

Rahul Shah

Roy Paul Daniels Distinguished (Associate) Professor
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RESEARCH INTERESTS

Theory: Algorithms and Data Structures. Indexing Structures for Compressed Text Data, Uncertain Data, Disk-Based Massive Data.

Applications: Database Systems, Information Retrieval, Data Compression, Bioinformatics.

Specific Research Areas: Uncertain and Ranked Databases, Compressed and Succinct Data Structures, Pattern Matching and String Retrieval, External Memory and Parallel Disk Algorithms.

EDUCATION

Doctor of Philosophy (Computer Science) May 2002
Rutgers University, New Brunswick, NJ

Master of Science (Computer Science) January 1999
Rutgers University, New Brunswick, NJ

Bachelor of Technology (Comp. Sci. & Engg.) May 1997
Indian Institute of Technology, Bombay, India

WORK EXPERIENCE

Position	University/Company	Start Date	End Date
Program Director	National Science Foundation	July 2015	-
Associate Professor	Louisiana State University	August 2013	-
Assistant Professor	Louisiana State University	August 2007	July 2013
Research Assistant Professor	Purdue University	May 2005	July 2007
Research Staff Member	IBM India Research Lab	August 2004	May 2005
Visiting Assistant Professor	Purdue University	Oct. 2002	July 2004
Graduate Research Assistant	Rutgers University	Sept. 1997	May 2002
Summer Intern	Telcordia Technologies (BellCore)	May 2000	Sept. 2000
Summer Intern	Bell Communications Research (BellCore)	May 1998	August 1998
Instructor/Teaching Assistant	Rutgers University	Fall 1997	Spring 2002

PROFESSIONAL SERVICES

- Senior Member, ACM
- Program Director, Algorithmic Foundations, CCF, CISE
 - a. Responsible for AF Core programs, CAREER, CRII
 - b. Cross-cutting programs like
 1. BIGDATA
 2. Research Experience for Undergraduates (REU) Sites
 3. Smart and Connected Communities (SCC)
 4. Algorithms in the Field (AitF)
- NSF Panelist 2011, 2012, 2013
- Associate Editor, PeerJ Computer Science, Associate Editor (Algorithms Area), 2015 – date

- International Symposium on Algorithms and Computation ISAAC 2015
- String Processing and Information Retrieval SPIRE 2007, 2012, 2013, 2014
- ACM SIGSPATIAL Workshop on Querying Uncertain and Spatio-Temporal Data 2009, 2012
- International Conference on Algorithms and Architectures in Parallel Processing ICA3PP 2010, 2011, 2012, 2013
- Combinatorial Pattern Matching CPM 2010, 2012, 2017
- Data Compression Conference DCC 2016, 2017
- International Conference on Parallel and Distributed Systems ICPADS 2011
- External Reviewer for Conferences: SODA, ESA, ISAAC, LATIN, FSTTCS, WADS, ICDE, SIGMOD, VLDB (over multiple years for many of these conferences)
- External Reviewer for various Journals (including):
Algorithmica, Journal of Discrete Algorithms, Journal of Classification, TPDS, VLDB Journal, TKDE, Information and Computation, ACM Transactions on Algorithms (TALG), IEEE Transactions on Systems, Man and Cybernetics, Theoretical Computer Science, Information Processing Letters, ACM Trans. On Spatial Algorithms and Systems
- Graduate Student Supervision: 2 academic placements + 3 students placed at Facebook/Google
 - Sharma Thankachan (PhD 2013, assistant professor at University of Central Florida)
 - Manish Patil (PhD 2014, research scientist at Facebook)
 - Sudip Biswas (PhD 2015, research scientist at Facebook)
 - Arnab Ganguly (PhD 2017, assistant professor at University of Wisconsin- White Water)
 - Sabrina Chandrasekaran (MS Thesis 2010, Amazon.com)
 - Xuanting Cai (MS Thesis (PhD math), Google, Inc)
 - Emran Chowdhury (MS Thesis, Amazon.com)
 - Phani Siddapareddy (MS Project, 2009)
 - Rasagnya Ryali (MS Project, 2011)

