

## Dennis E. Shasha – Curriculum Vitae

### Education

- 1984 Ph.D. Harvard University in applied mathematics  
Dissertation Advisor: N. Goodman
- 1980 M.Sc. Syracuse University (overlapped work at IBM Data Systems Division)
- 1977 B.Sc. Yale University

### Academic Positions

- 1995– Professor of Computer Science  
Courant Institute of Mathematical Sciences  
New York University  
251 Mercer Street, New York, New York 10012  
telephone: 212-998-3086, email: shasha@cs.nyu.edu, fax: 212-995-4123  
web: <http://cs.nyu.edu/cs/faculty/shasha/index.html>
- 1990–1995 Associate Professor of Computer Science  
Courant Institute of Mathematical Sciences  
New York University
- 1984–1990 Assistant Professor of Computer Science  
Courant Institute of Mathematical Sciences  
New York University
- 1998-1999 Invited Professor at INRIA  
Projet Caravelle  
Roquencourt, France

### Industrial Positions

- 1991– Database tuning and design consulting  
Wall Street investment banks, Internet gaming, and biotech.  
Primary clients: Morgan-Stanley, Interactive Imaginations, and  
Union Bank of Switzerland. Also TRW, NCR, Bull, Bellcore, and  
the RATP (Paris rapid transit). Lastminute.com. Relational systems mainly.
- 1995–2000 Database Research Collaboration  
Lucent Bell Laboratories and Bell Communication Research
- 1987–1995 AT&T Bell Laboratories, Unix System Laboratories, and Novell

Consulting work on transaction processing (concurrency control and recovery) and future UNIX kernel development.

1977–1980 IBM Data Systems Division  
Hardware and microcode design of arithmetic, interrupt, and processor-to-channel communication for the IBM 3090 central processor. Also responsible for self-diagnosing circuit design. Three invention disclosures.

#### Pro Bono

1987–1991 Ellis Island Restoration Commission  
Technical consultant (pro bono work) for the design of the Immigrant Database Management System.

2003– Distinguished Science Advisor, New York Hall of Science  
one of 20, including James D. Watson, Benoit Mandelbrot, and Rosalyn Yalow

2003– International School on Biomedicine and Bioinformatics  
Steering Committee

#### Doctoral Students Supervised

1. Kaizhong Zhang, (1989; pattern recognition)  
*The Editing Distance Between Trees: algorithms and applications*  
Current Position: Full Professor of Computer Science at the University of Western Ontario (with tenure).
2. Theodore Johnson (1990; performance analysis)  
*The Performance of Concurrent Data Structure Algorithms*  
Current Position: Research scientist at ATT Laboratories.
3. Jose Perez-Carballo (1990; text databases)  
*Design and Implementation of HyTeK: a Knowledge-based Hypertext System* Current Position: Assistant Professor at Rutgers.
4. Tsong-Li Wang (1991; database query processing)  
*Query Optimization in Database and Information Retrieval Systems*  
Current Position: Full Professor at the New Jersey Institute of Technology, Newark (with tenure).
5. Vladimir Lanin (1991; concurrent data structures)  
*Semantically-based Concurrent Data Structure Algorithms* Current Position: member of technical staff at Google, Israel.
6. Brian Anderson (1991; parallel transaction-based processing)

*Persistent LINDA: design and implementation of a system to add transactions to LINDA* Current Position: Chief Technical Officer, Consilient.

7. John Turek (1991; robust concurrent computation)  
*Algorithms for robust parallel computation.* Current Position: Department Group Manager, next generation Web. IBM T. J. Watson Research Center.
8. Steve Rozen (1993: data structure selection for database systems),  
*Automating Physical Database Design: An Extensible Approach* Current Position: Professor at Duke-National University of Singapore Graduate Medical School
9. Gilad Koren (1993: real time scheduling),  
*Competitive On-Line Scheduling for Overloaded Real-Time Systems* Current Position: Professor at Natanyu College in Israel.
10. Karpjoo Jeong (1995: robust parallel computation),  
(1995, *PLinda 2.0: Fault Tolerant Parallel Computation on Idle Workstations*) Current Position: Assistant Professor  
Department of Computer Science and Engineering  
Konkuk University  
Mojin-Dong 93-1, Kwangjin-Ku  
Seoul 133-701, Korea
11. Bin Li (1998: parallel data mining on networks of workstations),  
(1998, *Free Parallel Data Mining* Current Position: Vice President  
Citibank  
New York, New York.
12. Peter Wyckoff (1998: parallel fault tolerance),  
(1998, *Fault Tolerant Parallel Computing on Networks of Non-Dedicated Workstations*  
Current Position: Data warehousing group at facebook.com
13. Peter Piatko (1998: complex document presentation and management)  
(1998, *Thinksheet: a tool for information navigation*  
Current Position: Research Scientist at SIAC Research.
14. David Tanzer(2000: efficient querying of Thinksheet expert systems)  
(2000, *Queryable Expert Systems*  
Current Position: Wall Street mathematical programmer.
15. Rosalba Giugno (2003)  
*Searching Algorithms and Data Structures for Combinatorial, Temporal and Probabilistic Databases* Assistant Professor, University of Catania.

16. Alberto Lerner (2003)  
*Querying Ordered Data with AQuery* Technical staff, Google, Inc.
17. Yunyue Zhu (2003)  
*High Performance Discovery in Time Series: techniques and case studies*  
Trading system builder in finance.
18. Aristotle Tsirigos (2005)  
*Pattern Discovery for Hypothesis Generation in Biology* Current position:  
Researcher at IBM.
19. Xiaojian Zhao (2006)  
*High Performance Algorithms for Multiple Streaming Time Series* Current  
position: finance
20. Zhihua Wang (2006)  
*Time Series Matching: a Multi-filter Approach* Current position: finance
21. Tyler Neylon (2006)  
*Sparse Solutions for Linear Prediction Problems* Current position: founder  
of start-up
22. Xin Zhang (2006)  
*Fast Algorithms for Burst Detection* Current position: finance
23. Chris Poultney (2010)  
*Structure Prediction and Visualization in Molecular Biology* Current po-  
sition: post-doc in bioinformatics at NYU
24. Huang-Wen Chen (2010)  
*Machine Learning Approaches to Gene Duplication and Transcription Reg-  
ulation* Current position: post-doc in bioinformatics at Franklin Medical  
School

## Publications

This list does not include:

1. submissions,
2. technical reports superseded by publications

## Journal Publications

1. “Nitrogen economics of root foraging: Transitive closure of the nitrate-cytokinin relay and distinct systemic signaling for N supply vs. demand.” Sandrine Ruffel, Gabriel Krouk, Daniel Ristova, Dennis Shasha, Kenneth Birnbaum, and Gloria Coruzzi, Proc U.S. National Academy of Science November 8, 2011

2. "Rational design of temperature-sensitive alleles using computational structure prediction." Christopher S. Poultney, Glenn L. Butterfoss, Michelle R. Gutwein, Kevin Drew, David Gresham, Kristin C. Gunsalus, Dennis E. Shasha, Richard Bonneau. PLoS ONE 6(9): e23947. doi:10.1371/journal.pone.0023947
3. "The proteome folding project: proteome-scale prediction of structure and function" Kevin Drew, Patrick Winters, Glenn L. Butterfoss, Viktor Berstis, Keith Uplinger, Jonathan Armstrong, Michael Riffle, Eric Schweighofer, Bill Braverman, David R. Goodlett, Trisha N. Davis, Dennis Shasha, Lars Malmstrom, and Richard Bonneau August 8, 2011, doi: 10.1101/gr.121475.111 Genome Res. 2011.
4. "Predictive network modeling of the high-resolution dynamic plant transcriptome in response to nitrate," Gabriel Krouk, Piotr Mirowski, Yann LeCun, Dennis E Shasha and Gloria M Coruzzi Genome Biology 2010, 11:R123 doi:10.1186/gb-2010-11-12-r123 Published: 23 December 2010
5. "Estimation of genome-wide redundancy in Arabidopsis thaliana," Huang-Wen Chen, Sunayan Bandyopadhyay, Dennis E. Shasha, and Kenneth D. Birnbaum accepted, BMC Evolutionary Biology 2010, 10:357; doi:10.1186/1471-2148-10-357
6. "Fast Elastic Peak Detection for Mass Spectrometry Data Mining," X. Zhang, D. Shasha, Y. Song and J. T. L. Wang, IEEE Transactions on Knowledge and Data Engineering, Issue 99. November 29, 2010, doi: 10.1109/TKDE.2010.238
7. "SING: Subgraph search In Non-homogeneous Graphs" Raffaele Di Natale , Alfredo Ferro , Rosalba Giugno , Misael Mongiovi , Alfredo Pulvirenti and Dennis Shasha BMC Bioinformatics 2010, 11:96doi:10.1186/1471-2105-11-96 <http://www.biomedcentral.com/1471-2105/11/96>
8. "VirtualPlant: a software platform to support system biology research" Manpreet S. Katari, Steve D. Nowicki, Felipe F. Aceituno, Damion Nero, Jonathan Kelfer, Lee Parnell Thompson, Juan M. Cabello, Rebecca S. Davidson, Arthur P. Goldberg, Dennis E. Shasha, Gloria M. Coruzzi, and Rodrigo A. Gutierrez, Plant Physiology 152:500-515 (2010)
9. "miRo: a miRNA knowledge base" A. Lagana, S. Forte, A. Giudice, M. R. Arena, P. L. Puglisi, R. Giugno, A. Pulvirenti, D. Shasha, A. Ferro Database: The Journal of Biological Databases and Curation, Oxford University Press, 2009 doi: 10.1093/database/bap008
10. "A Systems Approach Uncovers Restrictions for Signal Interactions Regulating Genome-wide Responses to Nutritional Cues in Arabidopsis" Gabriel Krouk, Daniel Tranchina, Laurence Lejay, Alexis A. Cruikshank, Dennis

