words Statistics for Large Patterns (with S. Janson), *Electronic J. Combinatorics*, 28(2), #P2.26 2021.

154. Revisiting Parameter Estimation in Biological Networks: Influence of Symmetries (with K. Turowski and J. Sreedharan), *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 18(3), 836-849, 2021.

155. Temporal Ordered Clustering in Dynamic Networks: Unsupervised and Semi-supervised Learning Algorithms (with K. Turowski and J. Sreedharan) *Transactions on Network Science and Engineering*, 8(2), 1426-1442, 2021.

156. Sequential Universal Compression for Non-Binary Sequences with Constrained Distributions (with M. Drmota and G. Shamir), *Communications in Information and Systems*, 22(1), 1-38, 2022

157. Data-derived weak universal consistency (with N. Santhanam and V. Anantharam) *JMLR*, (27):1-55, 2022.

158. Sufficiently Informative and Relevant Features: An Information-theoretic and Fourier-based Characterization (with M. Heidari, J. Sreedharan and G. Shamir), *IEEE Trans. Information Theory*, 68, 6063-6077, 2022.

159. Compression and Symmetry of Small-World Graphs and Structures (with I. Kontoyiannis, Y-H. Lim, K. Papakonstantinopoulou) *Communications in Information and Systems*, 2, 275-302, 2022.

160. Regret Bounds for Log-loss via Bayesian Algorithms (with Changlong Wu, Mohsen Heidari, and Ananth Grama) *Trans. Information Theory*,69, 9, 5971-5989, 2023.

161. Expected Worst Case Regret via Stochastic Sequential Covering (with Changlong Wu, Mohsen Heidari, and Ananth Grama) *Transactions on Machine Learning Research*, 2023.

162. On the concentration of the maximum degree in the duplication-divergence models (with Alan Frieze and K. Turowski) *SIAM Discrete Mathematics*, 38(1), 988-1006, 2024.

163. Precise Regularized Minimax Regret with Unbounded Weights (with M. Drmota, P. Jacquet and Changlong Wu), *Trans. Information Theory*, 71, 8753-8776, 2025.

164. Online Universal Learning from Information-theoretic Perspective (with Changlong Wu and Ananth Grama) *Foundation and Trends in Communication and Information Theory*, 2026 (230 pages)

165. Fundamental Limits Incorporating Logical Reasoning Into Shannon's Information Theory (with Luis Lastras, Barry Trager, Jonathan Lenchner, Chai Wah Wu, Mark Squillante, Ron Fagin, Alex Gray) *Proceedings of National Academy of Science* (PNAS), 123, 2026.

Refereed Conference Proceedings:
`[Note: Many conference papers are preliminary versions of journal papers.]`

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157. A Study of the Boltzmann Sequence-Structure Channel (with A. Magner and D. Kihara), *ISIT'2016*, 255-259, Barcelona, 2016.

158. Lossless Compression of Binary Trees with Correlated Vertex Names (with A. Magner and K. Turowski), *ISIT'2016*, 1217-1221, Barcelona, 2016.

159. Asymmetric Renyi Problem and PATRICIA Tries (with A. Magner and M. Drmota), *27th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, AofA'16, 68-85, Krakow, 2016.

160. Average Size of a Suffix Tree for Markov Sources (with P. Jacquet), *27th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, AofA'16, Krakow, 2016.

161. On Symmetries of Non-Plane Trees in a Non-Uniform Model, (with J. Cichon, A. Magner and K. Turowski), *ANALCO*, Barcelona, 2017.

162. Phase Transitions in Parameter Rich Optimization Problems, (with J. Buhmann, J. Dumazerti, A. Gronskiy), *ANALCO*, Barcelona, 2017.

163. Entropy of Some General Plane Trees (with Z. Golebiewski and A. Magner), *ISIT 2017*, Aachen, Germany, 2017.

164. Recovery of Vertex Orderings in Dynamic Graphs (with A. Magner, A. Grama, and J. Sreedharan) *ISIT 2017*, Aachen, Germany, 2017.

165. TIMES: Temporal Information Maximally Extracted from Structures, (with A. Magner, A. Grama, and J. Sreedharan) *WWW 2018*, Lyon, Apr 23-27, 2018

166. Randomized Linear Algebra Approaches to Estimate the Von Neumann Entropy of Density Matrices (with Eugenia-Maria Kontopoulou, Ananth Grama, and Petros Drineas), 2486-2490, *ISIT 2018*, Veil, Colorado.

167. Preserving Privacy and Fidelity via Ehrhart Theory (with A.Padakandla and P.R. Kumar), *ISIT 2018*, 696-700, Veil, Colorado.

168. Free Energy Asymptotics for Problems With Weak Solution Dependencies (with J. Buhmann and A. Gronskiy), *ISIT 2018*, 2132-2136, Veil, Colorado.

169. Compression of Dynamic Graphs Generated by a Duplication Model (with K. Turowski and A. Magner) *56th Annual Allerton Conference on Communication, Control, and Computing*, Urbana, 2018.

170. Compression of Preferential Attachment Graphs (with T. Luczak and A. Magner), *ISIT'19*, Paris, 2019.

171. Asymptotics of Entropy of the Dirichlet-Multinomial Distribution (with K. Turowski and P. Jacquet), *ISIT'19*, Paris, 2019.

172. Revisiting Parameter Estimation in Biological Networks: Influence of Symmetries (with K. Turowski and J. Sreedharan), *18th International Workshop on Data Mining in Bioinformatics*, Anchorage, 2019. (see BIOKDD'19)

173. Toward Universal Testing of Dynamic Models (with A. Magner) *31st International Conference on Algorithmic Learning Theory*, *International Conference on Algorithmic Learning Theory*, ALT'20, San Diego, February 2020; Proceedings of Machine Learning Research, PMLR 117:615-633, 2020.

174. Hidden Words Statistics for Large Patterns (with S. Janson) *31st International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms* (AofA2020), June 2020; LIPIcs, Volume 159, AofA 2020 Papers Paper No. 16.

175. Power-Law Degree Distribution in the Connected Component of a Duplication Graph (with P. Jacquet and K. Turowski) *31st International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms* (AofA2020), June 2020. LIPIcs, Volume 159, AofA 2020 Papers Paper No. 14.

176. Analysis of Lempel-Ziv'78 for Markov Sources (with P. Jacquet) *31st International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, (AofA2020), June 2020 LIPIcs, Volume 159, AofA 2020 Papers Paper No. 15.

177. Degree Distribution for Duplication-Divergence Graphs: Large Deviations. In: Adler I., Muller H. (eds) *Graph-Theoretic Concepts in Computer Science* (WG 2020). Lecture Notes in Computer Science, vol 12301, 226-237, 2020.

178. Precise Minimax Regret for Logistic Regression with Categorical Feature Values (with P. Jacquet and G. Shamir) *32st International Conference on Algorithmic Learning Theory*, ALT'21, Paris, 2021; *Proceedings of Machine Learning Research*: PMLR 132, 755-771, 2021

179. Information Sufficiency via Fourier Expansion (with M. Heidari, J. Sreedharan, and G. Shamir) ISIT'2021 , Melbourne, Australia.

180. On maximum-likelihood estimation in the all-or-nothing regime (with J. Buhmann, L. Corinzia, and P. Penna) ISIT'2021 , Melbourne, Australia.

181. A Theoretical Framework for Learning from Quantum Data (with M. Heidari and A. Padakandla) ISIT'2021 , Melbourne, Australia.