GRANTS

Total Funding: \$2,346,000; PI Share: \$1,345,666; Funded, continuously by NSF programs since 2006

- IPA Award (Non-research grant supporting only 20% research effort)
Funding Agency: National Science Foundation 1547616/1650704/ (3rd yr being negotiated)
Duration: July 2015 – June 2018
Role: PI
Amount: \$578,998 ; PI Shah's budget: \$578,998
- AF: Small: Compact Data Structures for String Matching and Retrieval
Funding Agency: National Science Foundation CCF – 1527435
Duration: June 2015 – May 2018
Role: PI (currently substituted to PI: Sukhamay Kundu)
Amount: \$225,787; PI Shah's budget: \$225,787
- AF: III: Small: Space-Efficient Frameworks for Multi-pattern Matching in Text Streams
Funding Agency: National Science Foundation CCF - 1218904
Duration: October 2012 – September 2016
Role: PI (substituted to PI Sukhamay Kundu for the last year)
Amount: \$184,261; PI Shah's budget: \$184,261
- AF:DC: Collaborative Research: Pattern Matching for Massive Data Sets
Funding Agency: National Science Foundation CCF – 1017623
Duration: August 2010 – July 2013
Role: PI
Rahul Shah (PI), Jeffrey Vitter (SI, subcontract)
Total amount: \$500,000; PI Shah's budget: \$264,227

- Performance Models and Systems Optimization for Disk-Bound Applications
Funding Agency: National Science Foundation CCF – 0621457
Duration: October 2006 – September 2010
Role: co-PI
Mithuna Thottethodi (PI), Vijay Pai (co-PI), Rahul Shah (co-PI), TN Vijaykumar (co-PI), Jeffrey Vitter (co-PI)
Total amount: \$889,788; Co-PI Shah's budget: \$325,000
- Space Saving String Retrieval System
Agency: Louisiana State University Summer Research Grant
Duration: July 2008
Role: PI
Amount: \$5,000

PUBLICATIONS

Notes:

- For most papers, the authors are listed in alphabetical order as is the norm in the theoretical computer science community.
- H-Index 24; Citations ~ 2235; about ~100 publications
- Best student paper award at top conference (ESA).
- Frequent area specific venues : DCC, CPM, SPIRE
- Other Major Venues: JACM, FOCS, SODA,ICALP, ESA, ISAAC, PODS, SIGMOD, ICDE, VLDB, SIGIR, INFOCOM, SPAA, Algorithmica, TCS, BMC Genomics

Journal Papers

1. Arnab Ganguly; Wing-Kai Hon; Rahul Shah; Sharma V. Thankachan, *Space-Time Trade-offs for Finding Shortest Unique Substrings and Maximal Unique Matches*, accepted with minor revision, Theoretical Computer Science (TCS), 2017.
2. Arnab Ganguly, Rahul Shah, Sharma Thankachan, *Ranked Document Retrieval with Forbidden Pattern*, with major revision to Algorithmica.
3. Wing-Kai Hon, Tak-Wah Lam, Rahul Shah, Sharma V. Thankachan, Hing-Fung Ting, Yilin Yang, *Dictionary Matching with a Bounded Gap in Pattern or in Text*, to appear in Algorithmica, published online, 2017.
4. J. Ian Munro, Gonzalo Navarro, Jesper Sindahl Nielsen, Rahul Shah, Sharma V. Thankachan, *Top-k Term-Proximity in Succinct Space*, Algorithmica 78(2), 379-393, 2017.
5. Stephane Durocher, Rahul Shah, Matthew Skala, Sharma V. Thankachan, *Linear-Space Data Structures for Range Frequency Queries on Arrays and Trees*, Algorithmica 74(1), 344-366, 2016.
6. Sudip Biswas, Manish Patil, Rahul Shah, Sharma V. Thankachan, *Succinct indexes for reporting discriminating and generic words*, Theoretical. Computer Science, 593, 165-173, 2015.
7. Wing-Kai Hon, Tsung-Han Ku, Tak Wah Lam, Rahul Shah, Siu-Lung Tam, Sharma V. Thankachan, Jeffrey Scott Vitter, *Compressing Dictionary Matching Index via Sparsification Technique*, Algorithmica 72(2), 515-538, 2015.

