

# QIN ZHANG

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- RESEARCH INTERESTS ◇ Algorithms for massive data; data streams; algorithms on distributed data; data structures; external memory algorithms; database algorithms; communication complexity.
- POSITIONS ◇ Center for Massive Data Algorithmics, Aarhus University, Aarhus, Denmark August 2010 – Now  
Postdoctoral Associate  
Advisor: Prof. Lars Arge
- EDUCATION ◇ Hong Kong University of Science and Technology, P. R. China September 2006 – July 2010  
Ph.D. in Computer Science and Engineering, July 2010  
Thesis title: *Communication-efficient Algorithms for Tracking Distributed Data Streams*.  
Advisor: Prof. Mordecai Golin and Dr. Ke Yi
- ◇ Fudan University, Shanghai, P. R. China September 2002 – July 2006  
B.Sc. in Computer Science, July 2006  
GPA: top 5%
- WORK EXPERIENCE ◇ Lecturer, Department of CS, Aarhus University. Streaming Algorithms. Spring 2011
- ◇ Teaching Assistant, Department of CSE, HKUST. Fall 2006 – Spring 2010  
For courses: Discrete Mathematics, Combinatorial Optimization, Design and Analysis of Algorithms, Computational Geometry
- ◇ Internship, Max-Planck-Institut für Informatik, Saarbrücken, Germany Summer, 2006
- INVITED JOURNAL PAPERS ◇ Optimal Sampling From Distributed Streams. G. Cormode, S. Muthukrishnan, K. Yi and Q. Zhang\*. To appear in *Journal of the ACM (JACM)*, accepted in June 2011.
- JOURNAL PAPERS ◇ Optimal Tracking of Distributed Heavy Hitters and Quantiles. K. Yi and Q. Zhang\*. To appear in *Algorithmica*, accepted in October 2011.
- ◇ Multi-Dimensional Online Tracking. K. Yi and Q. Zhang\*. To appear in *ACM Transactions on Algorithms (TALG)*, accepted in July 2010.

**Note:** All papers (above and below) marked with \* use alphabetic ordering of authors, following the convention of theoretical computer science.

# QIN ZHANG

- CONFERENCE PAPERS
- ◇ Tight Bounds for Distributed Functional Monitoring. D. P. Woodruff and Q. Zhang\*. *In Proceedings of the 44th ACM Symposium on Theory of Computing (STOC 12)*, to appear. New York, NY, U.S.A., May 2012.
  - ◇ Lower Bounds for Number-in-Hand Multiparty Communication Complexity, Made Easy. J. M. Phillips, E. Verbin and Q. Zhang\*. *In Proceedings of the 23th ACM-SIAM Symposium on Discrete Algorithms (SODA 12)*, pages 486-501. Kyoto, Japan. January 2012.
  - ◇ Sorting, Searching and Simulation in the MapReduce Framework. M. T. Goodrich, N. Sitchinava and Q. Zhang\*. *In Proceedings of the 22th International Symposium on Algorithms and Computation (ISAAC 11)*, pages 374-383. Yokohama, Japan. December 2011.
  - ◇ Edit Distance to Monotonicity in Sliding Windows. H. L. Chan, T. W. Lam, L. K. Lee, J. Pan, H. F. Ting and Q. Zhang\*. *In Proceedings of the 22th International Symposium on Algorithms and Computation (ISAAC 11)*, pages 564-573. Yokohama, Japan. December 2011.
  - ◇ Clustering with Diversity. J. Li, K. Yi and Q. Zhang\*. *In Proceedings of the 37th International Colloquium on Automata, Languages and Programming (ICALP 10)*, pages 188-200. Bordeaux, France, July 2010.
  - ◇ Cache-Oblivious Hashing. R. Pagh, Z. Wei, K. Yi and Q. Zhang\*. *In Proceedings of the 29th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 10)*, pages 297-304. Indianapolis, IN, U.S.A., June 2010.
  - ◇ Optimal Sampling From Distributed Streams. G. Cormode, S. Muthukrishnan, K. Yi and Q. Zhang\*. *In Proceedings of the 29th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 10)*, pages 77-86. Indianapolis, IN, U.S.A., June 2010.
  - ◇ The Limits of Buffering: A Tight Lower Bound for Dynamic Membership in the External Memory Model. E. Verbin and Q. Zhang\*. *In Proceedings of the 42nd ACM Symposium on Theory of Computing (STOC 10)*, pages 447-456. Cambridge, MA, U.S.A., June 2010.
  - ◇ On the Cell Probe Complexity of Dynamic Membership. K. Yi and Q. Zhang\*. *In Proceedings of the 21st ACM-SIAM Symposium on Discrete Algorithms (SODA 10)*, pages 123-133. Austin, TX, U.S.A., January 2010.
  - ◇ Dynamic External Hashing: The Limit of Buffering. Z. Wei, K. Yi and Q. Zhang\*. *In Proceedings of the 21st ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 09)*, pages 253-259. Calgary, Canada, August 2009.
  - ◇ Optimal Tracking of Distributed Heavy Hitters and Quantiles. K. Yi and Q. Zhang\*. *In Proceedings of the 28th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 09)*, pages 167-174. Providence, RI, U.S.A., June - July 2009.
  - ◇ Revenue Generation for Truthful Spectrum Auction in Dynamic Spectrum Access. J. Jia, Q. Zhang, Q. Zhang and M. Liu. *In Proceedings of the 10th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 09)*, pages 3-12. New Orleans, LA, U.S.A., May 2009.
  - ◇ Multi-Dimensional Online Tracking. K. Yi and Q. Zhang\*. *In Proceedings of the 20th ACM-SIAM Symposium on Discrete Algorithms (SODA 09)*, pages 1098-1107. New York, NY, U.S.A., January 2009.
  - ◇ Finding Frequent Items in Probabilistic Data. Q. Zhang, F. Li, K. Yi. *In Proceedings of the 27th ACM SIGMOD International Conference on Management of Data (SIGMOD 08)*, pages 819-832. Vancouver, Canada, June 2008.
- PAPERS IN SUBMISSION
- ◇ Randomized Algorithms for Tracking Distributed Count, Frequencies, and Ranks. Z. Huang, K. Yi, and Q. Zhang\*. Submitted to *PODS 2012*. Preliminary version in <http://arxiv.org/abs/1108.3413>