182. A Lower Bound for Regret in Logistic Regression (with G. Shamir) ISIT'2021 , Melbourne, Australia.

183. Finding Relevant Information via Discrete Fourier Expansion (with M. Heidari, J. Sreedharan, and G. Shamir) *Thirty-eighth International Conference on Machine Learning* (ICML'21), PMLR 139:4181-4191, 2021.

184. The concentration of the maximum degree in the duplication-divergence models (with A. Frieze and K. Turowski) LNCS 13025, COCOON, 2021.

185. Toward Physically Realizable Quantum Neural Networks (with M. Heidari, A. Grama) AAAI, Vancouver, 2022

186. Statistical and computational thresholds for the planted k-densest sub-hypergraph problem (with J. Buhmann, L. Corinzia, and P. Penna) *PMLR* 151:11615-11640; AISTAT, 2022.

187. Sequential vs Fixed Design Regrets in Online Learning (with C. Wu, M. Heidari, and A. Grama) *ISIT*, 2022.

188. Precise Minimax Regret for Logistic Regression (with P. Jacquet and G. Shamir) *ISIT*, 2022.

189. Precise Regret Bounds for Log-loss via a Truncated Bayesian Algorithm (with Changlong Wo, Mohsen Heidari, and Ananth Grama), *NeurIPS*, New Orleans, 2022 (selected for oral presentation). i

190. Agnostic PAC Learning of k-Juntas Using L2-Polynomial Regression (with M. Heidari) *AISTAT*, PMLR 206:2922-2938, 2023.

191. Learning k-qubit Quantum Operators via Pauli Decomposition (with M. Heidari) *AISTAT*, PMLR 206:490-504, 2023.

192. Learning Functional Distributions with private Labels (with Changlong Wu, Yifan Wang, and Ananth Grama), *40-th International Conference on Machine Learning*, Honolulu, Hawaii, USA. PMLR 202, 2023.

193. Online Learning in Dynamically Changing Environments (with Changlong Wu, and Ananth Grama), *COLT'23*, PMLR, 195, 1-34, Bangalore, 2023.

194. Online Distribution Learning with Local Privacy Constraints (with Jin Sima, Changlong Wu and O. Milenkovic), AISTAT, PMLR 238:460-468, 2024.

195. Low Complexity Approximate Bayesian Logistic Regression for Sparse Online Learning (with G. Shamir) *ISIT 2024*, Athens.

196. New Bounds on Quantum Sample Complexity of Measurement Classes (with Mohsen Heidari) *ISIT 2024*, Athens.

197. Minimax Regret with Unbounded Weights (with M. Drmota, P. Jacquet and Changlong Wu) *ISIT 2024*, Athens.

198. Oracle-Efficient Hybrid Online Learning with Unknown Distribution (with Changlong Wu and Jin Sima) *COLT' 2024*: Proceedings of Machine Learning Research vol 247:1-27, 2024.

199. Information-theoretic Limits of Online Classification with Noisy Labels (with Changlong Wu and A. Grama) *NeurIPS*, vol. 37, 2024.

200. No Free Lunch: Fundamental Limits of Learning Non-Hallucinating Generative Models (with Changlong Wu and A. Grama), *ICLR*, 2025.

201. Online Learning With Nasty Experts (with Nicolaos Papagiannis and Changlong Wu), ISIT , Ann Arbor, 2025

202. Agnostic Continuous-Time Online Learning (with Pramith Devulapalli, Changlong Wu, Ananth Grama) *NeurIPS*, 2025.

203. Robust Integrated Learning and Pauli Noise Mitigation for Parametrized Quantum Circuits (with Md Mobasshir Arshed Naved, Wenbo Xie, Ananth Grama) *NeurIPS*, 2025.

204. Hadamard Test is Sufficient for Efficient Quantum Gradient Estimation with Lie Algebraic Symmetries (with M. Heidari, M. Mozakka), *NeurIPS*, 2025.

205. Phase Transition of Regret for Logistic Regression with Large Weights (with M. Drmota, P. Jacquet, and C. Wu) *37 International Conference on Algorithmic Learning Theory*, ALT'26, San Diego, February 2026; Proceedings of Machine Learning Research, PMLR 2026.

206. Certifying Capabilities from Finite Tests: When Is It Possible? (with Changlong Wu and Jin Sima) *ICML: Proceedings of Machine Learning Research*, vol. 306, 2026.

207. Testing Statistical Dependence in Labeled Graphs under Mismatches (with Nikolaos Papaginnis, Vasam Orabantu, and Ananth Grama) *KDD'26*, South Korea, 2026.

208. A Locality-Aware Surrogate for Natural-Gradient Descent in Quantum Optimization (with Md Mobasshir Arshed Naved, Wenbo Xie, Ananth Grama) ¡I¿NeurIPS ¡/a¿, 2026.

209. Optimizing Retraining Schedules via Learning Curves (with Jin Sima, Changlong Wu, and Ananth Grama) ¡i¿NeurIPS¡/a¿, 2026.

RECENT SOFTWARE PROJECTS:
(For details and demos see my homepage `http://www.cs.purdue.edu/homes/spa`.)

1. Pattern Matching Image Compression (with M. Atallah and Y. Genin); see publication [70] .

2. 2D Pattern Matching Image and Video Compression (with M. Alizna and A. Grama); see publication [75].

3. Indexing and Mapping of Proteins by Sammon's Projection Algorithm (with I. Apostol); see publication [69].

4. Audio Compression based on Pattern Matching (with A. Grama and R. Gwadera).

5. Streaming Video Using Mobile Code (with A. Grama). Patent disclosure December 2002.

6. Finding Reliable Threshold for Intrusion Detection.

7. Joint Source–Channel Lempel-Ziv'77: Truly resilent Lempel-Ziv'77 (with S. Lonardi). Patent disclosure February 2003.

8. MULE: Metabolic Pathway Mining Software (with M. Koyuturk and A. Grama).

9. MaWISh: Pairwise Alignment of Protein Interaction Networks (with M. Koyuturk and A. Grama).

10. SIDES: An Algorithm for Identifying Significantly Dense Subgraphs (with M. Koyuturk and A. Grama).

Patents and Disclosures

1. A method of channel switching in a computer network (in Polish: "Sposob sterowania procesami komutacyjnymi w wezle sieci teleinformatycznej z komutacja kanalow zbudowanym na bazie systemu komputerowego"), with A. Badach, R. Sobczak and M. Zientalski. Patent PRL No. 126 509, 1982.

2. "Real-Time Multimedia Decoder Using Mobile Code" (with A. Grama), disclosure No. P-02127 (patent application 60/462,253

3. "Error Resilient Lempel-Ziv Based Data Compression Schemes", (with S. Lonardi), disclosure No. P-03019.

4. “Approximate Bayesian l ogistic regression for sparse online learning” (G. I. Shamir and W. Szpankowski), filed 2020-10-02.