Shasha, Gloria M. Coruzzi, Rodrigo A. Gutierrez PLOS Computational Biology March 2009, volume 5, issue 3

11. "GraphClust: A Method for Clustering Databases of Graphs" Diego Rerforgiato, Rodrigo Gutierrez, Dennis Shasha Journal of Information and Knowledge Management (JIKM) Volume: 7, Issue: 4 (December 2008) Page 231 - 241 <http://www.worldscinet.com/cgi-bin/details.cgi?id=jsname:jikm&type=current>
12. "Revelation on Demand", Nicolas Ancaux, Mehdi Benzine, Luc Bouganim, Philippe Pucheral and Dennis Shasha, Distributed and Parallel Databases Journal, vol 25, issue 1-2 (april 2009) pp. 5-28.
13. "DNA Hash Pooling and its Application" Dennis Shasha and Martyn Amos International Journal of Nanotechnology and Molecular Computation 1(1), 18-32, January-March 2009 (Previous version: arXiv:0705.3597)
14. "An integrated genetic, genomic and systems approach defines gene networks regulated by the interaction of light and carbon signaling pathways in Arabidopsis" Karen E Thum, Michael J Shin, Rodrigo Gutierrez, Indrani Mukherjee, Manpreet S Katari, Damion Nero, Dennis Shasha and Gloria M Coruzzi BMC Systems Biology 2008, 2:31 (04 Apr 2008)
15. Gutierrez, R.A., Lejay, L., Chiaromonte, F., Shasha, D.E., Coruzzi, G.M. (2007) "Qualitative network models and genome-wide expression data define carbon/nitrogen-responsive molecular machines in Arabidopsis". Genome Biol.: 8, pp. R7. "Must read" Factor 6 in the Faculty of 1000.
16. "GraphFind: Enhancing Graph Searching by Low Support Data Mining Techniques" A. Ferro, R. Giugno, M. Mongiovi, A. Pulvirenti, D. Skripin, D. Shasha, BMC Bioinformatics, vol. 8 ISSN: 1471-2105, 2007.
17. "Homology search for genes" Xuefeng Cui; Tomas Vinar; Brona Brejova; Dennis Shasha; Ming Li Bioinformatics. 2007 Jul 1;23 (13):i97-i103 17646351 (P,S,E,B,D)
18. "Insights into the genomic nitrate response using genetics and the Sungear software system" Rodrigo A. Gutierrez, Miriam L. Gifford, Chris Poultney, Rongchen Wang, Dennis E. Shasha, Gloria M. Coruzzi and Nigel M. Crawford JXB Advance Access published online on April 29, 2007 Journal of Experimental Botany, doi:10.1093/jxb/erm079
19. A. Ferro, R. Giugno, G. Pigola, A. Pulvirenti, D. Skripin, G. D. Bader, D. Shasha "NetMatch: a Cytoscape Plugin for Searching Biological Networks" Bioinformatics, 2007 23(7):910-912; doi:10.1093/bioinformatics/btm032
20. Christopher S. Poultney, Rodrigo A. Gutierrez, Manpreet S. Katari, Miriam L. Gifford, W. Bradford Paley, Gloria M. Coruzzi and Dennis E. Shasha

- "Sungear: Interactive visualization and functional analysis of genomic datasets" *Bioinformatics*, 2007; Jan 15;23(2):259-61 doi: 10.1093/bioinformatics/btl496
21. Charles J. Colbourn, Sosina S. Martirosyan, Gary L. Mullen, Dennis Shasha, George B. Sherwood, Joseph L. Yucas "Products of Mixed Covering Arrays of Strength Two" *Journal of Combinatorial Designs* Volume 14, Issue 2, Date: March 2006, Pages: 124-138
  22. Jason T. L. Wang, Huiyuan Shan, Dennis Shasha and William H. Piel, "Fast Structural Search in Phylogenetic Databases," *Evolutionary Bioinformatics Online*, Vol. 1, October 2005, pp. 37-46.
  23. Michael Rabin and Dennis Shasha "Preventing Piracy while Preserving Privacy" *Dr. Dobb's Journal*, October 2005.
  24. Rodrigo Gutierrez, Dennis Shasha, and Gloria Coruzzi, "Systems Biology for the Virtual Plant" *Plant Physiology*, June 2005, vol. 38, pp. 550-554.
  25. J. T. L. Wang, X. Wang, D. Shasha and K. Zhang, "MetricMap: An Embedding Technique for Processing Distance-Based Queries in Metric Spaces," *IEEE Transactions on Systems, Man and Cybernetics, Part B, Cybernetics*, Vol. 35, No. 5, October 2005, pp. 973-987.
  26. "Making Snapshot Isolation Serializable" Alan Fekete, Dimitrios Liarokapis, Elizabeth O'Neil, Patrick O'Neil, Dennis Shasha *ACM TODS*, June 2005 vol. 30, number 2. pp. 492-528
  27. "In Vitro and In Silico Cloning of *Xenopus laevis* SOD2 cDNA and its Phylogenetic Analysis" Michele Purrello, Cinzia di Pietro, Marco Ragusa, Alfredo Pulvirenti, Rosalba Giugno, Valetina di Pietro, Giovanni Emanuele, Salvo Travali, Marina Scia, Dennis Shasha, and Alfredo Ferro. *DNA and Cell Biology*, volume 24, number 2, 2005, pp. 111-116.
  28. "Antipole Tree Indexing to Support Range Search and K-Nearest Neighbor Search in Metric Spaces" Domenico Cantone, Alfredo Ferro, Alfredo Pulvirenti, Diego Reforgiata, Dennis Shasha *IEEE Transactions on Knowledge and Data Engineering*, vol. 17, no. 5 (April 2005), pp. 535-550.
  29. "Database Systems" Dennis E. Shasha and Philippe Bonnet in special issue of *Dr. Dobb's Journal on Database Development* December 2004.
  30. "Adaptive Combinatorial Design to explore Large Experimental Spaces: approach and validation" Laurence V. Lejay, Dennis E. Shasha, Peter M. Palenchar, Andrei Y. Kouranov, Alexis A. Cruikshank, Michael F. Chou, Gloria M. Coruzzi *Systems Biology*, volume 1, issue 2, December 2004, pp. 206-212.

31. "Fast structural search in phylogenetic databases" Jason Wang, Shan, Dennis Shasha, William Piel Applied Bioinformatics, to appear.
32. "A gene expression map of the Arabidopsis root" Kenneth Birnbaum, Dennis E. Shasha, Jean Y. Wang, Jee W. Jung, Georgina M. Lambert, David W. Galbraith, and Philip N. Benfey Science, Dec 12 2003: 1956-1960 (A review article in the Research Focus section of Trends in Biotechnology called the article "At the end of 2003, the root biology community was blessed with what has become today already a historical paper that described for the first time a genome wide expression analysis of Arabidopsis root development [2].")
33. Dennis Shasha "Plant Systems Biology: Lessons from a Fruitful Collaboration" Plant Physiology, June 2003, Vol 132, pp. 1-2.
34. Alfredo Ferro, G. Pigola, Alfredo Pulvirenti, Dennis Shasha: "Fast Clustering and Minimum Weight Matching Algorithms for Very Large Mobile Backbone Wireless Networks." Int. J. Found. Comput. Sci. 14(2): 223-236 (2003)
35. Mitchell Levesque, Dennis Shasha, Wook Kim, Michael G. Surette, and Philip N. Benfey "Trait-To-Gene: A Computational Method for Predicting the Function of Uncharacterized Genes" *Current Biology*, vol. 13, 129-133, January 21, 2003. Discussed in: [http://www.the-scientist.com/yr2003/jun/hot\\_030603.html](http://www.the-scientist.com/yr2003/jun/hot_030603.html)
36. Qicheng Ma, Jason T. L. Wang, Dennis Shasha and Cathy H. Wu, "DNA Sequence Classification via an Expectation Maximization Algorithm and Neural Networks: A Case Study," *IEEE Transactions on Systems, Man, and Cybernetics*, Special Issue on Knowledge Management, invited, to appear.
37. "Using Combinatorial Design to Study Regulation by Multiple Input Signals. A Tool for Parsimony in the Post-Genomics Era" Dennis Shasha, Andrei Kouranov, Laurence Lejay, Michael Chou, and Gloria Coruzzi, *Plant Physiology*, Dec. 2001 127(4):1590-1594.
38. "cis Element/Transcription Factor Analysis (cis/TF): A Method for Discovering Transcription Factor/cis Element Relationships" Kenneth Birnbaum, Philip N. Benfey, and Dennis E. Shasha *Genome Res.* 2001 11: 1567-1573.
39. Munir Cochinwala, Verghese Kurien, Gail Lalk, and Dennis Shasha "Efficient data reconciliation" *Information Sciences* 137, (2001), pp. 1-15
40. J. T. L. Wang, Q. Ma, D. Shasha and C. H. Wu, "New Techniques for Extracting Features from Protein Sequences," *IBM Systems Journal*, Special Issue on Deep Computing for the Life Sciences, invited, Vol. 40, No. 2,

2001, pp. 426-441 (accessible at <http://www.research.ibm.com/journal/sj40-2.html>)