8. Yu-Feng Chien, Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Geometric BWT: Compressed Text Indexing via Sparse Suffixes and Range Searching*, in Algorithmica 2015.
9. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Space-Efficient Frameworks for Top-k String Retrieval*, Journal of ACM, 2014.
10. Wing-Kai Hon, Manish Patil, Rahul Shah, and Sharma V. Thankachan, *Compressed Property Suffix Trees*, in Information and Computation, 232, 10-18, 2013.
11. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Faster Compressed Dictionary Matching*, Theoretical Computer Science, 475, 113-119, 2013.
12. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Compressed text indexing with wildcards*, Journal of Discrete Algorithms, 19, 23-29, 2013.
13. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *On Position Restricted Substring Searching in Succinct Space*, Journal of Discrete Algorithms, 17, 109-114, 2012.
14. Manish Patil, Rahul Shah, Sharma V. Thankachan, *Succinct Representations of Weighted Trees Supporting Path Queries*, Journal of Discrete Algorithms, 17, 103-108, 2012.
15. Wing-Kai Hon, Tak Wah Lam, Rahul Shah, Siu-Lung Tam, Jeffrey Scott Vitter, *Cache-oblivious index for approximate string matching*, In Theoretical Computer Science, 412(29), 2011, 3579-3588.
16. M. Oguzhan Külekci, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, Bojian Xu, *PSI-RA: A parallel sparse index for read alignment on genomes*, In BMC Genomics, 12:S2, 2011,1-7.
17. Wing-Kai Hon, Manish Patil, Rahul Shah, Shih-Bin Wu, *Efficient index for retrieving top-k most frequent documents*, In Journal of Discrete Algorithms, 8(4), 2010, 402-417.
18. Yuni Xia, Sunil Prabhakar, Shan Lei, Reynold Cheng, Rahul Shah, *Indexing Constantly Changing Data with Mean-Variance Tree*, In International Journal of High Performance Computing and Networking (IJHPCN), 5(4), 2008, 263-272.
19. Ankur Gupta, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Compressed Data Structures: Dictionaries and Data-Aware Measures*, In Theoretical Computer Science (TCS), 387(3), 2007, 313-331.
20. Ihab F. Ilyas, Hicham Elmongui, Walid G. Aref, Ahmed K. Elmagarmid, Rahul Shah, Jeffrey Scott Vitter, *Adaptive Rank-aware Query Optimization in Relational Databases*, In ACM Transactions on Database Systems (TODS) 31(4), 2006, 1257-1304.
21. Rahul Shah, Martin Farach-Colton, *On the Complexity of Ordinal Clustering*, In Journal of Classification, 23(1), 2006, 79-102.
22. Rahul Shah, Zulfikar Ramzan, Ravi Jain, Raghu Dendukuri, Farooq Anjum, *Efficient Dissemination of Personalized Information Using Content-Based Multicast*, In IEEE Transactions on Mobile Computing (TMC), 3(4), 2004, 394-408.

