

# Phillip B. Gibbons

## Curriculum Vitae

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April 2012

## Research Interests

Research areas include parallel computing, databases/data-intensive systems, cloud computing, sensor networks, distributed systems, and computer architecture. My publications span theory and systems, across a broad range of computer science (e.g., papers in ASPLOS, CIDR, EuroSys, JFP, PLDI, PODC, PPOPP, SIGMOD, SPAA, ToN, and VLDBJ since 2010).

## Education

- **University of California at Berkeley**, Berkeley, California, 1984–1989.  
Ph.D. in Computer Science. Dissertation advisor: Richard M. Karp.
- **Dartmouth College**, Hanover, New Hampshire, 1979–1983.  
B.A. in Mathematics. Graduated summa cum laude and Phi Beta Kappa.

## Professional Experience

- **Intel Labs Pittsburgh**, Pittsburgh, Pennsylvania. Principal Research Scientist, 2001–present.  
Principal Investigator for the Intel Science and Technology Center for Cloud Computing (2011–present)
  - A \$15M research partnership with Carnegie Mellon, Georgia Tech, Princeton, and UC Berkeley.Principal Investigator (PI or co-PI) for the following research projects:
  - *Hi-Spade*: Hierarchy-savvy parallel algorithm and system design, focusing on high-level locality abstractions, smart runtime thread schedulers, and emerging non-volatile memory technologies.
  - *LBA*: Hardware accelerators for online program correctness checking tools.
  - *Sybil Defenses*: Limiting the impact of malicious users in distributed systems.
  - *IrisNet (2002-2005)*: A core architecture and software infrastructure for a worldwide sensor web.
- **Carnegie Mellon University**, Pittsburgh, Pennsylvania.  
Adjunct Professor, Computer Science Department, July 2003–present.  
Adjunct Associate Professor, Computer Science Department, July 2000–June 2003.  
Visiting Professor, Computer Science Department, January–June 2000.
- **University of Pittsburgh**, Pittsburgh, Pennsylvania.  
Adjunct Professor, Department of Computer Science, 2003–present.
- **Bell Laboratories**, Murray Hill, New Jersey. Member of Technical Staff, 1990–2001.  
Information Sciences Research Center, Bell Laboratories, Lucent Technologies, 1996–2001.  
Mathematical Sciences Research Center, AT&T Bell Laboratories, 1990–1996.  
Principal Investigator (PI or co-PI) for the following research projects (partial list):
  - *Aqua*: Synopses and approximate query processing for massive data sets/streams.
  - *Compas*: Improved modeling, algorithm design, and performance for parallel processing.
  - *LPWA*: Browse the web with greater privacy, convenience, and spam control.

- **Stanford University**, Palo Alto, California. Postdoctoral scholar, September 1989 – August 1990. Department of Computer Science and the Computer Systems Laboratory. Sponsors: John L. Hennessy, Donald E. Knuth, Jeffrey D. Ullman.
- **Internships and Assistantships:**  
*IBM Almaden Research Center*, San Jose, California. April 1988 – August 1989.  
*University of California at Berkeley*, Berkeley, California. September 1984 – August 1989.  
*Dartmouth College*, Hanover, New Hampshire. January–March 1984.  
*Hewlett Packard Laboratories*, Palo Alto, California. June–December 1983, Summer 1984, 1985.  
*Digital Equipment Corporation*, Tewksbury, Massachusetts. January–March 1982, Summer 1982.

## Summary of Honors and Impact Indicators

- **ACM Fellow**
- **Best Papers:** Most influential paper lists for ISCA and PLDI. Award winning papers in ISCA'08, NSDI'06, ICDE'04, and SIGMOD'01. Papers in ICFP'08, VLDB'08, PODC'07, SIGCOMM'06, SIGMOD'02, SPAA'02, SPAA'01, PODS'99, SPAA'99, SPAA'97, Euro-Par'96, SPAA'95, and SPAA'94 selected for “best paper” journal issues.
- **Editorial Boards:** *Journal of the ACM*, *IEEE Transactions on Computers*, and *IEEE Transactions on Parallel and Distributed Systems*.
- **Program Committees:** 50+ program committees. Chair/Co-Chair/Vice Chair for ICDE'09, SenSys'07, DCOSS'06, IPSN'06, ICDE'05, and SPAA'98. Steering Committee Chair for SPAA 2004–2007. Steering Committee for SenSys and DCOSS.
- **Keynote talks:** SDM'10, SenSys'08, DISC'08, and DCOSS'05.
- **Citation counts** [*source: Google Scholar*]: 10,000+ citations. H-Index = 54 (top Intel score). 27 papers with over 100 citations.
- **Commercial impact of papers:** Pipeline scheduler used in Hewlett-Packard's first RISC processors throughout the late '80s. Memory consistency model used in commercial parallel machines since the early '90s. Probabilistic data summaries used in commercial data warehouses since the late '90s and in network monitoring since the early '00s. Approximate query processing techniques used by leading database vendors since the late '90s. 17 Patents.