41. "Finding Patterns in Three Dimensional Graphs: Algorithms and Applications to Scientific Data Mining" Xiong Wang, Jason T-L Wang, Dennis Shasha, Bruce Shapiro, Isidore Rigoutsos, and Kaizhong Zhang *IEEE Transactions on Knowledge and Data Engineering*, pp. 731-749, 2002.
42. "An Index Structure for Data Mining and Clustering" by Xiong Wang, Jason T.L. Wang, King-Ip Lin, Dennis Shasha, Bruce A. Shapiro, and Kaizhong Zhang *Knowledge and Information Systems: An International Journal* ISSN 0219-1377 by Springer-Verlag Volume 2, Number 2 (May 2000) pp. 161-184
43. "New Techniques for DNA Sequence Classification," Jason T. L. Wang, Steve Rozen, Bruce A. Shapiro, Dennis Shasha, Zhiyuan Wang and Maisheng Yin, *Journal of Computational Biology*, Vol. 6, No. 2, 1999, pp. 209-218.
44. Dennis Shasha "Tuning Time Series Queries in Finance: case studies and recommendations" *IEEE Data Engineering Bulletin* July, 1999. Special issue on Performance Tuning for Database Systems, edited by Surajit Chaudhuri. (invited by the editor)
45. K. Jacob and Dennis Shasha "FinTime — a financial time series benchmark" *Sigmod Record*, December, 1999
46. J. T. L. Wang, B. A. Shapiro, Dennis Shasha, K. Zhang and K. M. Currey, "An Algorithm for Finding the Largest Approximately Common Substructures of Two Trees," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 20, No. 8, August 1998, pp. 889-895.
47. "Tuning Databases for High Performance" *ACM Computing Surveys*, Vol. 28, no. 1, March 1996, pp. 113-115 Dennis Shasha
48. J. T. L. Wang, T. G. Marr, Dennis Shasha, B. A. Shapiro, G.-W. Chirn and T. Y. Lee, "Complementary Classification Approaches for Protein Sequences," *Protein Engineering*, Vol. 9, No. 5, May 1996, pp. 381-386.
49. "On the Editing Distance between Undirected Acyclic Graphs," *International Journal of Foundations of Computer Science*, K. Zhang, J. T. L. Wang and Dennis Shasha, Special Issue on Computational Biology, Vol. 7, No. 1, March 1996, pp. 43-57.
50. "Transaction Chopping: Algorithms and Performance Studies" Dennis Shasha, F. Llirbat, E. Simon, P. Valduriez *ACM Transactions on Database Systems*, October 1995, pp. 325-363.

51. "Discovering Active Motifs in Sets of Related Protein Sequences and Using Them for Classification" Jason T. L. Wang, Thomas G. Marr, Bruce Shapiro, Dennis Shasha and Gung-Wei Chirn *Nucleic Acids Research*, 1994, Vol. 22, No. 14, pp. 2769-2775.
52. "D-Over: An Optimal On-Line Scheduling Algorithm for Overloaded Uniprocessor Real-Time Systems" G. Koren and Dennis Shasha *Siam Journal on Computing*, April 1995, pp. 318-339, vol. 24, no. 2.
53. "MOCA : A Multiprocessor On-Line Competitive Algorithm for Real-Time System Scheduling" G. Koren and Dennis Shasha *Theoretical Computer Science*, Special Issue on Dependable Parallel Computing, issue 128, July 1994, pp. 75-97.
54. "Exact and Approximate Algorithms for Unordered Tree Matching." J. T-L. Wang, K. Zhang, Dennis Shasha, and F. Shih) *IEEE Transactions on Systems, Man and Cybernetics* Vol. 24, No. 4, April 1994, pp. 668-678.
55. "Approximate Tree Matching in the Presence of Variable Length Don't Cares" K. Zhang, T-L. Wang, and Dennis Shasha *Journal of Algorithms*, vol. 16, pp. 33-66 (1994).
56. "A System for Approximate Tree Matching" K. Jeong, T-L. Wang, K. Zhang, Dennis Shasha *IEEE Transactions on Knowledge and Data Engineering*, Vol. 6, No. 4, Aug. 1994, 559-571.
57. "The Performance of Concurrent B-tree Algorithms" T. Johnson and Dennis Shasha *ACM Transactions on Database Systems*, March 1993, pp. 51-101.
58. "Optimizing Database Performance," Dennis Shasha *Dr. Dobb's Journal* (magazine for professional programmers) April 1993, special supplement on tools and techniques for database development, pp. 32s-34s.
59. "Inserts and Deletes on B-trees: why free-at-empty is better than merge-at-half" T. Johnson and Dennis Shasha *Journal of Computer Sciences and Systems*, invited, vol. 47, no. 1, pp. 45-76, Aug. 1993.
60. "On the Editing Distance between Unordered Labeled Trees" K. Zhang, Dennis Shasha, and R. Statman *Information Processing Letters*, vol. 42, pp. 133-139 (1992).
61. "On the Competitiveness of On-Line Real-time Task Scheduling" S. Baruah, G. Koren, D. Mao, B. Mishra, A. Raghunathan, L. Rosier, Dennis Shasha, and F. Wang *Real-Time Systems Journal* invited, Volume 4, Number 2, 125-144, (June 1992)

62. "The Many Faces of Consensus in Distributed Systems" Dennis Shasha and J. Turek *IEEE Computer*, June, 1992, pp. 8-17.
63. "Revisiting B-Trees" T. Johnson and Dennis Shasha, *Dr. Dobb's Journal* (magazine for professional programmers): January 1992, pp. 44-49.
64. "Information Search with Dynamic Text vs. Paper Text: an empirical comparison" S. Gray, C. B. Barber, and Dennis Shasha *International Journal of Man-Machine Studies* vol. 35, pp. 575-586 (1991).
65. "Optimizing Equijoin Queries In Distributed Databases Where Relations Are Hash Partitioned" Dennis Shasha and T-L. Wang *ACM Transactions on Database Systems*, vol. 16, no. 2, pp. 279-308, June 1991.
66. "Fast Algorithms for the Unit Cost Editing Distance Between Trees" Dennis Shasha and K. Zhang *Journal of Algorithms*, vol. 11, pp. 581-621 (1990).
67. "New Techniques for Best Match Retrieval" Dennis Shasha and T-L. Wang *ACM Transactions on Office Information Systems*, vol. 8, no. 2, pp. 140-158, April 1990.
68. "Performance and Architectural Issues for String Matching" M. Isenman and Dennis Shasha *IEEE Transactions on Computers*, vol. 39, no. 2, pp. 238-250, February 1990.
69. "Simple Fast Algorithms for the Editing Distance Between Trees and Related Problems" K. Zhang and Dennis Shasha *Siam Journal of Computing*, vol. 18, no. 6, pp. 1245-1262, December 1989.
70. "Using a Relational Database on Wall Street: the good, the bad, the ugly, and the ideal" S. Rozen and Dennis Shasha, *Communications of the ACM*, vol. 32, no. 8, pp. 988-994, August 1989.
71. "To Link or Not to Link? Empirical Guidance to the Design of Nonlinear Text Systems" S. H. Gray and Dennis Shasha, *Behavior Research: Methods, Instruments, and Computers* vol. 21, no. 2, pp. 326-333, April 1989.
72. "Efficient and Correct Execution of Parallel Programs that Share Memory" Dennis Shasha and M. Snir, *ACM Transactions on Programming Languages, and Systems*, vol. 10, no. 2, pp. 282-312, April, 1988.
73. "Concurrent Search Structure Algorithms" Dennis Shasha and N. Goodman, *ACM Transactions on Database Systems*, vol. 13, no. 1, pp. 53-90, March 1988.

### Journal Puzzle Columns

1. Dr. Dobb's Journal: *Omniheurist Puzzle Corner* April 1998 to September, 2002  
April 2004 to December 2005.
2. Scientific American: *Puzzling Adventures* April 2001 to May 2004 in magazine and on web.  
June 2004 and till June 2009 at [www.sciam.com](http://www.sciam.com).
3. Scientific American: *Parent's Corner* May 2004 and till end of 2004 at [www.sciam.com](http://www.sciam.com).

### Refereed Conference Publications

1. Alex Rubinsteyn, Eric Hielscher, Nathaniel Weinman, Dennis Shasha "Parakeet: a just-in-time parallel accelerator for Python" In Proceedings of the 4th USENIX Conference on Hot Topics in Parallelism (Berkeley, CA, USA, 2012), HotPar'12, USENIX Association.
2. Arthur Meacham and Dennis Shasha "JustMyFriends: Full SQL, Full Transactional Amenities, and Access Privacy" Sigmod 2012
3. Juliana Freire, Philippe Bonnet, and Dennis Shasha "Computational Reproducibility: State-of-the-Art, Challenges, and Database Research Opportunities" Sigmod 2012
4. Juliana Freire, Philippe Bonnet, and Dennis Shasha "Exploring the coming repositories of repeatable experiments: challenges and opportunities" to appear in 2011. Proceedings of the VLDB Endowment. Papers from the International Conference on Very Large Databases (VLDB)
5. Bonnici V, Di Natale R, Ferro A, Giugno R, Mongiovi M, Pigola G, Pulvirenti A, Shasha D, "Enhancing Graph Database Indexing By Suffix Tree Structure" Proc. of ACM 5th IAPR International Conference on Pattern Recognition in Bioinformatic. pp. 195-203 Lecture Notes in Bioinformatics. 22-24 September 2010, Nijmegen, The Netherlands.
6. "The Blind Stone Tablet: Outsourcing Durability" Peter Williams, Radu Sion, Dennis Shasha 16th Annual Network and Distributed System Security Symposium, 2009
7. Christophe Salperwyck, Nicolas AnCIAUX, Mehdi Benzine, Luc Bouganim, Philippe Pucheral, Dennis Shasha: "GhostDB: Hiding Data from Prying Eyes" VLDB 2007: 1346-1349