Conference Papers

23. Arnab Ganguly, Rahul Shah, Sharma Thankachan, *Encoding Structural Suffix Trees – Succinctly*, Submitted to SPIRE 2017

24. Arnab Ganguly, Rahul Shah, Sharma Thankachan, *LF Successor: Designing a Compact Index for Order-Isomorphic Pattern Matching*, Submitted to ESA 2017
25. Arnab Ganguly, Rahul Shah, Sharma V. Thankachan, *pBWT: Achieving Succinct Data Structures for Parameterized Pattern Matching and Related Problems*, In ACM-SIAM Symposium on Discrete Algorithms (SODA), 397-407, 2017.
26. Arnab Ganguly, Wing-Kai Hon, Rahul Shah, *Stabbing Colors in One Dimension*, Data Compression Conference (DCC), 2017.
27. Arnab Ganguly, Wing-Kai Hon, Kunihiko Sadakane, Rahul Shah, Sharma V. Thankachan, Yilin Yang, *Space-Efficient Dictionaries for Parameterized and Order-Preserving Pattern Matching*, In Combinatorial Pattern Matching (CPM), 2:1-2:12, 2016.
28. Sudip Biswas, Manish Patil, Sharma V. Thankachan, Rahul Shah, *Probabilistic Threshold Indexing for Uncertain Strings*, International Conference on Extending Database Technology (EDBT), 401-412, 2016.
29. Arnab Ganguly, Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, *Space-Time Trade-Offs for the Shortest Unique Substring Problem*, International Symposium on Algorithms and Computation (ISAAC), 34:1-34:13, 2016.
30. Arnab Ganguly, Wing-Kai Hon, Rahul Shah, *A Framework for Dynamic Parameterized Dictionary Matching*, Symposium on Algorithms Theory (SWAT), 10:1-10:1, 2016.
31. Sudip Biswas, Arnab Ganguly, Rahul Shah, Sharma V. Thankachan, *Ranked Document Retrieval with Forbidden Pattern*, Combinatorial Pattern Matching (CPM), 77-88, 2015.
32. Arnab Ganguly, Rahul Shah, Sharma V. Thankachan, *Succinct Non-overlapping Indexing*, Combinatorial Pattern Matching (CPM), 185-195, 2015.
33. Wing-Kai Hon, Tak Wah Lam, Rahul Shah, Sharma V. Thankachan, Hing-Fung Ting, Yilin Yang, *Dictionary Matching with Uneven Gaps*, Combinatorial Pattern Matching (CPM), 247-260, 2015.
34. Sudip Biswas, Arnab Ganguly, Rahul Shah, *Restricted Shortest Path in Temporal Graphs*, Database and Expert Systems Applications (DEXA), (1), 13-27, 2015.
35. Sudip Biswas, Arnab Ganguly, Rahul Shah, Sharma V. Thankachan, *Forbidden Extension Queries*, Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 320-335, 2015.
36. Sudip Biswas, Manish Patil, Rahul Shah, Sharma V. Thankachan, *Shared-Constraint Range Reporting*, International Conference on Database Theory (ICDT), 277-290, 2015.
37. Umesh Chandra Satish, Praveenkumar Kondikoppa, Seung-Jong Park, Manish Patil, Rahul Shah, *MapReduce based parallel suffix tree construction for human genome*, 20th IEEE International Conference on Parallel and Distributed Systems (ICPADS), 664-670, 2014
38. J. Ian Munro, Gonzalo Navarro, Jesper Sindahl Nielsen, Rahul Shah, Sharma V. Thankachan, *Top- k Term-Proximity in Succinct Space*, International Symposium on Algorithms and Computation (ISAAC), 169-180, 2014.
39. Manish Patil, Sharma V. Thankachan, Rahul Shah, Yakov Nekrich, Jeffrey Scott Vitter, *Categorical range maxima queries*, Proceedings of the 33rd ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems, 266-277, 2014.
40. Manish Patil, Rahul Shah, *Similarity joins for uncertain strings*, International Conference on Management of Data (SIGMOD Conference), 1471-1482, 2014.
41. Sudip Biswas, Manish Patil, Rahul Shah, Sharma V. Thankachan, *Succinct Indexes for Reporting Discriminating and Generic Words*, String Processing and Information Retrieval (SPIRE), 89-100, 2014.