PROFESSIONAL RECOGNITION

Awards, Honors, Fellowships

1969	Second level of Mathematical Olimpiad, Toruń, Poland.
1970	Second level of Mathematical Olimpiad, Toruń, Poland.
1973	First place in “Copernicus Competition” for the best student of the Electronics Department of Technical University of Gdansk
1974	First place in “Czerwona Różа” Competition for the best student of the Technical University of Gdansk
1975	Best Paper Award for the conference *Works of the I National Symp. of Students Scientific Association*, Wroclaw, Poland
1975	Competitive IASTE Fellowship in Kokusai Densin Denwa, Tokyo, Japan
1977-1980	Award of the President of the Technical University of Gdansk
1983	Alexander von Humboldt Fellowship (declined to accept an offer from the McGill University)
1997	A top finalist (from a set of three) for the Best Paper Award of the Information Theory Society.
1999 & 2002	Nomination for the Best Paper Award of the Information Theory Society.
2004	Fellow of the IEEE.
2006	Erskine Fellow, University of Canterbury, New Zealand.
2008	Saul Rosen Professorship in Computer Science, Purdue.
2009	Best Paper Award of the Faculty of Technical University of Vienna (paper [110]).
2010	Humboldt Research Award
2010	Leadership Award, Purdue University
2011	Seeds of Success, Purdue University
2012	Leadership Award and Team Award, Purdue University
2012	Excellence in Research, Purdue University
2015	Humboldt Research Award Supplement
2015	Inaugural Arden L. Bement Jr. Award
2020	Flajolet Lecture Prize
2021	Academia Europaea (elected)
2021	Fellow of AAIA (Asia-Pacific Artificial Intelligence Association)
2025	Fellow of Industry Academy within the International Artificial Intelligence Industry Alliance(
2025	National Academy of Artificial Intelligence (NAAI)
2026	Morrill Award, Purdue University
2026	Fellow, International Academy of Artifitial Intelligence Sciences (AAIS)

Editorial Boards:

- Field Editor, *Discrete Mathematics and Theoretical Computer Science*, 1995-.
- Managing Editor (Analysis of Algorithms, *Discrete Mathematics and Theoretical Computer Science*, 2002-2005.
- Editor, *Theoretical Computer Science*, 1998- 2012.
- Editor, *Foundation and Trends in Communications and Information Theory*, 2003-.

- Editor, *Int. Journal of Bioinformatics Research and Applications* (IJBRA), 2004 -.
- Editor, *ACM Transactions on Algorithms*, 2004 - 2015.
- Editor, *Combinatorics, Probability, Computing*, 2005 -.
- Editor, *IEEE Transactions on Information Theory*, 2005 - 2009.
- Editor, *Electronics and Telecommunications Quarterly*, 2008 -.
- Editor, *Algorithmica*, 2009 -.
- Editor, *Journal of Discrete Algorithms*, 2017 -.
- Editor, *Advances in the Theory of Computation and Computational Mathematics* (Book series), 1998-.
- Guest Editor, *IEEE Transactions on Automatic Control*, 1990-1992.
- Guest Editor, *Theoretical Computer Science*, 1994-1995.
- Guest Editor, *Random Structures & Algorithms*, 1995-1997.
- Guest Editor, *Algorithmica*, 1997-1998.
- Guest Editor, *Algorithmica*, 1998-1999.
- Guest Editor, *Random Structures & Algorithms*, 2000-2002.
- Guest Editor, *Combinatorics, Probability, & Computing*, 2002-2003.
- Guest Editor, *IEEE Trans. Information Theory*, 2003-2004.
- Guest Editor, *Algorithmica*, 2004-2005.
- Guest Editor, *IEEE Trans. Information Theory*: Special Issue on Molecular Biology and Neuroscience, 2008-2009.

Steering Committees

- Analysis fo Algorithms, AofA (together with P. Flajolet, D. E. Knuth, and B. Sedgewick)
- Analytic Algorithmics and Combinatorics, ANALCO (together with Flajolet, and B. Sedgewick)

Scientific Advisory Boards

- NeuroMat: Center for Neuromathematics, San Paolo, Brazil.
- Helsinki Institute for Information Technology HIIT, Finland.
- Scientific Advisory Councl for Centaur AI Institute
- Scientific Advisory Committee, Information Theory in mathematics, learning and the sciences Newton Intitutes Programme

Selected Program Committee Member:

- Member of Program Committee, *International Symposium PERFORMANCE'84*, Paris, 1984.
- Member of Program Committee, *PERFORMANCE'86 and ACM SIGMETRICS 1986, Joint Conference on Computer Performance Modeling, Measurement and Evaluation*, North Carolina State University, 1986.
- Member of Program Committee, *GLOBCOM 93*, Houston 1993.
- Organizer of Invited Sessions for several SIAM and ORSA Applied Probability conferences (1990, 1991, 1992, 1993, 1995), and Allerton Conference on Communication, Control and Computing (1995).
- Member of Organizing and Program Committee, *Fourth Int. Seminar on Average-Case Analysis of Algorithms*, Princeton 1998.
- Program Chair, *1999 Information Theory and Networking Workshop*, June 27–July 1, 1999, Metsovo Greece.
- Member of Organizing and Program Committee, *Fifth Seminar on the Analysis of Algorithms*, Barcelona 1999.
- Member of Program Committee, *19th IEEE International Performance, Computing, and Communications Conference* (IPCCC 2000), Phoenix, Arizona, February 20-22, 2000.
- Conference Chair, *Sixth Seminar on the Analysis of Algorithms*, Krynica Morska, Poland, 2000.
- Member of Program Committee, *2000 IEEE International Symposium on Information Theory*, Sorento, Italy, June 25–30, 2000.
- Member of Program Committee, *2-nd International Symposium on Advanced Concepts for Intelligent Vision Systems* (ACIVS'00), Baden-Baden, July 31 – August 4, 2000.
- Member of Program Committee, *Seventh Seminar on the Analysis of Algorithms*, Tatihou, France, July 2–8, 2001.
- Member of Program Committee, *3-nd International Symposium on Advanced Concepts for Intelligent Vision Systems* (ACIVS'01), Baden-Baden, July 30 – August 3, 2001.
- Member of Program Committee, *The 21st International Performance, Computing and Communications Conference*, Phoenix, Arizona, April 3-5, 2002.
- Member of Program Committee, *Eighth Seminar on the Analysis of Algorithms*, Strobl, Austria, June 23-28, 2002.
- Member of Program Committee, *4-th International Symposium on Advanced Concepts for Intelligent Vision Systems* (ACIVS'02), Ghent, Belgium, September 9-11, 2002.

- Member of Program Committee, *The Sixth International Conference on Software Computing and Distributed Processing*, Rzeszow, Poland, June 25-25, 2002.
- Member of Program Committee, *Ninth International Seminar on the Analysis of Algorithms*, San Miniato - Pisa (Italy), June 22-28, 2003.
- Invited session orginizer and chair, *2003 Information Theory Workshop*, Hong Kong, July 6-10, 2003 (cancelled).
- Member of Program Committee, *5-th International Symposium on Advanced Concepts for Intelligent Vision Systems* (ACIVS'03), Ghent, Belgium, September 2-5, 2003.
- Chair, NSF Workshop on *Information Theory and Computer Science Interface*, Chicago, October 2003.
- Member of Program and Organizing Committee, *1st Workshop on Analytic Algorithmics and Combinatorics* (ANALCO 04) January 10, 2004, New Orleans.
- Member of Program Committee, *HiCOMB, 3-rd International Workshop on High Performance Computational Biology*, Santa Fe, April, 2004.
- Member of Program Committee, *II Conference on Information Technology*, Gdansk, May 16-18, 2004.
- Chair, *Tenth International Seminar on the Analysis of Algorithms*, MSRI, Berkeley, June 14-18, 2004.
- Member of Program Committee, *6-th International Symposium on Advanced Concepts for Intelligent Vision Systems* (ACIVS'04), Ghent, Belgium, August 2004.
- Member of Program Committee, *11th International Conference on String Processing and Information Retrieval* (SPIRE), October 5-8, 2004, Padova, Italy.
- Member of Program Committee, *2004 IEEE Information Theory Workshop*, October 24-29 in San Antonio, Texas
- Member of Program Committee, *III Conference on Information Technology*, Gdansk, May 2005.
- Member of Program Committee, *2005 IEEE International Symposium on Information Theory*, Adelaide, Australia, September 4-9, 2005.
- Co-Chair, *Information Beyond Shannon*, Orlando, October 27-28, 2005.
- Member of Program Committee, *10th Panhellenic Conference on Informatics*, Volos, Greece, November 11-13, 2005.
- Program Committee Member, *Information Theory Workshop*, Punta del Este, Uruguay, March 14-17, 2006.
- Progra Committee Member, *IV Conference on Information Technology*, Gdansk, May 21-24, 2006.
- Member of Program Committee, *2006 IEEE International Symposium on Information Theory*, Seatle, July 9-14, 2006.