8. Nicolas Ancaux, Mehdi Benzine, Luc Bouganim, Philippe Pucheral, Dennis Shasha: "GhostDB: querying visible and hidden data without leaks" SIGMOD Conference 2007: 677-688
9. "Homology Search for Genes Using Biased HMMS" Xuefeng Cui, Tomas Vinar, Brona Brejova, Dennis Shasha, Ming Li ISMB/ECCB 2007, to appear
10. "State-Based Clinical Decision Support (SBCDS)" Zebadiah Kimmel, Dennis Shasha, Alex Turchin, Robert A. Greenes, NLM Informatics Training Conference June 27-28, 2006 Vanderbilt University
11. "Better Burst Detection" IEEE International Conference on Data Engineering, April 2006 p. 146ff Xin Zhang and Dennis Shasha
12. "Fast Window Correlations Over Uncooperative Time Series" Richard Cole, Dennis Shasha, and Xiaojian Zhao, ACM Knowledge and Data Discovery 2005, pp. 743-749.
13. "Incremental Methods for Simple Problems in Time Series: Algorithms and Experiments" Xiaojian Zhao, Xin Zhang, Tyler Neylon, Dennis Shasha: International Database Engineering and Applications Symposium 2005: pp. 3-14
14. Dennis Shasha "Computing for Biologists: lessons from some successful case studies" ACM SIGMOD 2005, pp. 968-969.
15. Jinyuan Li, Maxwell Krohn, David Mazieres, and Dennis Shasha "Secure Untrusted Data Repository (SUNDR)" Proceedings of the 6th Symposium On Operating Systems Design and Implementation (OSDI '04) San Francisco, CA. December, 2004.
16. Alberto Lerner, Dennis Shasha, Zhihua Wang, Xiaojian Zhao, Yunyue Zhu "Fast Algorithms for Time Series with Applications to Finance, Physics, Music, Biology and other Suspects" ACM Sigmod 2004, pp. 965-968.
17. D. Shasha, J. T. L. Wang and K. Zhang, "Unordered Tree Mining with Applications to Phylogeny," Proceedings of the 20th International Conference on Data Engineering, Boston, Massachusetts, April 2004, pp. 708-719.
18. "Efficient Elastic Burst Detection in Data Streams" Yunyue Zhu and Dennis Shasha The Ninth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining KDD-2003 24 August 2003 - 27 August 2003
19. "AQuery: Query Language for Ordered Data, Optimization Techniques, and Experiments", Alberto Lerner and Dennis Shasha, VLDB 2003, accepted.

20. "TreeRank: A Similarity Measure for Nearest Neighbor Searching in Phylogenetic Databases" TreeRank: A Similarity Measure for Nearest Neighbor Searching in Phylogenetic Databases" Jason T. L. Wang (NJIT), Huiyuan Shan (NJIT), Dennis Shasha (NYU), William H. Piel (University at Buffalo) "Scientific and Statistical Database Management" (SSDBM2003) July 9-11 2003 Cambridge, MA (USA)
21. Yunyue Zhu, Dennis Shasha "Warping Indexes with Envelope Transforms for Query by Humming" ACM Sigmod, June, 2003.
22. Yunyue Zhu, Dennis Shasha, Xiaojian Zhao "Query by Humming - in Action with its Technology Revealed" ACM Sigmod, June, 2003.
23. Yunyue Zhu, Dennis Shasha "StatStream: Statistical Monitoring of Thousands of Data Streams in Real Time" VLDB, August, 2002. pp. 358-369.
24. R. Giugno, D. Shasha, GraphGrep: A Fast and Universal Method for Querying Graphs. Proceeding of the IEEE International Conference in Pattern recognition (ICPR), Quebec, Canada, August 2002, pp. 112-115.
25. "Building secure file systems out of Byzantine storage", David Mazieres and Dennis Shasha, Principles of Distributed Computing, 2002. pp. 108-117.
26. "A Structure-Based Search Engine for Phylogenetic Databases", Huiyuan Shan, Katherine Herbert, William Piel, Dennis Shasha, Jason T. L. Wang, SSDBM 2002 (Scientific Database Management) pp. 7-10.
27. "ATreeGrep: Approximate Searching in Unordered Trees", Dennis Shasha, Jason T. L. Wang, Huiyuan Shan, Kaizhong Zhang, SSDBM 2002. pp. 89-98.
28. "Database Tuning: principles, experiments, and troubleshooting techniques" Dennis Shasha and Philippe Bonnet VLDB 2002, August 2002.
29. "Database Tuning: principles, experiments, and troubleshooting techniques" Dennis Shasha and Philippe Bonnet Sigmod 2002, May 2002. P. 637.
30. "Algorithmics and Applications of Tree and Graph Searching" Dennis Shasha, Jason Wang, Rosalba Giugno ACM Pods 2002, May 2002. (Invited) pp. 39-52.
31. "What is the Best Way to Find the Binding Site for a Transcription Factor?" Dennis Shasha, Philip Benfey, and Ken Birnbaum, Integrating Genome Sequence, Sequence Variation and Gene Expression 9/28/2001 - 9/30/2001 Cold Spring Harbor, New York.

32. "Declarative Data Cleaning: Language, Model, and Algorithms" Dana Florescu, Helena Galhardas, Cristian Saita, Dennis Shasha, and Eric Simon VLDB, 2001, pp. 371-380
33. "WebFilter: A High-throughput XML-based Publish and Subscribe System" Francoise Fabret, Francois Llirbat, Joao Pereira, Arno Jacobsen and Dennis Shasha VLDB, 2001. pp. 511-520.
34. "Lots o' Ticks: real-time high performance time series queries on billions of trades and quotes" Arthur Whitney and Dennis Shasha Sigmod 2001
35. "Filtering Algorithms and Implementation for Very Fast Publish/Subscribe" Francoise Fabret, Francois Llirbat, Joao Pereira, Ken Ross, Dennis Shasha Sigmod 2001, pp. 115-126.
36. Efficient matching for web-based publish/subscribe systems Francoise Fabret, Francois Llirbat, Joao Pereira, Dennis Shasha Fifth International Conference on Cooperative Information Systems Eilat, Israel 6 -8, September 2000.
37. Publish/Subscribe on the Web at Extreme Speed Francoise Fabret, Francois Llirbat, Joao Pereira, Dennis Shasha VLDB 2000
38. An Approximate Search Engine for Structural Databases Jason Wang, Qicheng Ma, Xiong Wang, Bruce Shapiro, Dennis Shasha, Zasha Weinberger, Kaizhong Zhang Sigmod 2000
39. AJAX: An Extensible Data Cleaning Tool Dana Florescu, Helena Galhardas, Dennis Shasha and Eric Simon Sigmod 2000
40. "Evaluating A Class of Distance-Mapping Algorithms for Data Mining and Clustering," Jason T. L. Wang, Xiong Wang, King-Ip Lin, Dennis Shasha, Bruce A. Shapiro and Kaizhong Zhang, *Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, San Diego, California, August 1999.
41. "An Approximate Oracle for Distance in Metric Spaces" Kaizhong Zhang, Xiong Wang, Jason T. L. Wang, Dennis Shasha Combinatorial Pattern Matching, 1998.
42. "Automated Discovery of Active Motifs in Three Dimensional Molecules," X. Wang, J. T. L. Wang, Dennis Shasha, B. A. Shapiro, S. Dikshitulu, I. Rigoutsos and K. Zhang, *AAAI Proceedings of the 3rd International Conference on Knowledge Discovery and Data Mining*, Newport Beach, California, August 1997, pp. 89-95.

43. "An Approach to Fault-tolerant Parallel Processing on Intermittently Idle, Heterogeneous Workstations" K. Jeong, Dennis Shasha, S. Talla and P. Wyckoff *Fault Tolerant Computer Symposium*, June 1997
44. "The Dangers of Replication and a Solution" Jim Gray, Pat Helland, Patrick O'Neil, and Dennis Shasha *ACM Sigmod 96*, pp. 173-182.
45. "Skip-Over: Algorithms and Complexity for Overloaded Systems that Allow Skips" *IEEE Real-Time Systems Symposium 1995*, December 1995. Gilad Koren and Dennis Shasha.
46. "On the Editing Distance between Undirected Acyclic Graphs and Related Problems" T-L. Wang, K. Zhang, and Dennis Shasha *Sixth ACM Symposium on Combinatorial Pattern Matching, 1995*. (superseded by the journal article of the same title)
47. "Persistent Linda 2: a transaction/checkpointing approach to fault-tolerant Linda" K. Jeong and Dennis Shasha, *Proceedings of the 13th Symposium on Fault-Tolerant Distributed Systems* October 1994
48. "2Q: a low overhead high performance buffer replacement algorithm" T. Johnson and Dennis Shasha, *Very Large Database Systems Conference 1994*, September, 1994.
49. "Combinatorial Pattern Discovery for Scientific Data: Some Preliminary Results" J. T. L. Wang, G-W Chirn, T. G. Marr, B. Shapiro, Dennis Shasha, and K. Zhang *ACM SIGMOD 1994 Conference*, May, 1994.
50. "Competitive On-Line Scheduling for Multiprocessor Real-Time Systems" G. Koren, S-C. Huang, and Dennis Shasha *Proc. of 1993 IEEE Real-Time Systems Symposium, Raleigh-Durham, North Carolina*, December 1993.
51. "D-Over: an optimal on-line scheduling algorithm for overloaded real-time systems" G. Koren and Dennis Shasha *13th IEEE Real-Time Systems Symposium*, December 1992. (superseded by the Siam paper with a similar title)
52. "Simple Rational Guidance for Chopping Up Transactions" Dennis Shasha, E. Simon and P. Valduriez *ACM SIGMOD 1992 Conference*, pp. 298-307 (superseded by the ACM TODS paper with a similar title)
53. "Locking without Blocking: Making Lock-Based Concurrent Data Structure Algorithms Nonblocking" J. Turek and Dennis Shasha *ACM Principles of Database Conference 1992*, pp. 212-222.
54. "Fast Serial and Parallel Algorithms for Approximate Tree Matching with VLDCs" K. Zhang, T-L. Wang, and Dennis Shasha *Combinatorial Pattern Matching conference*, April 1992 (superseded by Journal of Algorithms article with similar title)