42. J. Ian Munro, Gonzalo Navarro, Rahul Shah, Sharma V. Thankachan, *Ranked Document Selection*, 15th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), 344-356, 2014.
43. Rahul Shah, Cheng Sheng, Sharma V. Thankachan, Jeffrey Scott Vitter, *Top-k Document Retrieval in External Memory*, European Symposium on Algorithms (ESA) 2013, 803-814.
44. Stephane Durocher, Rahul Shah, Matthew Skala, Sharma V. Thankachan, *Linear-Space Data Structures for Range Frequency Queries on Arrays and Trees*, Mathematical Foundations of Computer Science (MFCS) 2013, 325-336.
45. Manish Patil, Xuanning Cai, Sharma V. Thankachan, Rahul Shah, Seung-Jong Park, David Foltz, *Approximate String Matching by Position Restricted Alignment*, EDBT/ICDT Workshops 2013, 384-391
46. Manish Patil, Rahul Shah, Sharma V. Thankachan, *Faster Range LCP Queries*, String Processing and Information Retrieval (SPIRE) 2013, 263-270
47. Manish Patil, Rahul Shah, Sharma V. Thankachan: *Top-k Join Queries: Overcoming the Curse of Anti-Correlation*, IDEAS 2013: 76-85
48. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan: *Space-Efficient Construction Algorithm for the Circular Suffix Tree*, Combinatorial Pattern Matching (CPM) 2013, 142-152
49. Stephane Durocher, Rahul Shah, Matthew Skala, Sharma V. Thankachan: *Top-k Color Queries on Tree Paths*, String Processing and Information Retrieval (SPIRE) 2013: 109-115
50. Sudip Biswas, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan: *Position-Restricted Substring Searching over Small Alphabets*, String Processing and Information Retrieval (SPIRE) 2013, 29-36.
51. Wing-Kai Hon, Manish Patil, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter: *Indexes for Document Retrieval with Relevance*, Space-Efficient Data Structures, Streams, and Algorithms 2013, 351-362.
52. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan, *Space-Efficient Construction Algorithm for the Circular Suffix Tree*, Data Compression Conference (DCC) 2013, 496
53. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan , *Faster Compressed Document Retrieval*, Data Compression Conference (DCC) 2013, 341-350.
54. Wing-Kai Hon, Tsung-Han Ku, Chen-Hua Lu, Rahul Shah and Sharma V. Thankachan, *Efficient Algorithm for Circular Burrows-Wheeler Transform*, In Annual Symposium on Combinatorial Pattern Matching (CPM) 2012, 257-268.
55. Sharma V. Thankachan, Rahul Shah, Wing-Kai Hon and Jeffrey Scott Vitter, *Document Listing for Queries With Excluded Pattern*, In Annual Symposium on Combinatorial Pattern Matching (CPM) 2012, 185-195.
56. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, *Towards an Optimal Space-and-Query-Time Index for Top-k Document Retrieval*, In Annual Symposium on Combinatorial Pattern Matching (CPM) 2012, 173-184.
57. Manish Patil, Rahul Shah, Sharma V. Thankachan, *A Truly Dynamic Data Structure for Top-k Queries on Uncertain Data*, In International Conference on Scientific and Statistical Database Management (SSDBM) 2011, 91-108.
58. Wing-Kai Hon, C. H. Lu, Sharma V. Thankachan, and Rahul Shah, *Succinct Indexes for Circular Patterns*, In International Symposium on Algorithms and Computation (ISAAC) 2011, 673-682.
59. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Compressed Text Indexing with Wildcards*, In International Conference on String Processing and Information Retrieval (SPIRE), 2011, 267-277.