## Professional Activities

- Editorial Board: *Journal of the ACM*, 2001–present
- Editorial Board: *IEEE Transactions on Computers*, 2005–2007
- Editorial Board: *Parallel Processing Letters*, 2001–2006
- Editorial Board: *IEEE Transactions on Parallel and Distributed Systems*, 1997–2000
- General Co-Chair: *9th International ACM Workshop on Data Engineering for Wireless and Mobile Access (MobiDE'10)*
- Program Vice-Chair: *25th IEEE International Conference on Data Engineering (ICDE'09)*, program co-chair for the “Ubiquitous, Mobile, Distributed, and Peer-to-Peer Databases” track
- Program Co-Chair: *ImageSense'08: Workshop on Applications, Systems, and Algorithms for Image Sensing (ImageSense'08)*

- Program Co-Chair: *5th ACM International Conference on Embedded Networked Sensor Systems (SenSys'07)*
- Program Chair: *2nd IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS'06)*
- Program Co-Chair: *5th IEEE/ACM International Symposium on Information Processing in Sensor Networks (IPSN'06)*
- Program Vice-Chair: *21st IEEE International Conference on Data Engineering (ICDE'05)*, program chair for the “Stream Processing, Continuous Queries and Sensor Databases” track
- Program Chair: *10th ACM Symposium on Parallel Algorithms and Architectures (SPAA'98)*
- Steering Committee Chair: *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2003–2007.
- Steering Committee Member: *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2000–present
- Steering Committee Member: *ACM International Conference on Embedded Networked Sensor Systems (SenSys)*, 2007–2010
- Steering Committee Member: *IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS)*, 2004–present
- Demos Co-Chair: *3rd ACM International Conference on Embedded Networked Sensor Systems (SenSys'05)*
- Program Committee Member for:
  - *1st IEEE International Conference on Cloud Engineering (I2CE'13)*
  - *13th ACM/IFIP/USENIX International Conference on Middleware (MIDDLEWARE'12)*
  - *38th International Conference on Very Large Databases (VLDB'12)*
  - *39th EATCS International Colloquium on Automata, Languages and Programming (ICALP'12)*
  - *8th ACM International Workshop on Data Management on New Hardware (DaMoN'12)*
  - *ACM SIGMOD International Conference on Management of Data (SIGMOD'12)*
  - *31st ACM Symposium on Principles of Database Systems (PODS'12)*, External Review Committee
  - *11th IEEE International Conference on Data Mining (ICDM'11)*
  - *30th ACM Symposium on Principles of Distributed Computing (PODC'11)*
  - *35th ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS'11)*
  - *16th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'11)*, External Review Committee
  - *8th ACM International Conference on Embedded Networked Sensor Systems (SenSys'10)*
  - *37th EATCS International Colloquium on Automata, Languages and Programming (ICALP'10)*
  - *ACM SIGMOD International Conference on Management of Data (SIGMOD'10)*
  - *9th IEEE/ACM International Conference on Information Processing in Sensor Networks (IPSN'10)*
  - *12th SIAM Workshop on Algorithm Engineering & Experiments (ALENEX'10)*
  - *29th IEEE International Conference on Distributed Computing Systems (ICDCS'09)*
  - *25th IEEE International Conference on Data Engineering (ICDE'09)*
  - *ImageSense'08: Workshop on Applications, Systems, and Algorithms for Image Sensing (ImageSense'08)*

- *6th ACM International Conference on Embedded Networked Sensor Systems (SenSys’08)*
  - *22nd International Symposium on Distributed Computing (DISC’08)*
  - *34th International Conference on Very Large Databases (VLDB’08)*
  - *32nd ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS’08)*
  - *7th IEEE/ACM International Symposium on Information Processing in Sensor Networks (IPSN’08)*
  - *5th ACM International Conference on Embedded Networked Sensor Systems (SenSys’07)*
  - *33rd International Conference on Very Large Databases (VLDB’07)*
  - *ACM SIGMOD International Conference on Management of Data (SIGMOD’07)*
  - *23rd IEEE International Conference on Data Engineering (ICDE’07)*
  - *4th ACM International Conference on Embedded Networked Sensor Systems (SenSys’06)*
  - *ACM SIGMOD International Conference on Management of Data (SIGMOD’06)*
  - *2nd IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS’06)*
  - *5th IEEE/ACM International Symposium on Information Processing in Sensor Networks (IPSN’06)*
  - *26th IEEE Real-Time Systems Symposium (RTSS’05)*
  - *11th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD’05)*
  - *1st ACM International Workshop on Data Management on New Hardware (DaMoN’05)*
  - *IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS’05)*, systems track
  - *21st IEEE International Conference on Data Engineering (ICDE’05)*
  - *International Workshop on Data Management for Sensor Networks (DMSN’04)*
  - *16th Scientific and Statistical Database Management Conference (SSDBM’04)*
  - *20th IEEE International Conference on Data Engineering (ICDE’04)*
  - *IEEE International Parallel and Distributed Processing Symposium (IPDPS’04)*
  - *3rd International ACM Workshop on Data Engineering for Wireless and Mobile Access (MobiDE’03)*
  - *ACM SIGMOD International Conference on Management of Data (SIGMOD’03)*
  - *Workshop on Management and Processing of Data Streams (MPDS’03)*
  - *15th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA’03)*
  - *IEEE International Parallel and Distributed Processing Symposium (IPDPS’02)*
  - *13th ACM Symposium on Parallel Algorithms and Architectures (SPAA’01)*
  - *IEEE International Parallel and Distributed Processing Symposium (IPDPS’00)*
  - *31st ACM Symposium on the Theory of Computing (STOC’99)*
  - *10th ACM Symposium on Parallel Algorithms and Architectures (SPAA’98)*
  - *International Symposium on Parallel Architectures, Algorithms and Networks (ISPAN’97)*
  - *8th ACM Symposium on Parallel Algorithms and Architectures (SPAA’96)*
  - *10th IEEE International Parallel Processing Symposium (IPPS’96)*
  - *7th IEEE Symposium on Parallel and Distributed Processing (SPDP’95)*
  - *9th IEEE International Parallel Processing Symposium (IPPS’95)*
  - *6th IEEE Symposium on Parallel and Distributed Processing (SPDP’94)*
  - *5th IEEE Symposium on Parallel and Distributed Processing (SPDP’93)*
- Best Paper Committee Member: *33rd International Conference on Very Large Databases (VLDB’07)*