55. "A Tool for Tree Pattern Matching" T-L. Wang, K. Zhang, K. Jeong, and Dennis Shasha *Proc. of the 1991 IEEE Int. Conf. on Tools for Artificial Intelligence* San Jose, CA, Nov. 10-13, 1991, pp. 436-444.
56. "On-line Scheduling in the Presence of Overload" S. Baruah, G. Koren, B. Mishra, A. Raghunathan, L. Rosier, and Dennis Shasha *IEEE Foundations of Computer Science Conference*, October, 1991, pp. 101-110. (superseded by the Real Time Systems Journal article of June 1992)
57. "A Framework for Automating Physical Database Design" S. Rozen and Dennis Shasha *17th Very Large Data Bases*, September 1991, pp. 401-412, Barcelona, Catalonia,
58. "Persistent Linda: Linda + Transactions + Query Processing" Brian Anderson and Dennis Shasha Workshop on *Research Directions in High-Level Parallel Programming Languages*, Mont Saint-Michel, France June 1991. Published as Springer-Verlag Lecture Notes in Computer Science 574.
59. "Object Versioning in Ode" Rakesh Agrawal, Steve Buroff, Narain Gehani, and Dennis Shasha *International Conference on Data Engineering* 1991.
60. "Query Processing for Distance Metrics" Dennis Shasha and Tsong-Li Wang *International Conference on Very Large Databases*, pp. 602-613, 1990. (superseded by April 1990 article in *ACM Transactions on Office Information Systems*)
61. "A Framework for the Performance Analysis of Concurrent B-Tree Algorithms" Ted Johnson and Dennis Shasha *9th ACM SIGACT-SIGMOD Conference on Principles of Database Systems*, pp. 273-287, April, 1990. (superseded by journal article in *ACM Transactions on Database Systems*).
62. "New Algorithms for the Editing Distance between Trees" K. Zhang and Dennis Shasha, *1989 ACM Symposium on Parallel Algorithms and Architectures* pp. 117-126, June, 1989. (superseded by journal publication in *Journal of Algorithms*).
63. "Utilization of B-trees with Inserts, Deletes, and Modifies" Ted Johnson and Dennis Shasha *8th ACM SIGACT-SIGMOD Conference on Principles of Database Systems*, pp. 235-246, March, 1989. (superseded by journal publication in the *Journal of Computer Sciences and Systems*).
64. "Concurrent Set Manipulation without Locking" Vladimir Lanin and Dennis Shasha *7th ACM SIGACT-SIGMOD Conference on Principles of Database Systems*, pp. 211-220, March 1988.
65. "A Symmetric Concurrent B-tree algorithm" Vladimir Lanin and Dennis Shasha *Fall Joint Computer Conference*, pp. 380-389, November, 1986.

66. "When Does Non-linear Text Help?" Dennis Shasha *First Expert Database Systems Conference*, pp. 109-115, April, 1986.
67. "Netbook — a data model to support knowledge exploration," Dennis Shasha *Proc. of the 11th International Conference on Very Large Databases*, pp. 418-425, August 1985.
68. "Semantically-based Concurrency Control for Search Structures" N. Goodman and Dennis Shasha, *4th ACM SIGACT-SIGMOD Conference on Principles of Database Systems*, pp. 8-20, March 1985. (superseded by journal publication in *ACM Transactions on Database Systems* 1988).
69. "Temporal Verification of Carrier-Sense Local Area Network Protocols" Dennis Shasha, A. Pnueli and W. Ewald, *11th Annual ACM SIGACT/SIGPLAN Symposium on Principles of Programming Languages*, pp. 54-65, January 1984.
70. "A Concurrency Control Theory for Nested Transactions" C. Beeri, P. Bernstein, N. Goodman, M. Y. Lai, and Dennis Shasha, *2nd Annual ACM Symposium on Principles of Distributed Computing*, pp. 45-62, August 1983.

#### Invited Papers

1. "Incremental Methods for Simple Problems in Time Series: algorithms and experiments" Xiaojian Zhao, Xin Zhang, Tyler Neylon, Dennis Shasha *International Database Engineering and Applications Symposium*, July 2005, pp. 3-16 (invited, keynote).
2. "Activist Data Mining for Computational Science: Tools and Applications" Dennis Shasha, pp. 6-10 *Database Tuning: Principles, Experiments, and Guidance* p. 1 *18th Brazilian Symposium on Databases* October 2003
3. "High Volume Transaction Processing Without Concurrency Control, Two Phase Commit, SQL or C++", Arthur Whitney, Dennis Shasha, Steve Apter. pp. 211-217 *Seventh International Workshop on High Performance Transaction Systems*, September, 1997, Asimolar, California.
4. "Some Approaches to Index Design for Cube Forests" Theodore Johnson and Dennis Shasha *Issue: Supporting On-line Analytical Processing* (editor: Daniel Barbara) March 1997 issue of the *IEEE Data Engineering Bulletin* <http://www.research.microsoft.com/research/db/debull/>

## Web Sites

- Web sites:  
<http://cs.nyu.edu/cs/faculty/shasha/papers/tree.html> [ordered tree matching]  
<http://cs.nyu.edu/cs/faculty/shasha/papers/treearch.html> [unordered tree matching]  
<http://cs.nyu.edu/cs/faculty/shasha/papers/graphgrep/index.html> [graph matching]  
<http://cs.nyu.edu/cs/faculty/shasha/papers/statstream.html> [time series matching]  
<http://cs.nyu.edu/cs/faculty/shasha/fintime.html> [benchmark for financial databases]  
<http://cs.nyu.edu/cs/faculty/shasha/spytime/spytime.html> [benchmark for bitemporal databases]

## Technical Reports or Unrefereed Conference Papers (otherwise unpublished)

1. “Repeatability & Workability Evaluation of SIGMOD 2009” S. Manegold, I. Manolescu, L. Afanasiev, J. Feng, G. Gou, M. Hadjieleftheriou, S. Harizopoulos, P. Kalnis, K. Karanasos, D. Laurent, M. Lupu, N. Onose, C. Re, V. Sans, P. Senellart, T. Wu, and D. Shasha Sigmod Record, September 2009 <http://www.sigmod.org/publications/sigmod-record/0909/index.html>
2. “The repeatability experiment of SIGMOD 2008” Ioana Manolescu, Loredana Afanasiev, Andrei Arion, Jens Dittrich, Stefan Manegold, Neoklis Polyzotis, Karl Schnaitter, Pierre Senellart, Spyros Zoupanos, Dennis Shasha: SIGMOD Record 37(1): 39-45 (2008)
3. “Verifying a Design Pattern for the Fault-Tolerant Execution of Parallel Programs” Ekkart Kindler and Dennis Shasha NYU TR TR2000-803
4. “An Extensible Framework for Data Cleaning” Helena Galhardas, Daniela Florescu, Dennis Shasha and Eric Simon, INRIA, July, 1999
5. “Hierarchically Split Cube Forests for Decision Support: description and tuned design” Ted Johnson and Dennis Shasha NYU Computer Science Technical Report 727, November, 1996.
6. “Reference Manual for ATBE — a tool for approximate tree pattern matching” T-L. Wang, K. Jeong, K. Zhang, and Dennis Shasha NYU Computer Science Technical Report 551, March, 1991.

7. “Beyond Fail-Stop: Wait-Free Serializability and Resiliency in the Presence of Slow-Down Failures” J. Turek and Dennis Shasha, NYU Computer Science Technical Report 514, September, 1990.
8. “An Analytical Model for the Performance of Concurrent B Tree Algorithms” V. Lanin, J. Schmidt and Dennis Shasha, Ultracomputer Note 124, Computer Science Technical Report 311, 1987.