60. Manish Patil, Sharma V. Thankachan, Rahul Shah, Wing-Kai Hon, Jeffrey Scott Vitter, Sabrina Chandrasekaran, *Inverted Indexes for Phrases and Strings*, In ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR), 2011, 555-564.
61. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan and Jeffrey Scott Vitter, *Compressed Dictionary Matching with One Error*, In IEEE Data Compression Conference (DCC) 2011, 113-122.
62. Wing-Kai Hon, Manish Patil, Rahul Shah, and Sharma V. Thankachan, *Compressed Property Suffix Trees*, In IEEE Data Compression Conference (DCC) 2011, 123-132.
63. M. Oguzhan Külekci, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, Bojian Xu, *PSI-RA: A Parallel Sparse Index for Read Alignment on Genomes*, In IEEE International Conference on Bioinformatics and Biomedicine (BIBM) 2010, 663-668.
64. Wing-Kai Hon, Tsung-Han Ku, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *Faster Compressed Dictionary Matching*, In International Conference on String Processing and Information Retrieval (SPIRE) 2010, 191-200.
65. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *String Retrieval for Multi-pattern Queries*, In International Conference on String Processing and Information Retrieval (SPIRE) 2010, 55-66.
66. Sheng-Yuan Chiu, Wing-Kai Hon, Rahul Shah, and Jeffrey Scott Vitter, *I/O-Efficient Compressed Text Indexes: From Theory to Practice*, In IEEE Data Compression Conference (DCC) 2010, 426-434.
67. Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Space-Efficient Framework for Top-k String Retrieval Problems*, In IEEE Symposium on Foundations of Computer Science (FOCS) 2009, 713-722.
68. Wing-Kai Hon, Tak-Wah Lam, Rahul Shah, Siu-Lung Tam, Jeffrey Scott Vitter, *Succinct Index for Dynamic Dictionary Matching*, In International Symposium on Algorithms and Computation (ISAAC) 2009, 1034-1043.
69. Wing-Kai Hon, Rahul Shah, Shih-Bin Wu, *Efficient Index for Retrieving Top-k Most Frequent Documents*, In International Conference on String Processing and Information Retrieval, (SPIRE) 2009, 182-193.
70. Wing-Kai Hon, Rahul Shah, Sharma V. Thankachan, Jeffrey Scott Vitter, *On Entropy-Compressed Text Indexing in External Memory*, In International Conference on String Processing and Information Retrieval (SPIRE) 2009, 75-89.
71. Wing-Kai Hon, Tak Wah Lam, Rahul Shah, Siu-Lung Tam, Jeffrey Scott Vitter, *Compressed Index for Dictionary Matching*, IEEE Data Compression Conference (DCC) 2008, 23-32.
72. Yu-Feng Chien, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Geometric Burrows-Wheeler Transform: Linking Range Searching and Text Indexing*, In IEEE Data Compression Conference (DCC) 2008, 252-261.
73. Mohamed Y. Eltabakh, Wing-Kai Hon, Rahul Shah, Walid G. Aref, Jeffrey Scott Vitter, *The SBC-tree: an Index for Run-length Compressed Sequences*. In International Conference on Extending Database technology (EDBT) 2008, 523-534.
74. Sarvjeet Singh, Chris Mayfield, Rahul Shah, Sunil Prabhakar, Susanne E. Hambrusch, Jennifer Neville, Reynold Cheng, *Database Support for Probabilistic Attributes and Tuples*, In International Conference on Data Engineering, (ICDE) 2008, 1053-1061.