- Member of Program Committee, *European Conference on Computational Biology*, Eliat, Isreal, September 10-13, 2006.
- Member of Program Committee, *First International Multiconference on Computer Science and Information Systems*, Wisla, Poland, 6-10, November 2006.
- Member of Program Committee, *11TH PANHELLENIC CONFERENCE ON INFORMATICS*, Patras, Greece, May, 2007
- Member of Program Committee, *V Conference on Information Technology*, Gdansk, May 20-23, 2007.
- Member of Program Committee, Seventh IEEE International Conference on Data Mining, Oct 28-31, 2007, in Omaha, Nebraska
- Member of Program Committee, *5th International Workshop on Biological Data Management*, Regensburg (Germany), September 3-7 2007.
- Member of Program Committee, *International Multiconference on Computer Science and Information Technology*, (IMCSIT), October 15-17, 2007, Wisla, Poland.
- Co-Chair, *Analytic Algorithms and Combinatorics* (ANALCO'08), Jan. 19, 2008.
- Member of Program Committee, *2008 IEEE Information Theory Workshop*, May 5-9, 2008, Porto, Portugal.
- Member of Program Committee, *Information Theory and Statistical Learning (ITSL)*, Las Vegas, June 23-24, 2008.
- Member of Program Committee, *2008 IEEE International Symposium on Information Theory*, Toronto, July 6-11, 2008.
- Member of Program Committee, SIBIRCON-2008 *International Conference on Computational Technologies in Electrical and Electronics Engineering*, Novosibirsk, July 21-25, 2008.
- Member of Program Committee, Fifth Colloquium on Mathematics and Computer Science, September 22-26, 2008, Blaubeuren, Germany.
- Member of Program Committee, *2009 IEEE International Symposium on Information Theory*, Seoul, South Korea, June 28 - July 3, 2009.
- Member of Program Committee, ACM-SIAM Symposium on Discrete Algorithms (SODA'10), Austin, Texas, Jan 17-19, 2010.
- Member of Program Committee, 9th Symposium on Latin American Theoretical Informatics, LATIN 2010, Oaxaca, Mexico, April, 2010.
- Member of Program Committee, 2nd International IEEE Conference on Information Technology ICIT'2010, Gdansk, Poland, June 28-30, 2010.
- Member of Program Committee, SIBIRCON , Irkutsk, Russia, July 11 -15, 2010.
- Member of Program Committee, 21-st Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms, Vienna, June 28-July 2, 2010.

- Chair, STC Kick-off Workshop on Science of Information, Chicago, September 6-7, 2010.
- Co-Chair, Mini-Workshop: Random Trees, Information and Algorithms , Oberwolfach, April 24-30, 2011.
- 2011 IEEE International Symposium on Information Theory, St. Petersburg, Russia, July 31 to August 5, 2011.
- 2011 IEEE International Conference on Data Mining, Vancouver, Canada, December 11-14, 2011.
- 10th Symposium on Latin American Theoretical Informatics, LATIN 2012, Universidad Catolica San Pablo, Arequipa, Peru, April 16-20, 2012.
- Co-Chair, *Analytic Algorithms and Combinatorics* (ANALCO'13), Jan. 6, 2013.
- Member of Program Committee, *2013 IEEE International Symposium on Information Theory*, Istanbul, July 7-12, 2013.
- Chair *Big Data Workshop*, Waikiki, Hawaii, March 18-20, 2013.
- Member of Program Committee, *31st Symposium on Theoretical Aspects of Computer Science*, STACS 2014, Lyoan, March 5-8, 2014.
- Member of Program Committee, *25th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, AofA 2014, Paris, June 16-20, 2014.
- Program Co-Chair, *Knuth80: Algorithms, Combinatorics, and Information*, Pitea, Sweden, January 8-10, 2018.
- Member of Program Committee, *2018 IEEE International Symposium on Information Theory*, Veil, USA, June 17-22, 2018
- Member of Program Committee, *25th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, AofA 2014, Uppsala, Sweden, June 25-29, 2018.
- Member of Program Committee, *2018 International Society for Computational Biology*, Chicago, July 6-10, , 2018

NSF Panels and Workshops:

- Division of Networking and Communications.
- Computer–Communication Research.
- Formal and Mathematical Methods (FMM).

Consulting:

- Bell Communication Research, Morristown.

- ESPRIT III, LAURA Project (INRIA, France).
- Hewlett-Packart Laboratories, Palo Alto.
- ESPRIT, Project CATSERVER (INRIA, France)
- Jones International University.
- Kevin Kennedy & Associates Inc., Indianapolis.
- Gerson Lehrman Group.
- Google, Inc.

Memembership of Professional Organizations

- Institute of Electrical and Electronics Engineers (IEEE) (Fellow)
- Society for Industrial and Applied Mathematics (SIAM)
- The New York Academy of Sciences
- Mathematical Association of America
- Awards Committee of the IEEE Information Theory Society.
- Academia Europaea

Invited Talks:

1983 University Paris VI, France

1983 INRIA, France

1983 University of Toronto, Canada

1983 McGill University, Canada

1984 *Workshop on Queueing and Control Problems with Applications to Satellite and Other Communication Systems*, University of Maryland

1984 Wayne University, Detroit

1984 Purdue University

1986 Rutgers University

1986 Bell Communication Research, Morristown

1986 AT&T Lab., Murray Hill

1986 *25-th IEEE Conference on Decision and Control*, Athens, Greece

1987 University of Virginia

1987 University of Maryland, College Park

1989 INRIA, Rocquencourt, France

1990 *SIAM Conference on Applied Probability in Science and Engineering*, New Orleans

1990 *Workshop on Computing and Molecular Biology*, (invited participant), National Research Council, Washington

1990 Technical University of Gdansk, Poland

1990 Technical University of Vienna, Austria

1991 *ORSA Conference on Applied Probability in the Engineering, Informational and Natural Sciences*, Monterey

1991 INRIA, Rocquencourt, France

1991 NEC Research Institute, Princeton

1991 IBM Research Center, Yorktown Heights

1991 *Seminar on Random Graphs and Probabilistic Methods in Combinatorics and Computer Science "Random Graphs'91"*, Poznań, Poland

1992 *EURO/TIMS Conference*, Helsinki, Finland

1992 *IMS Workshop "Direction in Probability": Random Trees*, Boston

1992 INRIA, Rocquencourt, France

1992 INRIA, Sophia Antipolis, France

1992 Adam Mickiewicz University, Poznań, Poland

1993 *Average-Case Analysis Algorithms Seminar*, Dagstuhl, Germany.

1993 *31-st Annual Allerton Conference on Communication, Control, and Computing*, Allerton Park, IL.