### Authored Books

- *Network Inference in Molecular Biology – a hand-on framework* Jesse Lingeman and Dennis Shasha, Springer Verlag, to appear.
- *Stored Clocked Programs Inside DNA: a simplifying framework for Nanocomputing* Jessie Chang and Dennis Shasha Morgan and Claypool, 2011, 66 pages  
ISBN: 9781608456956 paperback  
ISBN: 9781608456963 ebook
- *Natural Computing: DNA, Quantum Bits, and the Future of Smart Machines* Dennis Shasha and Cathy Lazere, W. W. Norton, 2010, 288 pages  
ISBN-10: 0393336832  
ISBN-13: 978-0393336832  
Translated to French (Dunod) and Italian (Santachiara) complete and translation in progress to Japanese (Uni Agency).
- *Statistics is Easy!* Dennis Shasha and Manda Wilson, Morgan Claypool publishing 2008, 74 pages, (doi:10.2200/S00142ED1V01Y200807MAS001) <http://www.morganclaypool.com/doi/abs/10.2200/S00142ED1V01Y200807MAS001>  
A resampling (distribution-free) approach to statistics written for computer scientists, engineers, and natural scientists.
- *Iraq’s Last Jews: Stories of Daily Life, Upheaval, and Escape from Modern Babylon* Tamar Morad, Dennis Shasha, and Robert Shasha 2008, 256 pages, Palgrave Macmillan. ISBN: 978-0230608108 A book of oral histories.
- *Puzzles for Programmers and Pros* John Wiley/Wrox, May 2007. Puzzles and methods to solve puzzles. Translations to Korean and Japanese (Ohmsha). Reprinted in India (JWS-India).
- *The Puzzler’s Elusion: A Tale of Fraud, Pursuit, and the Art of Logic* Thunder’s Mouth Press, March 2006. A further collection of puzzles from Scientific American and Dr. Dobb’s Journal. Translation to traditional Chinese 2007.

- *Puzzling Adventures* W. W. Norton, January 2005. A collection of puzzles from Scientific American and Dr. Dobb's Journal. Puzzle contest was won by Jeremiah Farrell and written about on May 19, 2006 in the NY Sun under the title "A Washington Square Park Puzzle is Solved" by Gary Shapiro in the Arts and Letters section.) Translation to Portugese in progress.
- *High Performance Discovery in Time Series: techniques and case studies* Dennis Shasha and Yunyue Zhu, Springer Verlag Publishers, Monographs in Computer Science, June 2004, ISBN 0387008578, 270 Pages.
- *Database Tuning : Principles Experiments and Troubleshooting Techniques* Dennis Shasha and Philippe Bonnet, Morgan Kaufmann Publishers, June 2002, ISBN 1-55860-753-6, Paper, 464 Pages. (Translations to Russian (Kudits obraz), simplified Chinese (Publishing House of Electronics Industry, phei), and Korean (Brain Korea) are complete.)
- *Dr. Ecco's Cyberpuzzles : 36 Puzzles for Hackers and Other Mathematical Detectives* Dennis E. Shasha W. W. Norton, 2002. ISBN 0-393-05120-X, 231 pages. (Translations to Korean, Simplified Chinese, Korean, Polish, and Turkish currently in progress. Translation to Czech, Hungarian, French, German, Portugese, and traditional Chinese complete.)
- *Red Blues : Voices from the Last Wave of Russian Immigrants* by Dennis Shasha, Marina Shron Holmes and Meier, 2002. Among the reviews: <http://www.qualitative-research.net/fqs-texte/1-07/07-1-19-e.htm>
- *Out of Their Minds: the lives and discoveries of 15 great computer scientists* by Dennis Shasha and Cathy Lazere, Springer-Verlag, New York, August, 1995.  
(Book of short biographies and research philosophies. Translated to Japanese, Korean, traditional Chinese (Taiwan), and simplified Chinese (China).)
- *Database Tuning — a principled approach*, by Dennis Shasha, Prentice-Hall, Englewood Cliffs, NJ, 1992.  
(Book to help practitioners improve the performance of database applications that are built on top of commercial database management systems.)
- *Codes, Puzzles, and Conspiracy* by Dennis Shasha, W. H. Freeman, New York 1992. Republished by Dover in 2004.  
(Adventures of a mathematical detective whose problems are often algorithmic or combinatoric in nature. Second in series. Translated to French, Portuguese, Slovenian, and Turkish. Also translated to Spanish in two separate editions.)
- *The Puzzling Adventures of Dr. Ecco* by Dennis Shasha, W. H. Freeman, New York 1988. Dover, 1997.

(Adventures of a mathematical detective whose problems are often algorithmic or combinatoric in nature. First in series. Translated to Chinese, French, German, Italian, Spanish, Japanese, Portuguese, Turkish, Slovenian, and Hungarian. Cited by Professor Andy Liu, selected the Canadian Professor of the Year in 1999, as his favorite book for teaching mathematics at the University of Alberta. The book is also used at Grant MacEwan College.)

### Co-Edited Books

- *Data Mining in Bioinformatics* J. T. L. Wang, M. J. Zaki, H. T. T. Toivonen and D. Shasha (eds.), 350 pages, Springer-Verlag, ISBN: 1-85233-671-4, August 2005.
- *Pattern Discovery in Biomolecular Data: Tools, Techniques, and Applications* Jason Wang, Bruce Shapiro, and Dennis Shasha (Eds.) Oxford University Press, November, 1999.

### Patents

- “Conditional Transition Networks and Computational Processes for Use in Interactive Computer-based Systems” Dennis Shasha, March 2, 1998 US 5,809,212.
- “Method and apparatus for optimizing and structuring data by designing a cube forest data structure for hierarchically split cube forest template” Theodore Johnson and Dennis Shasha, October 31, 2000, US 6,141,655.
- “Concurrent Reconciliation of an Update Stream with Database Reassignment of Scheduling Databases” Peter Koppstein, Benjamin Park and Dennis Shasha, November, 2000, US 6,138,118.
- ”Fault Tolerant Storage System” Ted Johnson and Dennis Shasha April, 2001, US 6,219,800.
- ”Method and Apparatus for loading Data into a Cube Forest Data Structure” Ted Johnson and Dennis Shasha U.S. Patent 6,334,125 December 25, 2001
- ”Method and Apparatus for Querying a Cube Forest Data Structure” Ted Johnson and Dennis Shasha U.S. Patent 6,424,967 July 23, 2002
- ”Methods and Apparatus for Protecting Information” Michael Rabin and Dennis Shasha U.S. Patent 6,697,948 February 24, 2004 (29 references)
- ”Methods And Apparatus For Protecting Information” Michael O. Rabin, Dennis E. Shasha Australia, Patent 767286 19 February 2004

- "Methods And Apparatus For Protecting Information" Michael O. Rabin, Dennis E. Shasha New Zealand Patent 515938 November 11, 2004
- "Methods And Apparatus For Protecting Information" Michael O. Rabin, Dennis E. Shasha Mexico Patent 224912 December 13, 2004
- "Method and Apparatus for Protecting Information and Privacy" Michael Rabin and Dennis Shasha U.S. Patent 6,889,209 May 3, 2005. (7 references)
- "Method and Apparatus for Protecting Information" Michael Rabin and Dennis Shasha U.S. Patent 7,073,197 July 4, 2006.
- "Method and Apparatus for Protecting Information" Michael Rabin and Dennis Shasha U.S. Patent 7,131,144 October 31, 2006.
- "Detection and Identification Methods for Software" Michael O. Rabin, Dennis E. Shasha, Carleton J. Bosley, Ramon Caceres, Aaron Ingram, Timir Karia, David Molnar and Yossi Beinart U.S. Patent 7,287,159 October 23, 2007.
- "Method and apparatus for protecting information and privacy" Michael Rabin and Dennis Shasha U.S. Patent 7,406,593 July 29, 2008
- "System and process of determining a biological pathway based on a treatment of a biological specimen" Peter Palenchar, Dennis Shasha, Michael Chou, Marc Rejali, Yair Dorsett, Andrei Kouranov, Gloria Coruzzi U.S. Patent 7,739,053 June 15, 2010
- "Method and Apparatus for Protecting Information and Privacy" Michael Rabin and Dennis Shasha U.S. Patent 7,747,873 June 29, 2010
- "System and Method for Representing the Interactions between Multiple Inputs and At Least One Output" Dennis Shasha, Rodrigo Gutierrez, W. Bradford Paley, Christopher Poultney, and Gloria Coruzzi U.S. Patent 7,805,703 September 28, 2010
- "Method and Apparatus for Protecting Information and Privacy" Michael Rabin and Dennis Shasha U.S. Patent 7,991,995 August 2, 2011.

#### **Co-Edited Conference Proceeding**

- Catriel Beeri, Atsushi Ohori and Dennis E. Shasha (Eds.) *Database Programming Languages (DBPL-4) Proceedings of the Fourth International Workshop on Database Programming Languages - Object Models and Languages*, Manhattan, New York City, USA, 30 August - 1 September 1993 ISBN: 3-540-19853-9 / Springer-Verlag Workshops in Computing Series Feb. 94.

### Invited Book Chapters

- in *Graph Data Management: Techniques and Applications* Sherif Sakr and Eric Pardede (eds) DOI: 10.4018/978-1-61350-053-8 ISBN13: 9781613500538 ISBN10: 161350053X EISBN13: 9781613500545
- “Visualizing the Outcomes of N Experiments on M Entities: an aid to insight” Chris Poultney and Dennis Shasha in *Plant Systems Biology* Gloria Coruzzi and Rodrigo Gutierrez (eds) Blackwell Publishing Ltd 12 pages.
- Cinzia Di Pietro, Alfredo Ferro, Giuseppe Pigola, Alfredo Pulvirenti, Michele Purrello, Marco Ragusa, Dennis Shasha AntiClustAl: Multiple sequence alignment by antipole clustering *Data Mining in Bioinformatics 2005*: pp. 43-57.
- “Tuning Database Design for High Performance” Dennis Shasha and Philippe Bonnet, in *CRC Handbook of Computer Science and Engineering 2004* Allen Tucker (ed.) in press
- “Scheduling Overloaded Real-Time Systems with Competitive/Worst Case Guarantees” Gilad Koren and Dennis Shasha in *Handbook of Scheduling: Algorithms, Models, and Performance Analysis* Joseph Y-T Leung, Chapman Hall/CRC, publishers.
- “Approximate Tree Pattern Matching” Dennis Shasha and Kaizhong Zhang, in *Pattern Matching in Strings, Trees, and Arrays* A. Apostolico and Z. Galil (eds.) pp. 341-371. Oxford University Press, 1997. ISBN 0-19-511367-5
- “Tuning Database Design for High Performance” Dennis Shasha, in *CRC Handbook of Computer Science and Engineering 1997*, ISBN 0-8493-2909-4 Allen Tucker (ed.) pp 995 - 1011

### Web Publications

- “FinTime, a financial time series benchmark,” <http://cs.nyu.edu/cs/faculty/shasha/fintime.html> Kaiippallimalil J. Jacob and Dennis Shasha April, 1999.