75. Paolo Ferragina, Roberto Grossi, Ankur Gupta, Rahul Shah, Jeffrey Scott Vitter, *On Searching Compressed String Collections Cache-obliviously*, In ACM Symposium on Principals of Database Systems (PODS) 2008, 181-190.
76. Wing-Kai Hon, Rahul Shah, Peter J. Varman, Jeffrey Scott Vitter, *Tight Competitive Ratios for Parallel Disk Prefetching and Caching*, In ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) 2008, 352-361.
77. Sarvjeet Singh, Chris Mayfield, Rahul Shah, Sunil Prabhakar, Susanne E. Hambrusch, *Query Selectivity Estimation for Uncertain Data*, In International Conference on Scientific and Statistical Database Management (SSDBM) 2008, 61-78.
78. Yinian Qi, Sarvjeet Singh, Rahul Shah, Sunil Prabhakar, *Indexing Probabilistic Nearest-Neighbor Threshold Queries*, In Joint International Workshop on Quality in Databases and Management of Uncertain Data in conjunction with VLDB 2008, 87-102.
79. Sarvjeet Singh, Chris Mayfield, Sunil Prabhakar, Rahul Shah, Susanne Hambrusch, *Indexing Uncertain Categorical Data*, In International Conference on Data Engineering (ICDE) 2007, 616-625.
80. Wing-Kai Hon, Tak-Wah Lam, Alan Tam, Rahul Shah, Jeffrey Scott Vitter, *Cache Oblivious Index for Approximate String Matching*, In Combinatorial Pattern Matching Conference (CPM) 2007, 40-51.
81. Ankur Gupta, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *A Framework for Dynamizing Succinct Data Structures*, In International Conference on Automata, Languages and Programming (ICALP) 2007, 521-532.
82. Reynold Cheng, Sarvjeet Singh, Yuni Xia, Sunil Prabhakar, Rahul Shah, Jeffrey Scott Vitter, *Efficient Join-processing over Uncertain Data*, In International Conference on Information and Knowledge Management (CIKM) 2006, 738-747.
83. Ankur Gupta, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Compressed Dictionaries: Space Measures, Data Sets and Experiments*, In Workshop on Experimental and Efficient Algorithms (WEA) 2006, 158-169.
84. Ankur Gupta, Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Compressed Data Structures: Dictionaries and Data-aware Measures*, In IEEE Data Compression Conference (DCC) 2006, 213-222.
85. Rahul Shah, Peter Varman, Jeffrey Scott Vitter, *On the Online Read-many Parallel Disks Scheduling*, In ACM Symposium on Parallelism in Algorithms and Architecture (SPAA), 2005, 217.
86. Yuni Xia, Sunil Prabhakar, Shan Lei, Reynold Cheng, Rahul Shah, *Indexing Constantly Changing Data with Mean-Variance Tree*, In ACM Symposium on Applied Computing (SAC) 2005, 1125-1132.
87. Reynold Cheng, Yuni Xia, Sunil Prabhakar, Rahul Shah, *Change Tolerant Indexing for Constantly Evolving Data*, In international conference on Data Engineering (ICDE) 2005, 391-402.
88. Reynold Cheng, Yuni Xia, Sunil Prabhakar, Rahul Shah, Jeffrey Scott Vitter, *Efficient Indexing Methods for Probabilistic Threshold Queries over Uncertain Data*, In International Conference on Very Large Databases (VLDB) 2004, 876-887.
89. Rahul Shah, Peter J. Varman, Jeffrey Scott Vitter, *Online Algorithms for Prefetching and Caching on Parallel Disks*, In ACM Symposium on Parallelism in Algorithms and Architecture (SPAA) 2004, 255-264.
90. S. Muthukrishnan, Rahul Shah, Jeffrey Scott Vitter, *Mining Deviants in Time Series Data Streams*, In International Conference on Scientific and Statistical Database Management (SSDBM) 2004, 41-50.