1994 Colorado University, Boulder.

1994 Technical University of Gdansk, Poland.

1994 *Summer Course in Computer Science*, University of Helsinki, Finland.

1995 INRIA, Rocquencourt, France

1995 Institute Gaspard Monge, University Paris VI, Paris, France.

1995 *Average-Case Analysis Algorithms Seminar*, Dagstuhl, Germany.

1995 Carnegie Mellon University, Pittsburgh

1995 *33-st Annual Allerton Conference on Communication, Control, and Computing*, Allerton Park, IL.

1995 INRIA, Rocquencourt, France.

1996 INRIA, Sophia Antipolis, France.

1996 *Information Theory Workshop*, Haifa, Israel.

1996 *International Conference on Image Processing*, Lausanne, Switzerland

1996 INRIA, Rocquencourt, France.

1997 *DIMACS Workshop on Probabilistic Analysis of Algorithms*, New Jerey.

1997 Technical University of Gdansk, Gdansk, Poland.

1997 *Average-Case Analysis Algorithms Seminar*, Dagstuhl, Germany.

1997 University of California at Berkeley.

1997 Stanford University, Palo Alto.

1997 Hewlett-Packard Laboratories, Palo Alto, California.

1998 INRIA, Rocquencourt, France.

1998 Université Paris-Sud, Orsay, France

1998 *Average-Case Analysis Algorithms Seminar*, Princeton.

1998 DIMACS Workshop on Codes and Trees: Algorithmic and Information Theoretic Approaches, Rutgers University, NJ.

1999 Plenary Speaker (1/8) at the *Fifth Seminar on the Mathematical Analysis of Algorithms*, Barcelona, Spain.

1999 INRIA, Rocquencourt, France.

1999 University of California, Berkeley.

1999 Hewlett-Packard Laboratories, Palo Alto, California.

1999 IBM Almaden, San Jose, California.

1999 Stanford University, Palo Alto, California.

1999 University of California, Santa Cruz.

2000 INRIA, Rocquencourt, France.

2000 University of the Witwatersrand, Johannesburg, South Africa.

2000 *The Sixth Seminar on the Analysis of Algorithms*, Gdansk, Poland.

2000 Technical University of Gdansk, Gdansk, Poland.

2001 Florida State University, Tallahassee, FL.

2001 Ecole Polytechnique, France.

2001 University of Washington at St. Louis, St. Louis, MO.

2001 University of Michigan, Ann Arbor, MI.

2001 University of Marne-la-Vallee, Paris, France.

2001 Université Université de Versailles Saint Quentin-en-Yvelines, Versailles, France.

2001 INRIA, Rocquencourt, France.

2001 Ecole Normale Superieure, Paris, France.

2001 Plenary Speaker (1/8) at the *Seventh Seminar on Analysis of Algorithms*, Tatihou, France.

2001 *Internet Process Coordination and Ubiquitous Computing*, Orlando, FL.

2002 *KnuthFest*, Stanford University, Palo Alto, California.

2002 Hewlett-Packard Laboratories, Palo Alto, California.

2002 Ecole polytechnique federale de Lausanne (EPFL), Lausanne, Switzerland.

2002 ULB Louchard Workshop, Brussels, Belgium.

2002 *MSRI Information Theory Workshop*, Berkeley, CA.

2002 Northwestern University, Evanston, IL.

2002 *Eighth Seminar on Analysis of Algorithms*, Strobl, Austria.

2002 50–lecie Wydzialu Elektroniki, Telekomunikacji, i Informatyki, (50th–anniversary of the Department of Electronics at the Technical University of Gdańsk), Gdańsk, Poland.

2002 University of Zurich, Zurich, Switzerland.

2002 *SIAM Conference on Discrete Mathematics*, San Diego, CA.

2002 University of California at San Diego, San Diego, CA.

2003 *NSF/NIH Math-Biology Workshop*, Washington DC.

2003 *Second Workshop on Random Graphs and Randomized Algorithms*, Bertinoro, Italy.

2003 *Ninth Seminar on Analysis of Algorithms*, San Miniato, Italy.

2003 University of California at Santa Barbara, CA.

2003 Hewlett-Packard Laboratories, Palo Alto, California.

2003 IBM Almaden, San Jose, California.

2003 Stanford University, Palo Alto, California.

2003 Université de Bourgone, Dijon, France.

2004 California Institute of Technology, Pasadena, CA.

2004 University of Califronia, Riverside, CA.

2004 Keynote Speaker (1/2) at the *Second Conference on Information Technology*, Gdansk, Poland.

2004 Invited Lecturer of the Analysis of Algorithms Summer Graduate Program) , MSRI, Berkeley, June 2-11, 2004.

2004 *Tenth International Seminar on the Analysis of Algorithms*, MSRI, Berkeley, 2004

2004 *42-d Annual Allerton Conference on Communication, Control, and Computing*, Allerton Park, IL.

2005 Plenary Speaker (1/1) in the *2005 Analytic Algorithmics and Combinatorics* (ANALCO05), Vancouver, January 22, 2005.

2005 Invited Speaker at *2005 Information Theory Workshop*, Rotorua, New Zealand, 2005.

2005 Invited speaker (1/4) at *Ottawa-Carleton Day in Discrete Math Day*, Ottawa, Canada.

2005 McGill University, Montreal.

2005 I2lab Distinguished Seminar Series, University of Central Florida, Orlando,

2005 Invited speaker (1/8), *10th Panhellenic Conference on Informatics*, Volos, Greece.

2006 Invited Speaker, Information Theory and Application Workshop, San Diego.

2006 *Science Prestige Lecture*, University of Canterbury, Christchurch, New Zealand.

2006 Hong Kong University of Science and Technology, Hong Kong.

2006 Jagiellonian University, Krakow, Poland.

2006 MIT, Boston.

2006 University of Pennsylvania, Philadelphia.

2006 Northwestern University, Evanston, IL.

2006 University of California, Riverside, CA.

2006 University of Illinois at Urbana, IL.

2007 Invited Speaker, *Information Theory and Application Workshop*, San Diego, CA.

2007 Princeton University, NJ.

2007 Special Colloquium (1/3), Technical University of Vienna, Vienna, Austria.

2007 Poznan University of technology, Poznan, Poland.

2007 Keynote Speaker (1/4) at *2007 Conference on Analysis of Algorithms*, Juan des Pins, France.

2007 The Istituto di Analisi dei Sistemi ed Informatica "A. Ruberti", Rome, Italy (sposored by Italian Academy of Science).

2007 University of California, San Diego.

2007 Smith Distinguished Lecture at University of California, Irvine.

2007 Keynote Speaker (1/8), *Facets of Entropy*, Copenhagen, Denmark.

2008 Plenary speaker (1/5), *8th Latin American Theoretical Informatics Symposium* (LATIN'08), Rio, Brasil.

2008 Invited Speaker, *Information Theory Workshop*, Porto, Portugal.

2008 Keynote speaker (1/2), *Information Theory and Statistical Learning (ITSL)*, Las Vegas, 2008.

2008 Plenary Speaker (1/5), *Fifth Collquium on Mathematics and Computer Science*, Blaubeuren, Germany.

2008 Invited Speaker (1/2), *Polish-Greman Teletraffic Symposium*, Berlin, 2008

2008 Technical University of Berlin.

2008 *Colloquium for Philippe Flajolet's 60th Birthday*, Paris.