### Invited Talks

1. ”Changing Nature of Invention in Computer Science” UC Santa Barbara April 9, 2012
2. ”Stored Clocked DNA Computing” IBM Research September 28, 2011
3. ”Stored Clocked DNA Computing” Carnegie Mellon University September 16, 2011

4. "Natural Computing" ATT Tech Talk, April 2011 <http://techchannel.att.com/>
5. "Digital Rights Management" ATT Tech Talk, April 2011 <http://techchannel.att.com/>
6. "Data Quality is Bad? Deal With It" DIMACS/CCICADA Workshop on Data Quality Metrics February 4, 2011.
7. "Linguistic Explorer: a tool for cross-linguistic research" Middlebury College, October 22, 2010
8. "Secure Data Outsourcing" BBI Colloquium in Berlin, Technische Universitat, May 29, 2009.
9. "Secure Data Outsourcing" Telcordia, January 29, 2009.
10. "DNA Hash Pooling and its Applications" Program in Integrative Information, Computer and Application Sciences. Princeton University. April 14, 2008.
11. "Dealing with Scale in Visualization and Machine Learning" Bringing Plant and Computing Scientists Together to Solve Plant Biology's Grand Challenges 2008. Cold Spring Harbor Lab. April 7, 2008.
12. "Biocomputational Puzzles: data, algorithms, and visualizations" Extending Database Technology, 2008, p. 2. Nantes, France. March 27, 2008.
13. "StrangerDB: database management with an untrusted server" Universite Pierre et Marie Curie, Paris. May 23, 2007.
14. "The Nature of Invention in Computer Science: a collaborative reflection based on the book *Out of their Minds*" Humboldt University, Berlin. May 7, 2007.
15. "Upstart Puzzles" Distinguished lecture series. Max Planck Institut fuer Informatik, Saarbruecken, Germany April 25, 2007.
16. "The Nature of Invention in Computer Science: a collaborative reflection based on the book *Out of their Minds*" American University of Paris, France, April 23, 2007.
17. "Biocomputational Puzzles" University of Montpellier, France February 1, 2007.
18. "StrangerDB: database management with an untrusted server" Conference on Management of Data (COMAD) keynote, Delhi, India, December 15, 2006
19. "The Nature of Invention in Computer Science: a collaborative reflection based on the book *Out of their Minds*" French Ministry of Research, Paris, France, November 29, 2006.

20. “Biocomputational Puzzles” Ecole Polytechnique de Lausanne, Switzerland, November 11, 2006.
21. “Fast Calculations of Simple Primitives in Time Series” Universite Marne la Vallee, France, November 7, 2006.
22. “Upstart Puzzles” American University of Paris, France, November 7, 2006.
23. “StrangerDB: database management with an untrusted server” Utrecht, the Netherlands. September 18, 2006
24. “The Nature of Invention in Computer Science: a collaborative reflection based on the book *Out of their Minds*” Utrecht, the Netherlands. September 18, 2006
25. “StrangerDB: database management with an untrusted server” DB/IR conference. Rutgers New Jersey, April 29 2006
26. “Biocomputational Puzzles” IBM corporation, September 30, 2005.
27. “Biocomputational Puzzles” Xerox corporation, July 28, 2005, distinguished lecture series.
28. “Incremental Methods for Simple Problems in Time Series: algorithms and experiments” Xiaojian Zhao, Xin Zhang, Tyler Neylon, and Dennis Shasha International Database Engineering and Applications Symposium, July 2005, Montreal Canada July 25, 2005.
29. “Privacy-preserving Piracy Prevention”, Fifth Haifa Workshop on Interdisciplinary Applications of Graph Theory, Combinatorics and Algorithms, May 16, 2005
30. “Biocomputational Puzzles” Sloan Kettering (Chris Sander group) May 12, 2005
31. “Privacy-preserving Piracy prevention” Massachusetts Institute of Technology March 14, 2005
32. “Upstart Puzzles” University of Waterloo, Canada. January 18, 2005
33. “Privacy-preserving Piracy prevention” University of Waterloo, Canada. January 17, 2005
34. “The Graph of Life” American Museum of Natural History, New York, USA January 14, 2005
35. “Upstart Puzzles” City University of New York May 13, 2004.

36. "Upstart Puzzles" Distinguished Speaker Seminar Series - Dennis Shasha  
New Jersey Institute of Technology. February 25, 2004.
37. "Upstart Puzzles" Canadian Mathematical Society, June 15, 2003. Plenary speaker.
38. "Tools for Time Course Data", New York Academy of Sciences, May 21, 2003
39. "Aquery: a database system for order" Stanford University, January 10, 2003
40. "Building a Database for Order" New England Database Symposium, Brandeis, April 12, 2002.
41. "Mathematical Insight, Science, and Finance" Penn State, February 28, 2002
42. "Graphs, Puzzles, and Graph Generators" DIMACS, November 16, 2001.
43. "Activist Data Mining (as applied to Carbon:Nitrogen sensing in plants)" DIMACS Summer School on New Frontiers in Data Mining August 17, 2001. Rutgers New Jersey.
44. "Figuring Out Transcription Factor Networks" IBM Yorktown Research, April 26, 2000. Laxmi Parida, host.
45. "Approximate Graph Matching: approaches and a tool" University of Pennsylvania. April 13, 2000. Peter Buneman, host.
46. "Figuring Out Transcription Factor Networks" Rockefeller University, April 4, 2000. Eric Siggia, host.
47. 5 talks at the University of Catania June 17 and 18, 1999:
  - i) Data Mining and Tree Matching
  - ii) An attribute management system
  - iii) Time Series in Finance.
  - iv) Advanced Database Tuning and Configuration
  - v) Upstart Puzzles
48. Time Series in Finance  
Dennis Shasha  
ENST Bretagne, France  
invited by: Philippe Picouet
49. Time Series in Finance  
Dennis Shasha Summer School in Extending Database Technology, May 20, 1999, La Baule, France.

50. An Attribute Management System  
Dennis Shasha Humboldt University, Berlin, Germany April 30, 1999.  
(invited by Professor Oliver Guenther)
51. A System for Exploration Management  
Dennis Shasha University of Aachen, April 8, 1999. (invited by Professor  
Matthias Jarke)
52. A System for Exploration Management  
Dennis Shasha University of Rome, La Sapienza March 4, 1999. (invited  
by Professor Maurizio Lenzerini)
53. A System for Exploration Management  
Dennis Shasha ETH, Zurich Switzerland February 22, 1999. (invited by  
Professor Hans-Joerg Schek)
54. A System for Exploration Management  
Dennis Shasha University of Saarbruecken, Germany February 19, 1999.  
(invited by Professor Gerhard Weikum)
55. A System for Exploration Management  
Dennis Shasha University of Muenster, Germany December 9, 1998. (in-  
vited by Professor Gottfried Vossen)
56. "Time Series in Finance: the array database approach" Dennis Shasha  
VLDB Conference, August, 1998.
57. New York's Top Software Researchers  
Top Researchers from NYU  
Wednesday, March 11, 1998  
153 E. 53rd St., NY, NY "Thinksheet: a Spreadsheet for Complex Think-  
ing" Dennis Shasha sponsored by the New York Software Industry Asso-  
ciation.
58. "Free Parallel Data Mining" ACM Sigmod 1998, Bin Li and Dennis Shasha.
59. "Lessons from Wall Street: case studies in database tuning, configuration,  
and replication" Dennis Shasha ACM Sigmod 1997, pp. 498-501.
60. "Structural Matching and Discovery in Document Databases" ACM SIG-  
MOD 1997, demonstration. J. T. L. Wang, Dennis Shasha, G. J. S. Chang,  
L. Relihan and K. Zhang, *Proceedings of the ACM SIGMOD International  
Conference on Management of Data*, Tucson, Arizona, May 1997, pp. 560-  
563.
61. "Finding Patterns in Scientific Databases" Dennis Shasha National Sci-  
ence Foundation, Arlington, Virginia. April, 1997.