# QIN ZHANG

- ◇ Rademacher-Sketch: A Dimensionality-Reducing Embedding for Sum-Product Norms, with an Application to Earth-Mover Distance. E. Verbin and Q. Zhang\*. To be submitted to *ICALP* 2012.

## HONORS

- ◇ ACM travel grant and HKUST travel grant, for STOC 2010.
- ◇ Microsoft travel grant and HKUST travel grant, for SODA 2010.
- ◇ ACM travel grant, for SPAA 2009.
- ◇ HKUST travel grant, for SIGMOD 2008.
- ◇ HKUST Ph.D. Scholarship, 2006 – 2010, Annual.
- ◇ Scholarship of Fudan University  
2002 – 03: Third Prize. 2003 – 04: Second Prize. 2004 – 05: First Prize. 2005 – 06: Second Prize.
- ◇ *Fudi* Scholarship for University Study, 2002 – 2006, Annual.
- ◇ Gold Medal in National Olympiad in Mathematics, 2002
- ◇ Silver Medal in National Olympiad in Mathematics, 2001

## PATENTS

- ◇ AT&T / 2009-1377 "Methods for Drawing a Sample from Distributed Data Streams". With G. Cormode and K. Yi.

## GRANTS

- ◇ "Data Structure Complexity in Data Streams and MapReduce Models". With Yitong Yin (Nanjing University, China). January, 2011.

## EXTERNAL TALKS

- ◇ "Tight Bounds for Distributed Functional Monitoring", at NII Shonan Meeting on "Large-scale Distributed Computation". NII, Japan. January, 2012.
- ◇ "Distributed Streaming", at IT University of Copenhagen, Copenhagen, Denmark. December, 2011. Also at Jiao Tong University, Shanghai, China. January, 2012.
- ◇ "Sorting, Searching and Simulation in the MapReduce Framework", at MSRA, Beijing, China. January, 2012.
- ◇ "Rademacher-Sketch: A Dimensionality-Reducing Embedding for Sum-Product Norms, with an Application to Earth-Mover Distance", at IIS, Tsinghua University, Beijing, China. January, 2012.
- ◇ "Lower Bounds for Number-in-Hand Multiparty Communication Complexity", at Workshop: Synergies in Lower Bounds, Aarhus, Denmark. June, 2011. Also at LIAFA, Paris, France. October, 2011. And at SODA 2012, Kyoto, Japan. January, 2012.
- ◇ "Optimal Sampling from Distributed Streams", at Microsoft Research Asia, Beijing, China. September, 2010.
- ◇ "External Memory Data Structures with  $o(1)$ -I/O Updates", at China Theory Week (invited), Tsinghua University, Beijing, China. September, 2010.
- ◇ "Clustering with Diversity", at Univ. of Hong Kong, Hong Kong, China. June, 2010. Also at Jiao Tong University, Shanghai, China. July, 2010.
- ◇ "On the Cell Probe Complexity of Dynamic Membership", at SODA '10, Austin, TX, U.S.A. January, 2010. Also at Fudan University, Shanghai, China. September, 2009.
- ◇ "Dynamic External Hashing: The Limit of Buffering", at SPAA '09, Calgary, Canada. August, 2009. Also at AAAC '09, Hangzhou, China. April, 2009.
- ◇ "Dynamic Dictionary and Membership", at Microsoft Research Asia, Beijing, China. July, 2009.

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- ◇ “Optimal Tracking of Distributed Heavy Hitters and Quantiles”, at PODS ’09, Providence, RI, U.S.A. June, 2009.
- ◇ “Multi-Dimensional Online Tracking”, at SODA ’09, New York, U.S.A. January, 2009.
- ◇ “Finding Frequent Items in Probabilistic Data”, at SIGMOD ’08, Vancouver, Canada. June 2008.
- ◇ “Shannon Coding for the Discrete Noiseless Channel and Related Problems”, at AAAC ’08, Hong Kong, China. April, 2008.
- ◇ “The Art of Metric Embeddings”, at University of Leicester, UK. August, 2007.

SERVICES ◇ Reviewer for conferences: *STOC, SODA, PODS, SoCG, ICALP, EC, STACS, WINE, SIGMOD*.  
◇ Reviewer for journals: *TALG, TKDE*.

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