2009 Invited Speaker, Information Theory and Application Workshop, San Diego.

2009 Invited Speaker, *Israel Stringology Workshop*, Israel, 2009.

2009 Invited Speaker, *Genomic Error Correction*, Paris, 2009.

2009 Technical University of Catalonia, Barcelona, Spain.

2010 Invited Speaker, *Information Theory and Application Workshop*, San Diego.

2010 Invited Speaker, Amgen Inc., Thousand Oaks, CA.

2010 Invited Speaker, Technical University of Munich, Munich, Germany.

2010 University of Frankfurt, Germany.

2010 University of Stuttgart, Germany.

2010 Invited Speaker (1/2), Workshop in honor of Prof. Sobczak retirement, Technology University of Gdansk, Gdansk, Poland.

2010 Visiting Fellow, Isaac Newton Institute for Mathematical Sciences Institue, Cambridge, UK.

2010 Kings' College, London, UK.

2010 Invited Tutorial Speaker (1/4), *21st Int. Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms*, Vienna, June 28-July 2, 2010.

2010 Oracle, Redwood Shores, CA.

2010 MIT Theory of Computing Colloquium, Boston, MA.

2011 Invited Speaker, 30th Anniversary of Department of Computer Science & Engineering, University of Southern Florida, Tampa.

2011 Invited Speaker, University Paris 13, Paris, France.

2011 Invited Speaker, *Alignment-free Sequence Comparison*, Venice 2011.

2011 Invited Speaker, Oberwolfach, Germany

2011 Templeton Foundation Mini-Workshop, Edinburgh, Scotland.

2011 Plenary Speaker (1/4) *International Symposium on Information Theory*, St. Petersburg, Russia, 2011.

2011 Distinguished Colloquia Speaker, Concordia, Montreal, Canada

2012 Invited Speaker, *Conference on Information Sciences and Systems*, Princeton.

2012 Gdansk University of Technology, Gdansk, Poland.

2012 MathFest, National Security Agency, Maryland.

2012 Laboratory of Information, Networking, and Communication Sciences (LINCS), Paris, France.

2012 Plenary Speaker (1/6), *Polish Combinatorial Conference*, Bedlewo, Poland.

2012 Jagiellonian University, Cracow, Poland.

2013 University of Hawaii at Manoa, Honolulu.

2013 ETH, Zurich, Switzerland.

2013 Invited Speaker, *Information, Instability,and Fragility in Networks*, Boulder, Colorado.

2014 Indiana University, Bloomington.

2014 MIT, Boston, MA.

2014 Plenary Speaker, WITMSE, Honolulu.

2014 Santa Fe Institute, Santa Fe, NM.

2014 Helsinki Distinguished Lecture Series on Future Information Technology, Helsinki, 2014.

2015 Invited Speaker, Workshop on Combinatorial Probability (Svante Janson 60th Birthday workshop), Stokholm, Sweden, 2015.

2015 Invited Speaker, IS4IS Summit Vienna, Austria

2015 Keynote Speaker (1/3), *Combinatorial Pattern Matching* Conference, Ischia Island, Italy, 2015.

2015 Arden L. Bement Jr. Distinguished Lecture, Purdue University

2015 Guest Lecture, Random Graphs and Brain, Sao Paulo, Brazil

2016 Keynote Speaker (1/5) at *27th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms, AofA'2016*, Krakow, Poland.

2016 Invited Speaker, *AxA Workshop: Advanced Algorithms on Strings*, Venice, Italy.

2016 Plenary Speaker (1/3), WITMSE, Helsinki, Finland.

2016 ETH, Zurich, Switzerland.

2017 Guest Lecture, Random Graphs and Brain, Sao Paulo, Brazil.

2018 Invited Speaker, *Knuth80: Algorithms, Cominatorics, Information*, Piteaa, Sweden.

2018 Distinguished Lecture, Lancaster University, UK.

2018 Distinguished Talk, *3rd Annual Information Modeling, Analysis, and Control of Complex Systems* (IMaCCS), Ohio State University, Columbus, Ohio.

2018 ETH Distinguished Colloquia, Zurich, Switzerland.

2018 Distinguished Speaker, Texas A& M, College Station, TX.

2019 Plenary Speaker (1/4), SODA, San Diego, 2019.

2019 Plenary Speaker (1/5), *18th International Conference on Artificial Intelligence and Soft Computing* (ICAISC), Zakopane, Poland, 2019.

2019 Invited Speaker, *Mathematical Data Science*, Durnstein, Austria, 2019.

2020 IBM Distinguished Lecture Series, IBM Watson, 2020.

2020 Invited Speaker, First IBM Research Workshop on the Information Lerns, virtual.

2021 Keynote Speaker (1/4), *Intelligent Systems Conference (IntelliSys) 2021*, 2021, Amsterdam.

2021 Invited Speaker, Google's Series "Let's Talk Tech".

2022 Flajolet Lecture (awarded in 2020), AofA, 2022, Philadelphia.

2022 Invited Speaker, *Pathway to the 2023 IHP Program*, San Paolo, Brasil (virtual)

2023 Invited Speaker, *Random Processes in the Brain*, Workshop at Intitut Henri Poincare, 2022, Paris

2023 Invited Speaker, Brasilian Probab. Summer School, Sao Paulo, August 2023.

2024 "Computation, Information, Logic" workshop. Krakow, 2024.

2024 Cambridge University, Cambridge, UK

2026 Frederick L. Hovde Distinguished Lecture, Purdue University, April 2026.

2026 Keynote Speaker, Artificial Intelligence and Machine Learning (AIM-2026), San Francisco, April 2026.

Research Contracts and Grants Received

1986	$3,900	Purdue Research Foundation XL Grant
1987-1989	$103,973	National Science Foundation, Grant NCR-8702115 "Stability Problems in Communication Networks" (with D. Marinescu and V. Rego).
1989-1990	B.F.216,000	North Atlantic Treaty Organization, Collaborative Grant 0057/89 "Design and Analysis of Stable and Optimal Data Structures" (with P. Jacquet, INRIA, France).
1989-1992	$219,973	National Science Foundation, Grant CCR-8900305 "Algorithmic and Combinatorial Problems on Words" (with A. Apostolico).
1989-1992	$361,600	National Institute of Health, Grant R01 LM05118 "Algorithms for Macromolecular Structure Analysis" (with A. Apostolico, M. Atallah, P. Gilham and H.L. Weith).
1990-1992	$9,332	National Science Foundation, Grant INT-8912631 "Analysis of Data Structures for Digital Search" (with P. Kirschenhofer and H. Prodinger, Technical University of Vienna, Austria).
1990-1993	$265,217	Air Force Office of Scientific Research, Grant AFOSR-90-0107 "Efficient Algorithmic Techniques for Combinatorial Problems" (with A. Apostolico and A. Atallah).
1990-1991	B.F.147,000	North Atlantic Treaty Organization, Collaborative Grant 0057/89/Renewal "Design and Analysis of Stable and Optimal Data Structures (Renewal)" (with P. Jacquet, INRIA, France).
1992-1993	$13,326	Amendment to NSF Grant CCR-8900305 (REU Supplement, and Supplement for US Participants/1991 Summer School of the Fibonacci Institute).