- Best Paper Committee Member: *ACM SIGMOD International Conference on Management of Data (SIGMOD'07)*
- Demo Committee Member: *19th IEEE International Conference on Data Engineering (ICDE'03)*
- Co-organizer: *NSF Workshop on Research Directions in the Principles of Parallel Computing*, 2012
- Co-organizer: *NSF Workshop on Algorithms in the Field*, 2011
- Co-organizer: *DIMACS Workshop on Parallelism: A 2020 Vision*, 2011
- Co-organizer: *NSF Workshop on Enabling Data-Intensive Computing: from Systems to Applications*, 2009
- Organizer: *1st SPAA Revue* workshop, held in conjunction with SPAA'97
- Co-editor: *Theory of Computing Systems* (formerly *Mathematical Systems Theory*), special issue for selected papers from SPAA'96
- Lead organizer: *DIMACS Workshop on Models, Architectures, and Technologies for Parallel Computation*, 1993
- Intel's representative on the ACM Computer Science Teacher's Association (CSTA) Advisory Council (2005–present)
- Intel's representative on the Computing in the Core Coalition (2010–2011)
- Referee for hundreds of papers for a wide range of journals  
Reviewer/Panelist for numerous grant proposals for various funding agencies
- Professional Society Memberships:
  - Association for Computing Machinery (ACM), including the SIGACT, SIGARCH, SIGMOD and SIGPLAN special interest groups
  - Institute of Electrical and Electronics Engineers (IEEE), including the IEEE Computer Society
  - Society for Industrial and Applied Mathematics (SIAM)

## Honors

- *Fellow of the ACM*, inducted in 2006
- Winner, **The Yossi Levy Prize** in Operations Research and Managerial Economics, sponsored by the Operations Research Society of Israel, 1999: Best journal paper award for 1999, for the article *Testing Shared Memories*, by P. B. Gibbons and E. Korach
- *Efficient Instruction Scheduling for a Pipelined Architecture*, by P. B. Gibbons and S. S. Muchnick, was selected as one of the **50 most influential papers** in the first 20 years of the *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 2002
- *Memory Consistency and Event Ordering in Scalable Shared-Memory Multiprocessors*, by K. Gharachorloo, D. Lenoski, J. Laudon, P. Gibbons, A. Gupta and J. Hennessy, was one of 41 papers selected as the **most influential papers** in the first 25 years of the *ACM International Symposium on Computer Architecture (ISCA)*, 1998
- *Flexible Hardware Acceleration for Instruction-Grain Program Monitoring*, by S. Chen, M. Kozuch, T. Strigkos, B. Falsafi, P. Gibbons, T. Mowry, V. Ramachandran, M. Ryan, O. Ruwase and E. Vlachos, was selected for **IEEE Micro's Top Picks from the 2008 Computer Architecture Conferences**

- *Availability of Multi-Object Operations*, by H. Yu, P. B. Gibbons and S. Nath, was co-winner of the **best paper** award for the *3rd USENIX Symposium on Networked Systems Design and Implementation (NSDI'06)*
- *Improving Hash Join Performance through Prefetching*, by S. Chen, A. Ailamaki, P. B. Gibbons and T. C. Mowry, was co-winner of the **best paper** award for the *20th IEEE International Conference on Data Engineering (ICDE'04)*
- *A Distributed Filtering Architecture for Multimedia Sensors*, by S. Nath, Y. Ke, P. B. Gibbons, B. Karp and S. Seshan, won the **best paper** award for the *1st IEEE Workshop on Broadband Advanced Sensor Networks (BaseNets'04)*
- *Improving Index Performance through Prefetching*, by S. Chen, P. B. Gibbons and T. C. Mowry, was awarded **runner-up best paper** in the *2001 ACM SIGMOD International Conference on Management of Data (SIGMOD'01)*
- Best paper journal issues: Co-authored paper in **ICFP'08, VLDB'08, PODC'07, SIGCOMM'06, SIGMOD'02, SPAA'02, SPAA'01, PODS'99, SPAA'99, SPAA'97, Euro-Par'96, SPAA'95, and SPAA'94** that were each selected for inclusion in a special “best papers” journal issue for its respective conference.
- Keynote speaker at the *10th SIAM International Conference on Data Mining (SDM'10)*
- Keynote speaker at the *6th ACM International Conference on Embedded Networked Sensor Systems (SenSys'08)*
- Keynote speaker at the *22nd International Symposium on Distributed Computing (DISC'08)*
- Keynote speaker at the *3rd IEEE/CreateNet International Workshop on Broadband Advanced Sensor Networks (BaseNets'06)*
- Keynote speaker at the *IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS'05)*
- Invited speaker at the AT&T Shannon Labs, Boston University, Brown University, Cornell University, Dartmouth College, Lawrence Livermore Laboratories, MIT, National Taiwan University, New York University, Rutgers University, Stanford University, the University of California at Los Angeles, the University of Maryland, the University of Texas at Austin, Washington University in St. Louis, Yale University, and the following international and/or invitation-only workshops:
  - NSF Workshop on Algorithms in the Field (Piscataway, NJ, 2011)
  - NSF Workshop on Sustainable Energy Efficient Data Management (Arlington, VA, 2011)
  - Workshop on Theory and Many-Cores (College Park, MD, 2009)
  - Data Intensive Computing Symposium (Sunnyvale, CA, 2008)
  - University of Washington / Microsoft Research Summer Institute on the World-Wide Sensor Web (Blaine, WA, 2006)
  - Workshop on Space-Conscious Algorithms (Bertinoro, Italy, 2006)
  - Radcliffe Institute Workshop on Programming Myriads: Investigating Programming Abstractions and Languages for Sensor Networks (Cambridge, MA, 2004)
  - DIMACS Working Group on Streaming Data Analysis II (2003)
  - Workshop on Parallelism in Algorithms and Architectures (Paderborn, Germany, 2003)
  - Universität Marburg Symposium on Managing and Analyzing Data Streams (Germany, 2002)
  - DIMACS Workshop on Streaming Data Analysis and Mining (2001)
  - DIMACS Workshop on Sublinear Algorithms