62. "High Volume Transaction Processing Without Concurrency Control, Two Phase Commit, SQL or C++" Dennis Shasha University of Texas at Austin, February 1997.
63. "High Volume Transaction Processing Without Concurrency Control, Two Phase Commit, SQL or C++" Dennis Shasha Bell Communications Research September 19, 1996
64. "Thinksheet: a tool for tailoring complex documents" ACM SIGMOD 1996, June, 1996, demonstration (Peter Piatko, Roman Yangarber, Daoi Lin, Dennis Shasha)
65. "Hierarchically Split Cube Forests for Decision Support: Description and Tuned Design" Dennis Shasha February 21, 1996, Northeastern University
66. "Thinksheet: a system to help readers and writers of complex documents" Dennis Shasha Bell Communications Research, Morristown New Jersey, October 19, 1995.
67. "Thinksheet: a system to help readers and writers of complex documents" Dennis Shasha Inria, Rocquencourt, France. July 15, 1995.
68. "Pattern Matching and Pattern Discovery in Scientific, Program, and Document Databases" T-L. Wang, K. Zhang and Dennis Shasha at ACM Sigmod 95.
69. "Database Tuning: principles and surprises" Dennis Shasha New York Academy of Sciences (Computer Science section), October, 1994.
70. "Upstart Puzzles" Dennis Shasha New York Academy of Sciences (math section), March, 1993.
71. "Database Tuning: a principled approach" Dennis Shasha ACM SIGMOD conference, June, 1992.
72. "Database Tuning: a principled approach" Dennis Shasha Very Large Database Systems Conference, June, 1992.
73. "D-Over: an optimal algorithm for overloaded real-time systems" Dennis Shasha Institut Nationale de Recherche en Informatique et en Automatique, France, January, 1992.
74. "D-Over: an optimal algorithm for overloaded real-time systems" Dennis Shasha University of Paris, 6, April, 1992.
75. "Promises Versus Assumptions in Database Fault Tolerance," Dennis Shasha and J. Turek *VIIemes Journees Bases de Donnees Avancees* 25-27 Septembre 1991, pp. 349-366.

76. “PLinda: Linda + Transactions + Query Processing + Fault Tolerance” Dennis Shasha ETH, Zurich (December 3, 1991) and Aachen, West Germany (October 7, 1991)
77. “Wait-Free Serializability and Recoverability” Dennis Shasha IBM T. J. Watson Research Laboratories December 19, 1990
78. “Towards a Theory of Hypermedia” Dennis Shasha IBM T. J. Watson Research Laboratories February 16, 1990
79. “A Toolkit for Finding the Editing Distance between Trees” Dennis Shasha IBM T. J. Watson Research Laboratories February 16, 1990

## Service

### Administrative Positions Within NYU

Director of Graduate Studies in Computer Science, 1999-2005  
 Director of the Masters in Information Systems, 1997-1998  
 Fellowship Committee, 1986 – 1991.  
 Undergraduate Curriculum Committee, 1986 – 1991.  
 Policy and Planning Committee, fall, 1988.  
 Director of Undergraduate Studies, fall, 1992 – 1995..

### Courses Developed

Computers in Principle and Practice, first taught in fall 1989  
 Distributed Computing, first taught in fall 1989  
 Evolution of Computational Thought, first taught in fall 1993 (in the Department of Liberal Studies)

### Editorship

1. Co-editor-in-chief of *Information Systems*, a journal published by Elsevier North-Holland. (with Prof. Gottfried Vossen of the University of Muenster).
2. Series editor *Systems Biology* for Oxford University Press.

### Reviewing Service

1. NSF Large Project Proposals, panel 2012
2. KDD 2011 (Knowledge and Data Discovery), program committee
3. Transactions on Knowledge Discovery in Data, 2010
4. VLDB program committee, 2010

5. NSF Large Project Proposals, panel 2010
6. Combinatorial Pattern Recognition, 2010, program committee
7. NSF reviewer, 2009
8. ACM SIGMOD 2008, program chair
9. Genome Research, reviewer
10. VLDB 2007, tutorial co-chair
11. ACM SIGMOD 2007, program committee.
12. Second International Workshop on Self-Managing Database Systems (2007), program committee.
13. ICDE 2007 (23rd International Conference on Data Engineering), program committee.
14. NSF Panel May 10-12 2006 for Arabidopsis 2010 grants (plant biology).
15. KDD 2006 (Knowledge and Data Discovery), program committee
16. ICDM 2005 (International Conference on Data Mining), program committee member
17. VLDB 2005 program committee.
18. VLDB 2004 (Very Large Databases), program committee member.
19. NASA Intelligent Systems reviewer, May 2004.
20. National Science Foundation panel, medium ITR grants. May 19,20 2003.
21. Workshop on Bioinformatics 2003, program committee member.
22. Best paper award committee, 2002 ACM SIGKDD 2002 (Knowledge Discovery and Data Mining)
23. member of program committee, Extending Database Technology, 2002.
24. member of program committee, Scientific Data Management, 2002.
25. member of program committee, KDD 2001, (Knowledge and Data Discovery)
26. member of program committee, COMAD 2000
27. member of program committee, SSDBM2000 (Scientific and Statistical Database Management)

28. member of program committee, VLDB 2000 (Very Large Database Conference)
29. tutorial chair, ACM SIGMOD 99.
30. member of program committee, BDA'98 (French Database Conference).
31. member of program committee, 10th Conference on Scientific and Statistical databases, 1998
32. co-chair of the industrial committee, Very Large Data Base Conference, 1998.
33. member of program committee, Combinatorial Pattern Recognition, 1996.
34. member of program committee, ACM Sigmod 1996.
35. member of program committee, Very Large Data Base Conference 1995.
36. member of program committee, IEEE Real-time Systems Symposium, 1995
37. panel chair, ACM SIGMOD 1995.
38. member of program committee, ACM Principles of Database Systems, 1994.
39. member of program committee, EDBT (extending database technology conference) 1994.
40. Co-chair of program committee, Database Programming Language Workshop, August, 1993.
41. Member of program committee, ACM Sigmod Conference program committee, May, 1993.
42. Member of program committee, 2nd International Symposium on Databases in Parallel and Distributed Systems 1990
43. Member of program committee, Very Large Data Base Conference 1991.

**Journal Reviews:**

1. IEEE Computational Biology and Bioinformatics 2008.
2. Genome Research, 2003
3. Plant Cell 2003.
4. ACM Trans on Computer Systems, 2003.

5. ACM Crossroads, 2002, in interdisciplinary computer science.
6. National Science Foundation Panel: 1993.
7. National Science Foundation Panel: 1995.
8. Europhysics Letters
9. Articles reviewed for Journal of the ACM,  
ACM Transactions on Database Systems,  
ACM Transactions on Office Information Systems,  
IEEE Journal on Selected Areas in Communications,  
Real Time Systems Journal,  
IEEE Computer,  
IEEE Transactions on Software Engineering,  
IEEE Transactions on Computer,  
IEEE Transactions on Knowledge and Data Engineering (most recent  
2009)  
ACM Computing Surveys  
Siam Journal on Computing  
Acta Informatica,  
Journal of Parallel and Distributed Computing,  
Journal of Man-Machine Studies,  
Letters on Programming Languages and Systems,  
Journal of Algorithms,  
VLDB Journal,  
Algorithmica.
10. Proposals reviewed for National Science Foundation.
11. Proposal reviewed for the French minister of research (1992) and Centre  
National de Recherche Scientifique (1993).
12. Proposal reviewed for Australian Research Council. (1994).
13. Proposals reviewed for the Israel Science Foundation (1998).
14. Books reviewed for Academic Press, Addison Wesley, Prentice Hall, Mor-  
gan Kaufmann, Birkhauser.
15. External appraiser for Univ. of Toronto and Rutgers.

### **Research Funding**

1. Conceptual Data Integration for the Virtual Plant PI: Gloria Coruzzi  
(FAS-Bio)/Dennis Shasha 6/1/2005 - 5/31/2008 Award number DBI-  
0445666

2. Genomics of Comparative Seed Evolution Gloria Coruzzi/Dennis Shasha 10/1/2004 - 9/30/2009 Award Number: DBI-0421604
3. High-throughput functional analysis of differentiation network genes Kenneth Birnbaum (FAS-Bio)/Dennis Shasha 9/1/05 - 8/31/09 Award Number: DBI-0519984
4. Primitives for Online Time Series Analysis Dennis Shasha, PI IIS-0414763
5. Arabidopsis 2010: Genomics Approaches to Finding Transcriptional Networks Philip Benfey, PI MCB-0209754
6. Cold Spring Harbor/NYU/NYBG Genomics Consortium 2001-2004. Support for one graduate student.
7. N2010: Nitrogen Networks in Plants National Science Foundation : 2001-2005. Collaborators: Dan Bush, Nigel Crawford and Gloria Coruzzi, UIUC, UCSD and NYU. NSF Award Number: 0115586
8. *ASES: an approximate search engine for structure* 2000-2003. National Science Foundation. Award number: 9988345. Approximately, \$282,440 over three years.
9. Grant: 1F32 GM20716-01 *Research Fellowship Award, Department of Health and Human Services, National Institutes of Health. For project entitled: "Using Computers to Analyze Transcription Factor Networks"* Duration: 3 years Activation date: July 1, 2000. Support for Dr. Ken Birnbaum in our joint project. (\$100,848 over three years)
10. IRI 97-11374, Isolation Testing, 3-yr grant from 9/1/97 to 8/31/00. (www.cs.umb.edu/isotest) PI: Pat and Betty O'Neil 1/2 month per year consultant.
11. *"Pattern Discovery in Combinatorial Databases: Algorithms, Applications, and Software for the Scientific Community.*, 1996-1999. IRI-9531554, approximately \$135,000 per year.
12. *Discovering Motifs in Scientific Databases*, principal investigator, 1993-1995, National Science Foundation IRI-9224601.
13. *The Design and Implementation of Griffin*, Co-principal investigator (with R. Dewar, B. Goldberg, M. Harrison, and E. Schonberg), 1989–1993, Office of Naval Research.
14. *Robust Parallel Computation*, Co-principal investigator (with Z. Kedem), 1991-1992, National Science Foundation.
15. *Performance of Concurrent Data Structure Algorithms*, Principal Investigator, 1989-1991, National Science Foundation.

16. *Research on Semantically-based Concurrency Control for Data Structures*, Principal Investigator, 1985-1988, National Science Foundation.

**Who's Who Entries**

1. International Authors and Writers Who's Who, fifteenth edition.