1991-1993	B.F.187,000	North Atlantic Treaty Organization, Collaborative Grant 0057/89/Renewal "Design and Analysis of Stable and Optimal Data Structures (Secon Renewal)" (with P. Jacquet, INRIA, France)
1992-1995	$253,946	National Science Foundation, Grant NCR-9206315, "Stability Considerations for Networks".
1992-1994	$286,266	National Science Foundation, Grant CCR-9201078, "Algorithmic and Combinatorial Tools for Sequence Analysis" (with A. Apostolico).
1995-1997	B.F.180,000	North Atlantic Treaty Organization, Collaborative Grant CRG.950060 "Data Compression Based on (Approximate) Pattern Matching", (with P. Jacquet and M. Regnier, INRIA, France).
1995-2000	$284,000	National Science Foundation, Grant NCR-9415491, "Data Compression from the String Matching Perspective: Second Order Properties".
1997-1999	B.F.210,000	North Atlantic Treaty Organization, Collaborative Grant CRG.950060/Renewal "Data Compression Based on (Approximate) Pattern Matching", (with P. Jacquet and M. Regnier, INRIA, France).
1998-1999	$12,635	Purdue Research Foundation – SIRG 690/1398-2842-SIRG "Multimedia Data Compression Based on Approximate Pattern Matching" (with A. Grama and K. Park).
1998-2001	$295,000	National Science Foundation, Grant NCR-9804760, "Towards Analytic Information Theory: Data Compression, Predication and Universal Coding Through Analytic Methods"
1999-2000	$10,000	Purdue Global Initiative Faculty Grant "Towards Analytic Information Theory" (with I. Kontoyiannis).
1999-2000	$25,500	National Science Foundation, Grant CCR-9901835, "1999 IEEE Information Theory and Communication Workshop and 1999 Information Theory and Networking Workshop" (with Shu Lin, Hawaii University).
1999-2004	$2,200,000	, National Science Foundation, Grant EIA-9972883, "MSI: A Research Infrastructure for Integrated Quality of Service Management in Multimedia Computing Environments', as an asscociate researcher.
2000-2002	$50,000	Sponsors of CERIAS at Purdue University, Grant No. 1419991431A, "Finding Reliable Threshold for Intrusion Detection".

2001-2003 HK$387,248 Hong Kong Earmarked Research Grant No. PolyU 5146/01E, "Towards a General Approach to Prequeue Stability Problems with Applications in Wireless Communications", (with R. K. C. Chang, HKPolyU).

2002-2005 $215,000 National Science Foundation, CCR-0208709, "Analytic Information Theory, Combinatorics, and Algorithmics: The Precise Redundancy and Related Problems".

2002-2004 $80,000 National Security Agency, "Exact and Asymptotic Solutions to Probabilistic Problems on Sequences" (with C. Knessl as a co-PI-consultant).

2002-2003 $10,000 Sponsors of CERIAS at Purdue University, "Algorithms and Software for Accurate and Complete Intrusion Detection Systems" (with A. Grama).

2003-2004 $40,000 National Science Foundation, CCR-0321451, "Information Theory and Computer Science Interface".

2003-2007 $1,087,500 National Institute of Health, R01 GM068959-01, "Algebraic, Combinatorial, and Probabilistic Methods for Biological Sequences" (with A. Grama and S. Subramaniam).

2004-2005 $10,000 National Security Agency, "Tenth Seminar on Analysis of Algrothms" (with G. Seroussi).

2004-2006 $32,000 Air Force Office of Scientific Research, Grant FA8655-04-1-3074 "User Misbehaviour in Distributed Computer Systems and Networks" (with J. Konorski and J. Wozniak; as a consultant).

2005-2008 $241,000 National Science Foundation, CCF-0513636, "Crossroads of Information Theory and Computer Science: Analytic Algorithmics, Combinatorics, and Information Theory".

2005-2008 $125,000 National Science Foundation, DMS-0503742, "Collaborative Research: Nonlinear Equations Arising in Information Theory and Computer Sciences".

2007-2008 $15,000 Purdue Research Foundation, "Information Transfer in Wireless Systems".

2007-2009 $140,000 National Security Agency, "Asymptotic Solutions to Some Functional Equations Arising in Computer Science" (with C. Knessl).

2008-2014 $500,000 National Science Foundation, DMS-0800568, "Information Flow in Biological Systems" (with A. Grama and D. Kihara).

2008-2011	ϵ210000	EU Project No. 224218, "Optimization driven Multi-hop Network Design and Experimentation", Collaborative Grant"
2008-2011	$300,000	National Science Foundation, CCF -0830140, "Collaborative Research: Information Theory of Data Structures".
2010-2011	zl 400000	MNSW 1967/B/T02/2009/37, "Teorioinformacyjna analiza struktur semantycznych stosowanych w rekomendacji kolaboratywnej", Collaborative Grant.
2010-2015	$25,000,000	National Science Foundation, PI, No. 0939370, Science and Technology Center "Emerging Frontiers of Science of Information" (co-PI's A. Goldsmith, M. Sudan, S. Verdu and Bin Yu).
2010-2013	$100,000	National Security Agency, "Asymptotic Solutions to Recurrences and Functional Equations Arising in Computer Science"
2014-2016	$640,000	National Science Foundation, PI, No. 0939370, Science and Technology Center "Supplement Request for STC Graduate Student/Post Doc Career Development Workshops" of "Emerging Frontiers of Science of Information" (co-PI's A. Goldsmith, M. Sudan, S. Verdu and Bin Yu).
2014-2015	$40,000	National Security Agency, "Asymptotic Solutions to Multi-Dimensional and Non-Linear Recurrences Arising in Computer Science and Information Theory"
2015-2018	$1500,000	National Institute of Health, BDK U01CA198941 "Theoretical Foundations and Software Infrastructure for Biological Network Databases" (co-PIs: M. Koyoturk, A. Grama, S. Subramaniam).
2015-2020	$23,500,000	National Science Foundation, PI, No. 1446382, Science and Technology Center "Emerging Frontiers of Science of Information" (co-PI's A. Goldsmith, M. Sudan, S. Verdu and Bin Yu).
2015-2018	$500,000	National Science Foundation, PI, CIF 1524312, "Towards Structural Information"
2020-2024	$500,000	National Science Foundation, PI, CCF-2006440: "CIF: Small: Towards Information Content of Dynamic Structures"
2020-2024	$500,000	National Science Foundation, PI, CCF-2008125 + CCF-2007238: "Collaborative Research: CIF: Small: Coded String Reconstruction Problems in Molecular Storage" (co PI O. Milenkovic. UIUC)

2020-	$60,000	Google Research Award
2021-	$50,000	Google Research Award
2022-2025	$1,200,000	National Science Foundation, PI, CCF-2211423: "CIF: Medium: Learning From Classical and Quantum Data: a Fourier" (co PI A. Grama and M. Heidari)

TEACHING

At Purdue University

CS 182 Foundation of Computer Science
CS 251 Data Structures
CS 381 Introduction to the Analysis of Algorithms
CS 402 Computer Architecture
CS 430 Data Structures
CS 481 Introduction to the Analysis of Algorithms
CS 520 Computational Methods in Analysis
CS 543 Discrete System Simulation
CS 544 Simulation and Modeling of Computer Systems
CS 590S Analysis of Algorithms on Sequences
CS 590R Randomized and Probabilistic Algorithms
CS 590A Probabilistic Methods in Computer Science
CS 690 Introduction to Applied Combinatorics

At McGill University

CS 203 Data Structures
CS615A Computer Methods in System Analysis I
CS615B Computer Methods in System Analysis II

At Technical University of Gdansk:

Computer Networks
Principles of Modern Communication
Performance Evaluation

Ph.D. and M.S. Students

Bonita Rais "Analysis of Some Trie Parameters Under Probabilistic Models" May 1992 (Assistant Professor at Ball State University, Munci, IN; currently at Saint Norbert College, De Pere, WI).