- DIMACS Workshop on External Memory Algorithms and Visualization
- DIMACS Workshop on Distributed Data and Structures (two talks)
- ICPP Workshop on Challenges for Parallel Processing
- DIMACS Workshop on Organizing and Moving Data in Parallel Machines
- DIMACS Workshop on Parallel Algorithms: From Solving Combinatorial Problems to Solving Grand Challenges Problems
- DIMACS Workshop on Models, Architectures, and Technologies for Parallel Computation
- DIMACS Workshop on Parallel Algorithms for Unstructured and Dynamic Problems
- ACM Workshop on Parallel Algorithms (San Diego, 1993)
- Invited panelist for **INSS’09** panel on sensor networks, 2009.  
Invited panelist for **SIGMOD’02** panel on data streams, 2002.  
Invited panelist for ACM Workshop on Parallel Algorithms, 1993.
- Awarded IBM Predoctoral Fellowship, 1986-1987
- Graduated Summa Cum Laude (top 10%) and Phi Beta Kappa, Dartmouth College, 1983
- Winner, Thayer Mathematics Prize for the year 1980, Dartmouth College

## Book Chapters and Proceedings

- P. B. Gibbons.  
**Distinct-Values Estimation over Data Streams.**  
Invited book chapter for *Data Stream Management: Processing High-Speed Data Streams*, M. Garofalakis, J. Gehrke, R. Rastogi (Eds.), Springer, 2011, to appear.
- P. B. Gibbons, D. Zeinalipour-Yazti, H. Lei, and S. Nath (Eds.).  
**Proceedings of the 9th ACM International Workshop on Data Engineering for Wireless and Mobile Access, MobiDE 2010.**  
Indianapolis, IN, ACM, June 2010.
- S. Jha, P. B. Gibbons and A. Ledeczi (Eds.).  
**SenSys’07: Proceedings of the 5th ACM Conference on Embedded Networked Sensor Systems.**  
Sydney, Australia, ACM, November 2007.
- P. B. Gibbons and C. Scheideler (Eds.).  
**SPAA 2007: Proceedings of the 19th Annual ACM Symposium on Parallelism in Algorithms and Architectures.**  
San Diego, CA, ACM, June 2007.
- P. B. Gibbons and U. Vishkin (Eds.).  
**SPAA 2006: Proceedings of the 18th Annual ACM Symposium on Parallelism in Algorithms and Architectures.**  
Cambridge, MA, ACM, July-August 2006.
- P. B. Gibbons, T. F. Abdelzaher, J. Aspnes and R. Rao (Eds.).  
**Proceedings of the 2nd IEEE International Conference on Distributed Computing in Sensor Systems.**  
San Francisco, CA, Springer, June 2006.
- J. A. Stankovic, P. B. Gibbons, S. B. Wicker and J. A. Paradiso (Eds.).  
**Proceedings of the 5th International Conference on Information Processing in Sensor Networks.**  
Nashville, TN, ACM, April 2006.

- P. B. Gibbons and P. G. Spirakis (Eds.).  
**SPAA 2005: Proceedings of the 17th Annual ACM Symposium on Parallelism in Algorithms and Architectures.**  
Las Vegas, NV, ACM, July 2005.
- P. B. Gibbons and M. Adler (Eds.).  
**SPAA 2004: Proceedings of the 16th Annual ACM Symposium on Parallelism in Algorithms and Architectures.**  
Barcelona, Spain, ACM, June 2004.
- S. S. Muchnick and P. B. Gibbons.  
**Retrospective: Efficient Instruction Scheduling for a Pipelined Architecture.**  
In *20 Years of the ACM SIGPLAN Conference on Programming Language Design and Implementation (1979-1999): A Selection*, K. S. McKinley (Ed.), ACM, 2004, pp. 167–174. Retrospectives on the 50 most influential papers in the first 20 years of PLDI.
- P. B. Gibbons and Y. Matias.  
**Synopsis Data Structures for Massive Data Sets.**  
Invited book chapter for *External Memory Algorithms*, J. M. Abello and J. S. Vitter (Eds.), DIMACS Series in Discrete Mathematics and Theoretical Computer Science, American Mathematical Society, 50 (1999).
- P. B. Gibbons, R. M. Karp, C. E. Leiserson and G. M. Papadopoulos (Eds.).  
**Proceedings of the DIMACS Workshop on Models, Architectures, and Technologies for Parallel Computation.**  
Piscataway, NJ, DIMACS, September 1993.
- P. B. Gibbons.  
**Asynchronous PRAM Algorithms.**  
Invited book chapter for *A Synthesis of Parallel Algorithms*, J. H. Reif (Ed.), Morgan-Kaufmann, 1993, pp. 957–997.