91. Ihab F. Ilyas, Rahul Shah, Walid G. Aref, Jeffrey Scott Vitter, Ahmed K. Elmagarmid, *Rank Aware Query Optimization*, In International Conference on Management of Data (SIGMOD) 2004, 203-214.
92. Thanaa Ghanem, Rahul Shah, Mohammed F. Mokbel, Walid Aref, Jeffrey Scott Vitter, *Bulk Operations for Space Partitioning Trees*, In International Conference on Data Engineering (ICDE) 2004, 29-40.
93. Rahul Shah, Farooq Anjum, Ravi Jain, *Efficient Dissemination of Personalized Information Using Content-Based Multicast*, In 21st Joint Conference of IEEE Computer and Communications Societies (InfoCom) 2002.
94. Rahul Shah, Martin Farach-Colton, *Undiscretized Dynamic Programming: Faster Algorithms for Facility Location and Related Problems on Trees*, In ACM-SIAM symposium on Discrete Algorithms (SODA) 2002, 108-115.
95. Stefan Langerman, Sachin Lodha, Rahul Shah, *Algorithms for Efficient Filtering in Content-Based Multicast*, In European Symposium on Algorithms (ESA) 2001, **Winner of Best Student Paper award**, 428-439.
96. Rahul Shah, Martin Farach-Colton, *On the Midpath Tree Conjecture: a Counter-Example*, In ACM-SIAM Symposium on Discrete Algorithms (SODA) 2001, 208-209.

Other Publications (Non-Peer Reviewed): Book Chapters/Surveys/Plenary/Tech Reports

1. Rahul Shah, Document Retrieval on String Collections, Encyclopedia of Algorithms, 2016.
2. Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Compression, Indexing, and Retrieval for Massive String Data*, Plenary Paper in International Conference on Combinatorial Pattern Matching (CPM), 2010, 260-274.
3. Sunil Prabhakar, Rahul Shah, and Sarveer Singh, *Indexing Uncertain Data*, In Managing and Mining Uncertain Data, Charu Aggarwal ed. (Springer), Book Chapter, 2009.
4. Wing-Kai Hon, Rahul Shah, Jeffrey Scott Vitter, *Ordered Pattern Matching: Towards Full-Text Retrieval*, CS TR #06-013, Dept. of Computer Science, Purdue University.
5. Rahul Shah, *Faster Algorithms for the k-Median Problem on Trees with Smaller Heights*, CS TR #03-030, Dept. of Computer Science, Purdue University.

Demonstrations

1. Sarveer Singh, Chris Mayfield, Sagar Mittal, Sunil Prabhakar, Susanne E. Hambrusch, Rahul Shah, *Orion 2.0: Native Support for Uncertain Data*, ACM SIGMOD International Conference on Management of Data (Demo), 2008, 1239-1242.
2. Sarveer Singh, Chris Mayfield, Sagar Mittal, Sunil Prabhakar, Susanne E. Hambrusch, Rahul Shah: *The Orion Uncertain Data Management System*. COMAD (Demo) (2008) 273-276.

Invited Talks

1. Parameterized Burrows-Wheeler Transform, Dagstuhl, Germany 2016
2. Parameterized Text Indexing – Succinctly, Axa Workshop 2016 – Venice, Italy
3. Parameterized Burrows-Wheeler Transform, Univ. Maryland 2016—College Park, MD
4. Compact indexes for parameterized pattern matching and related problems, Tulane University 2016
5. Compact indexes for parameterized pattern matching and related problems, IIT Mumbai 2015
6. Indexes for Document Retrieval with Relevance, NSF 2014 – Arlington, VA
7. Document Retrieval in External Memory, Dagstuhl, Germany 2013

8. Space-Efficient Frameworks for Top-K String Retrieval, Bar-Elan University, 2010
9. Compression Indexing and Retrieval for Massive String Data, Purdue University, 2010
10. Space-Efficient Frameworks for Top-K String Retrieval, Microsoft Research, 2010
11. On Searching Compressed String Collections Cache-Obliviously, Workshop on Compression, Strings and Algorithms, Finland, 2009
12. Modeling Uncertain Database Systems, Texas A&M Parasol Seminar, 2009

Theses/Projects

- Rahul Shah, *Undiscretized Dynamic Programming and Ordinal Embeddings*, PhD Thesis, Rutgers University, 2002. (Committee: Martin Farach-Colton (chair), S. Muthukrishnan, Sampath Kannan, Vasek Chvatal)
- Rahul Shah, *Optimization Problems in SONET/WDM Ring Architecture*, Master's Essay, Rutgers University, 1998. (Advisor: Vasek Chvatal)
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