Jing Tang, "Probabilistic Analysis of Digital Search Trees", (Department of Mathematics), February 1996 (currently self-employed).

Wen Hui Ren, M.S. "An Optimal DNA Segmentation Based on the MDL Principle", 2004.

Mark Ward, (Dept. Mathematics), "Analysis of an Error Resilent Lemepl-Ziv Algorithm via Suffix Trees", March 30, 2005 (University of Pensylvania; currently at Purdue, Dept. Statistics.).

Robert Gwadera(co advisor M. Atallah), "Reliable Identification of Significant Episodes in Event Sequences", May 23, 2005 (IBM Zurich, Switzerland).

Gahyun Park, "Profile of Tries", January 2006 (University of Wisconsin, Whitewater, WI; currently at State University of New York, Genesco).

Mehmet Koyuturk, (co-advisor), "Comparative analysis of molecular interaction networks", August 2006 (Case Western Reserve University, Cleveland, OH).

Y-W. Choi, "Structural Information in Strings and Graphs", May 2010 (J. Craig Venter Institute, MA).

Abram Magner, "Profile of PATRICIA Tries", 2015 (postdoc, UIUC).

Shahin Mohammadi (jointly with A. Grama), " Cell Type-Specific Analysis of Human Interactome and Transcriptome", 2016.

Graduate Seminar.

1. In 2002 I initiated a graduate seminar called "Curious Minds" with about 10-15 graduate students (cf. `http://www.cs.purdue.edu/homes/spa/cm-schedule.html`).

2. In 2006 I started a new *Prestige Lecture Series on Science of Information* (cf. `http://www.cs.purdue.edu/homes/spa/info.html`).

Recent Ph.D. Defense

At Purdue, I have been participating every year in several Ph.D defenses (not listed here). Outside Purdue, I have recently been on the following Ph.D. defenses:

1. Julien Clement, "Arbres Digitaux et Sources Dynamiques", September 2000, Université de Caen, France (*Rapporteur de thése*).

2. Cedric Adjih, "Multimédia et accés á l'Internet haut dbit: la filiére du cáble", June 2001, Université de Versailles Saint Quentin-en-Yvelines, France (*Président du jury*).

3. J'er'emie Bourdon, " Analyse dynamique d'algorithmes: Examples en arithm'etique et en th'eorie de l'information", December 2002, Université de Caen, France (*Rapporteur de thése*).

4. Costas Christophi, "The oscillatory distribution of distances in random tries", George Washington University, Washington, 2004.

5. Julien Fayolle, "Compression de données sans perte et combinatoire analytique", Université de Versailles, INRIA, France, 2006.

6. Georgios Rodolakis, "Analytical Models and Performance Evaluation in Massive Mobile Ad Hoc Networks", Ecole Polytechnique, 2006.

Some Recent Undergraduate Students (working at least 3 months with me):

Yann Génin (1994,1995), Ecole Polytechnique, France (*Data Compression*)

Yannick Lallement (1995), Nancy University, France (*Parallel Computing*)

Denis Arnaud (1996), Ecole Polytechnique, France (*Predictive Image Compression*)

Marc Alzina (1998), Ecole Polytechnique, France (*2D Video Compression*)

David Meyer (2000), Purdue University(*Streaming Video Using Mobile Code*)

Sacha Zyto (2000), Ecole Polytechnique, France (*Image Compression using SDD*)

Christophe Levesque (2001), Ecole Polytechnique, France (*Video Compression*)

Darren Zollman (2001), Purdue University (*Streaming Video Decompression*)

Kalid Hilal (2001), Purdue University (*Intrusion Detection*)

Heechang Yang (2001), Purdue University (*Computational Information Theory*)

Sumi Kamara (2001), Purdue University (*Qunatum Information Theory*)

Suk Jin Sohn (2002), Purdue University (*Compression of Microarrays*)

Quang Thai (2002), Ecole Polytechnique, France (*Extreme Video Compression*)

J. Lee (2002), Purdue University (*Retrieving Noisy Data*)

List of Collaborators: David Aldous (Berkeley), Cedric Adjih (INRIA, France), Marc Alzina (Ecole Polytechnique, France), Izydor Apostol (Amgen Inc.), Alberto Apostolico (Purdue), Mikhail Atallah (Purdue), Luc Devroye (McGill, Montreal), Michael Drmota (U. Wien, Austria), Jim Fill (Johns Hopkins), Philippe Flajolet (INRIA, France), Alan Frieze (CMU, Pittsburgh), Ioannis Fudos (U. of Ioannina, Greece), Yann Genin (Ecole Polytechnique), Leonidas Georgiadis (U. Thessalonki, Greece), Ananth Grama (Purdue), Yves Guivarc'h (U. Rennes, France), Micha Hofri (WPI), Svante Janson (Uppsala U, Sweden), Philippe Jacquet (INRIA, France), John Kieffer (U. Minnesota), Peter Kirschenhofer (U. Wien, Austria), Chuck Knessl (U. Illinois, Chicago), I. Kontoyiannis (Athens, Greece), Jerzy Konorski (Poland), Mehmet Koyuturk (Case Western Reserve U.), Andrzej Kusiuk (TU Gdansk, Poland), Guy Louchard (U. Libre de Bruxelles, Belgium), Tomasz Łuczak (Polish Academy of Science), Gabor Lugosi (Barcelona), Hosam Mahmoud (The George Washington U.), Dan Marinescu (Purdue), P. Nicodeme (INRIA, France), K. Ono (KDD Tokyo), Krzysztof Pawlikowski (New Zealnd), Evaggelia Pitoura (U. of Ioannina, Greece), Helmut Prodinger (U. Witswatersland, South Africa), Bonita Rais (Purdue), Vernon Rego (Purdue), Mireille Régnier (INRIA), Yuri Reznik (RealNetworks Inc.), John Sadowsky (Purdue), Serap Savari (Bell Labs.), Gadiel Seroussi (MSRI), Valeri Stefanov (Australia), Shankar Subramaniam (UCSD), Erkki Sutinen (U. of Helsinki, Finland), Jing Tang (Purdue), and Leandros Tassiulas (U, Maryland), Y. Urano (KDD Tokyo), Brigitte Vallée (U. Caen, France), Sach Zyto (Ecole Polytechnique).

SERVICE

Department

1986-1987 Coordinator for CS 690S course
1988-1992 Graduate Commitee
1993-1994 Graduate Commitee
1995-1997 Chair of the Personnel Committee
1995-1996 Head Search Committee (elected)
2000-2001 Coordinator for CS 690S course
2001-2002 Member of the Personnel Committee
2001-2002 Head Search Committee (elected)
2004-2005 CS Bioinformatics Search Committee (chair)
2005-2007 CS Bioinformatics Search Committee
2006-2007 *Prestige Lecture Series on Science of Information* (founder and chair)
2006-2007 Chair of the Head Search Committee (elected)
2007-2009 Executive Committee (elected).
2009-2010 Strategic Planning Committee.
2010-2012 Personnel Committee
2020-2023 Graduate Committee.

University

1991-1992 Student Cases
2000-2001 Mathematics Undergraduate Committee
2003-2005 Patent and Copyright Committee (recommended by the President)
2011-2012 CISET Task Force
2016-2017 Dean Search Committee.

Elected to:

1994-1997 Purdue Senate
1995-1997 University Senate Nominating Committee
1999-2001 School of Science Grievance Hearing Committee
2002-2004 School of Science Faculty Council