## Journal Publications

- S. Chen, P. B. Gibbons, M. Kozuch and T. C. Mowry.  
**Log-Based Architectures: Using Multicore to Help Software Behave Correctly.**  
*ACM SIGOPS Operating Systems Review*, 45:1 (2011), special issue on systems research at Intel, pp. 84–91.
- D. Spoonhower, G. E. Blelloch, R. Harper and P. B. Gibbons.  
**Space Profiling for Parallel Functional Programs.**  
*Journal of Functional Programming*, 20:5-6 (2010), special issue of selected papers from ICFP’08, pp. 417–461. (journal version of the conference paper C14 listed below under Conference Publications)
- M. Athanassoulis, A. Ailamaki, S. Chen, P. B. Gibbons and R. Stoica.  
**Flash in a DBMS: Where and How?**  
*IEEE Data Engineering Bulletin*, 33:4 (2010), special issue on data management using modern storage hardware, pp. 28–34.
- H. Yu, P. B. Gibbons, M. Kaminsky and F. Xiao.  
**SybilLimit: A Near-Optimal Social Network Defense Against Sybil Attacks.**  
*IEEE/ACM Transactions on Networking*, 18:3 (2010), pp. 885–898. (journal version of C19)
- S. Nath and P. B. Gibbons.  
**Online Maintenance of Very Large Random Samples on Flash Storage.**  
*The VLDB Journal*, 19:1 (2010), special issue of selected papers from VLDB’08, pp. 67–90. (journal version of C15)

- H. Yu and P. B. Gibbons.  
**Optimal Inter-Object Correlation when Replicating for Availability.**  
*Journal of Distributed Computing*, 21:5 (2009), special issue of selected papers from PODC'07, pp. 367–384. (journal version of C21)
- S. Chen, M. Kozuch, P. B. Gibbons, M. Ryan, T. Strigkos, T. C. Mowry, O. Ruwase, E. Vlachos, B. Falsafi and V. Ramachandran.  
**Flexible Hardware Acceleration for Instruction-Grain Lifeguards.**  
*IEEE Micro*, 29:1 (2009), special issue of Top Picks from the 2008 Computer Architecture Conferences, pp. 62–72. (journal version of C16)
- H. Yu, M. Kaminsky, P. B. Gibbons and A. Flaxman.  
**SybilGuard: Defending Against Sybil Attacks via Social Networks.**  
*IEEE/ACM Transactions on Networking*, 16:3 (2008), special issue of selected papers from SIGCOMM'06, pp. 576–589. (journal version of C26)
- S. Nath, P. B. Gibbons, S. Seshan and Z. Anderson.  
**Synopsis Diffusion for Robust Aggregation in Sensor Networks.**  
*ACM Transactions on Sensor Networks*, 4:2 (2008), article 7. (journal version of C35)
- S. Chen, A. Ailamaki, P. B. Gibbons and T. C. Mowry.  
**Improving Hash Join Performance Through Prefetching.**  
*ACM Transactions on Database Systems*, 32:3 (2007), article 17. (journal version of C37)
- M. Balazinska, A. Deshpande, M. Franklin, P. B. Gibbons, J. Gray, M. Hansen, M. Liebhold, S. Nath, A. Szalay and V. Tao.  
**Data Management in the World-Wide Sensor Web.**  
*IEEE Pervasive Computing*, 6:2 (2007), pp. 30–40.
- A. Wong, L. Wu, P. B. Gibbons and C. Faloutsos.  
**Fast Estimation of Fractal Dimension and Correlation Integral on Stream Data.**  
*Information Processing Letters*, 93:2 (2005), pp. 91–97. (journal version of the workshop paper W5 listed below under Workshop Publications)
- P. B. Gibbons and S. Tirthapura.  
**Distributed Streams Algorithms for Sliding Windows.**  
*Theory of Computing Systems*, 37 (2004), special issue of selected papers from SPAA'02, pp. 457–478. (journal version of C40)
- M. Garofalakis and P. B. Gibbons.  
**Probabilistic Wavelet Synopses.**  
*ACM Transactions on Database Systems*, 29:1 (2004), special issue of selected papers from SIGMOD'02, pp. 43–90. (journal version of C42)
- P. B. Gibbons, B. Karp, Y. Ke, S. Nath and S. Seshan.  
**IrisNet: An Architecture for a Worldwide Sensor Web.**  
*IEEE Pervasive Computing*, 2:4 (2003), special issue on sensor and actuator networks, pp. 22–33.
- G. E. Blelloch, P. Cheng and P.B. Gibbons.  
**Scalable Room Synchronizations.**  
*Theory of Computing Systems*, 36:5 (2003), special issue of selected papers from SPAA'01, pp. 397–430. (journal version of C46)
- P. B. Gibbons, Y. Matias and V. Poosala.  
**Fast Incremental Maintenance of Approximate Histograms.**  
*ACM Transactions on Database Systems (TODS)*, 27:3 (2002), pp. 261–298. (journal version of C54)

- N. Alon, P. B. Gibbons, Y. Matias and M. Szegedy.  
**Tracking Join and Self-Join Sizes in Limited Storage.**  
*Journal of Computer and System Sciences (JCSS)*, 64:3 (2002), special issue of selected papers from PODS'99, pp. 719–747. (journal version of C50)
- P. B. Gibbons, J. Bruno and S. Phillips.  
**Black-Box Correctness Tests for Basic Parallel Data Structures.**  
*Theory of Computing Systems*, 35 (2002), special issue of selected papers from SPAA'99, pp. 391–432. (journal version of C51)
- M. Adler, P. B. Gibbons and Y. Matias.  
**Scheduling Space-Sharing for Internet Advertising.**  
*Journal of Scheduling*, 5:2 (2002), pp. 103–119.
- E. Gabber, P. B. Gibbons, D. M. Kristol, Y. Matias and A. Mayer.  
**On Secure and Pseudonymous Client-Relationships with Multiple Servers.**  
*ACM Transactions on Information and System Security (TISSEC)*, 2:4 (1999), pp. 390–415. (journal version of W8)
- M. Adler, P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Modeling Parallel Bandwidth: Local vs. Global Restrictions.**  
*Algorithmica*, 24:3-4 (1999), special issue on coarse-grained parallel algorithms, pp. 381–404. (journal version of C56)
- P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Can A Shared-Memory Model Serve as a Bridging Model for Parallel Computation?**  
*Theory of Computing Systems*, 32:3 (1999), special issue of selected papers from SPAA'97, pp. 327–359. (journal version of C57)
- G. E. Blelloch, P. B. Gibbons and Y. Matias.  
**Provably Efficient Scheduling for Languages with Fine-Grained Parallelism.**  
*Journal of the ACM (JACM)*, 46:2 (1999), pp. 281–321. (journal version of C62)
- E. Gabber, P. B. Gibbons, D. M. Kristol, Y. Matias and A. Mayer.  
**Consistent yet Anonymous Web Access with LPWA.**  
*Communications of the ACM (CACM)*, 42:2 (1999), special issue on internet privacy, pp. 42–47. (journal version of C58)
- P. B. Gibbons, Y. Matias and V. Ramachandran.  
**The Queue-Read Queue-Write Asynchronous PRAM Model.**  
*Theoretical Computer Science (TCS)*, 196:1-2 (1998), special issue of selected papers from Euro-Par'96, pp. 3–29. (journal version of C59)
- P. B. Gibbons, Y. Matias and V. Ramachandran.  
**The Queue-Read Queue-Write PRAM Model: Accounting for Contention in Parallel Algorithms.**  
*SIAM Journal on Computing (SICOMP)*, 28:2 (1998), pp. 733–769. (journal version of C66)
- P. B. Gibbons and E. Korach.  
**Testing Shared Memories.**  
*SIAM Journal on Computing (SICOMP)*, 26:4 (1997), pp. 1208–1244. (journal version of C65 and C67)
- G. E. Blelloch, P. B. Gibbons, Y. Matias and M. Zagha.  
**Accounting for Memory Bank Contention and Delay in High-Bandwidth Multiprocessors.**  
*IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 8:9 (1997), pp. 943–958. (journal version of C61)

- P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Efficient Low-Contention Parallel Algorithms.**  
*Journal of Computer and System Sciences (JCSS)*, 53:3 (1996), special issue of selected papers from SPAA'94, pp. 417–442. (journal version of C64)
- C. W. Niblack, P. B. Gibbons and D. W. Capson.  
**Generating Skeletons and Centerlines from the Distance Transform.**  
*CVGIP: Graphical Models and Image Processing (CVGIP)*, 54:5 (1992), pp. 420–437. (journal version of C70 and C75)
- P. Gibbons, R. Karp, V. Ramachandran, D. Soroker and R. Tarjan.  
**Transitive Compaction in Parallel Via Branchings.**  
*Journal of Algorithms (JALG)*, 12:1 (1991), pp. 110–125.
- P. B. Gibbons, R. M. Karp, G. L. Miller and D. Soroker.  
**Subtree Isomorphism is in Random NC.**  
*Discrete Applied Mathematics (DAM)*, 29:1 (1990), pp. 35–62. (journal version of W9)
- P. B. Gibbons.  
**A Stub Generator for Multilanguage RPC in Heterogeneous Environments.**  
*IEEE Transactions on Software Engineering (TSE)*, SE-13:1 (1987), special issue on distributed systems, pp. 77–87.

## Conference Publications

Papers appearing in highly-selective, refereed international conferences. Summary: Of the papers listed below, 66 are in premier conferences, primarily SIGMOD and SPAA, but also ASPLOS, CIDR, CVPR, EuroSys, FAST, ICDE, ICFP, IPSN, ISCA, KDD, Multimedia, NSDI, Oakland, PLDI, PODC, PODS, PPOPP, SenSys, SIGCOMM, SIGMETRICS, SODA, and VLDB.

- C1. B. Chen, H. Yu, Y. Zhao and P. B. Gibbons.  
**The Cost of Fault Tolerance in Multi-Party Communication Complexity.**  
In *Proceedings of the 31st ACM Symposium on Principles of Distributed Computing (PODC)*, Madeira, Portugal, July 2012, to appear.
- C2. X. Ding, K. Wang, P. B. Gibbons and X. Zhang.  
**BWS: Balanced Work Stealing for Time-Sharing Multicores.**  
In *Proceedings of the 12th ACM European Conference on Computer Systems (EuroSys)*, Bern, Switzerland, April 2012, pp. 365–378.
- C3. G. E. Blelloch, J. T. Fineman, P. B. Gibbons and J. Shun.  
**Internally Deterministic Parallel Algorithms Can Be Fast.**  
In *Proceedings of the 17th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPOPP)*, New Orleans, LA, February 2012, pp. 181–192.
- C4. M. Athanassoulis, S. Chen, A. Ailamaki, P. B. Gibbons, R. Stoica.  
**MaSM: Efficient Online Updates in Data Warehouses.**  
In *Proceedings of the 30th ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Athens, Greece, June 2011, pp. 865–876.
- C5. G. E. Blelloch, J. T. Fineman, P. B. Gibbons and H. V. Simhadri.  
**Scheduling Irregular Parallel Computations on Hierarchical Caches.**  
In *Proceedings of the 23rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, San Jose, CA, June 2011, pp. 355–366.

- C6. S. Chen, P. B. Gibbons and S. Nath.  
**Rethinking Database Algorithms for Phase Change Memory.**  
 In *Proceedings of the 5th Biennial Conference on Innovative Data Systems Research (CIDR)*, Asilomar, CA, January 2011, pp. 21–31.
- C7. G. E. Blelloch, P. B. Gibbons and H. V. Simhadri.  
**Low Depth Cache-Oblivious Algorithms.**  
 In *Proceedings of the 22nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Santorini, Greece, June 2010, pp. 189–199.
- C8. O. Ruwase, S. Chen, P. B. Gibbons and T. C. Mowry.  
**Decoupled Lifeguards: Enabling Path Optimizations for Online Correctness Checking Tools.**  
 In *Proceedings of the ACM SIGPLAN 2010 Conference on Programming Language Design and Implementation (PLDI)*, Toronto, Canada, June 2010, pp. 25–35.
- C9. S. Chen, P. B. Gibbons and S. Nath.  
**PR-Join: A Non-Blocking Join Achieving Higher Result Rate with Statistical Guarantee.**  
 In *Proceedings of the 29th ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Indianapolis, IN, June 2010, pp. 147–158.
- C10. M. Goodstein, E. Vlachos, S. Chen, P. B. Gibbons, M. A. Kozuch and T. C. Mowry.  
**Butterfly Analysis: Adapting Dataflow Analysis to Dynamic Parallel Monitoring.**  
 In *Proceedings of the 15th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, Pittsburgh, PA, March 2010, pp. 257–270.
- C11. E. Vlachos, M. Goodstein, M. A. Kozuch, S. Chen, B. Falsafi, P. B. Gibbons and T. C. Mowry.  
**ParaLog: Enabling and Accelerating Online Parallel Monitoring of Multithreaded Applications.**  
 In *Proceedings of the 15th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, Pittsburgh, PA, March 2010, pp. 271–283.
- C12. D. Spoonhower, G. E. Blelloch, P. B. Gibbons and R. Harper.  
**Beyond Nested Parallelism: Tight Bounds on Work-Stealing Overheads for Parallel Futures.**  
 In *Proceedings of the 21st ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Calgary, Canada, August 2009, pp. 91–100.
- C13. H. Yu, C. Shi, M. Kaminsky, P. B. Gibbons and F. Xiao.  
**DSybil: Optimal Sybil-Resistance for Recommendation Systems.**  
 In *Proceedings of the 30th IEEE Symposium on Security and Privacy (Oakland)*, Oakland, CA, May 2009, pp. 283–298. Selected for the short list of best papers in Oakland’09.
- C14. D. Spoonhower, G. E. Blelloch, R. Harper and P. B. Gibbons.  
**Space Profiling for Parallel Functional Programs.**  
 In *Proceedings of the 13th ACM SIGPLAN International Conference on Functional Programming (ICFP)*, Victoria, British Columbia, Canada, September 2008, pp. 253–264. Selected for a special journal issue for best papers in ICFP’08.
- C15. S. Nath and P. B. Gibbons.  
**Online Maintenance of Very Large Random Samples on Flash Storage.**  
 In *Proceedings of the 34th International Conference on Very Large Data Bases (VLDB)*, Auckland, New Zealand, August 2008, pp. 970–983. Selected for a special journal issue for best papers in VLDB’08.
- C16. S. Chen, M. Kozuch, T. Strigkos, B. Falsafi, P. B. Gibbons, T. C. Mowry, V. Ramachandran, M. Ryan, O. Ruwase and E. Vlachos.  
**Flexible Hardware Acceleration for Instruction-Grain Program Monitoring.**  
 In *Proceedings of the 35th ACM International Symposium on Computer Architecture (ISCA)*, Beijing,

China, June 2008, pp. 377–388. Selected for a special journal issue for best papers from the 2008 computer architecture conferences.

- C17. G. E. Blelloch, P. B. Gibbons and S. H. Vardhan.  
**Combinable Memory-Block Transactions.**  
In *Proceedings of the 20th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Munich, Germany, June 2008, pp. 23–34.
- C18. O. Ruwase, P. B. Gibbons, T. C. Mowry, V. Ramachandran, S. Chen, M. Kozuch and M. Ryan.  
**Parallelizing Dynamic Information Flow Tracking.**  
In *Proceedings of the 20th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Munich, Germany, June 2008, pp. 35–45.
- C19. H. Yu, P. B. Gibbons, M. Kaminsky and F. Xiao.  
**SybilLimit: A Near-Optimal Social Network Defense Against Sybil Attacks.**  
In *Proceedings of the 29th IEEE Symposium on Security and Privacy (Oakland)*, Oakland, CA, May 2008, pp. 3–17.
- C20. G. E. Blelloch, R. A. Chowdhury, P. B. Gibbons, V. Ramachandran, S. Chen and M. Kozuch.  
**Provably Good Multicore Cache Performance for Divide-and-Conquer Algorithms.**  
In *Proceedings of the 19th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2008, pp. 501–510.
- C21. H. Yu and P. B. Gibbons.  
**Optimal Inter-Object Correlation when Replicating for Availability.**  
In *Proceedings of the 26th ACM Symposium on Principles of Distributed Computing (PODC)*, Portland, OR, August 2007, pp. 254–263. Selected for a special journal issue for best papers in PODC’07.
- C22. J. Pang, P. B. Gibbons, M. Kaminsky, S. Seshan and H. Yu.  
**Defragmenting DHT-based Distributed File Systems.**  
In *Proceedings of the 27th IEEE International Conference on Distributed Computing Systems (ICDCS)*, Toronto, Ontario, Canada, June 2007, article 14.
- C23. S. Chen, P. B. Gibbons, M. Kozuch, V. Liaskovitis, A. Ailamaki, G. E. Blelloch, B. Falsafi, L. Fix, N. Hardavellas, T. C. Mowry and C. Wilkerson.  
**Scheduling Threads for Constructive Cache Sharing on CMPs.**  
In *Proceedings of the 19th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, San Diego, CA, June 2007, pp. 105–115.
- C24. S. Nath and P. B. Gibbons.  
**Communicating via Fireflies: Geographic Routing on Duty-Cycled Sensors.**  
In *Proceedings of the 6th IEEE/ACM International Symposium on Information Processing in Sensor Networks (IPSN)*, Cambridge, MA, April 2007, pp. 440–449.
- C25. A. Manjhi, P. B. Gibbons, A. Ailamaki, C. Garrod, B. Maggs, T. C. Mowry, C. Olston, A. Tomasic and H. Yu.  
**Invalidation Clues for Database Scalability Services.**  
In *Proceedings of the 23rd IEEE International Conference on Data Engineering (ICDE)*, Istanbul, Turkey, April 2007, pp. 316–325.
- C26. H. Yu, M. Kaminsky, P. B. Gibbons and A. Flaxman.  
**SybilGuard: Defending Against Sybil Attacks via Social Networks.**  
In *Proceedings of the ACM SIGCOMM 2006 (SIGCOMM)*, Pisa, Italy, September 2006, pp. 267–278. Selected for a special journal issue for best papers in SIGCOMM’06.
- C27. H. Yu, P. B. Gibbons and S. Nath.  
**Availability of Multi-Object Operations.**  
In *Proceedings of the 3rd USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, San Jose, CA, May 2006, pp. 211–224. Co-winner of the NSDI’06 best paper award.

- C28. S. Nath, H. Yu, P. B. Gibbons and S. Seshan.  
**Subtleties in Tolerating Correlated Failures in Wide-Area Storage Systems.**  
 In *Proceedings of the 3rd USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, San Jose, CA, May 2006, pp. 225–238.
- C29. S. Nath, P. B. Gibbons and S. Seshan.  
**Adaptive Data Placement for Wide-Area Sensing Services.**  
 In *Proceedings of the 4th USENIX Conference on File and Storage Technologies (FAST)*, San Francisco, CA, December 2005, pp. 45–58.
- C30. J. Campbell, P. B. Gibbons, S. Nath, P. Pillai, S. Seshan and R. Sukthankar.  
**IrisNet: An Internet-Scale Architecture for Multimedia Sensors.**  
 In *Proceedings of the 13th International Conference on Multimedia (MM)*, Singapore, November 2005, pp. 81–88.
- C31. S. Chen, A. Ailamaki, P. B. Gibbons and T. C. Mowry.  
**Inspector Joins.**  
 In *Proceedings of the 31st International Conference on Very Large Data Bases (VLDB)*, Trondheim, Norway, August-September 2005, pp. 817–828.
- C32. S. Chen, P. B. Gibbons and S. Nath.  
**Database-Centric Programming of Wide-Area Sensor Systems.**  
 In *Proceedings of the First IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS)*, Marina del Rey, CA, June-July 2005, pp. 89–108.
- C33. A. Manjhi, S. Nath and P. B. Gibbons.  
**Tributaries and Deltas: Efficient and Robust Aggregation in Sensor Network Streams.**  
 In *Proceedings of the 24th ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Baltimore, MD, June 2005, pp. 287–298.
- C34. S. Venkataraman, D. Song, P. B. Gibbons and A. Blum.  
**New Streaming Algorithms for Fast Detection of Superspreaders.**  
 In *Proceedings of the 12th ISOC Network and Distributed System Security Symposium (NDSS)*, San Diego, CA, February 2005.
- C35. S. Nath, P. B. Gibbons, S. Seshan and Z. Anderson.  
**Synopsis Diffusion for Robust Aggregation in Sensor Networks.**  
 In *Proceedings of the 2nd ACM International Conference on Embedded Networked Sensor Systems (SenSys)*, Baltimore, MD, November 2004, pp. 250–262.
- C36. G. E. Blelloch and P. B. Gibbons  
**Effectively Sharing a Cache Among Threads.**  
 In *Proceedings of the 16th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Barcelona, Spain, June 2004, pp. 235–244.
- C37. S. Chen, A. Ailamaki, P. B. Gibbons and T. C. Mowry.  
**Improving Hash Join Performance Through Prefetching.**  
 In *Proceedings of the 20th IEEE International Conference on Data Engineering (ICDE)*, Boston, MA, March-April 2004, pp. 116–127. Co-winner of the ICDE’04 best paper award.
- C38. A. Deshpande, S. Nath, P. B. Gibbons and S. Seshan.  
**Cache-and-Query for Wide Area Sensor Databases.**  
 In *Proceedings of the 2003 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, San Diego, CA, June 2003, pp. 503–514.
- C39. S. Papadimitriou, H. Kitawaga, P. B. Gibbons and C. Faloutsos.  
**LOCI: Fast Outlier Detection Using the Local Correlation Integral.**  
 In *Proceedings of the 19th IEEE International Conference on Data Engineering (ICDE)*, Bangalore, India, March 2003, pp. 315–326.

- C40. P. B. Gibbons and S. Tirthapura.  
**Distributed Streams Algorithms for Sliding Windows.**  
 In *Proceedings of the 14th ACM Symposium on Parallel in Algorithms and Architectures (SPAA)*, Winnipeg, Canada, August 2002, pp. 63–72. Selected for a special journal issue for best papers in SPAA’02.
- C41. C. R. Palmer, P. B. Gibbons and C. Faloutsos.  
**ANF: A Fast and Scalable Tool for Data Mining in Massive Graphs.**  
 In *Proceedings of the 8th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, Edmonton, Alberta, Canada, July 2002, pp. 81–90.
- C42. M. Garofalakis and P. B. Gibbons.  
**Wavelet Synopses with Error Guarantees.**  
 In *Proceedings of the 2002 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Madison, WI, June 2002, pp. 476–487. Selected for a special journal issue for best papers in SIGMOD’02.
- C43. S. Chen, P. B. Gibbons, T. C. Mowry and G. Valentin.  
**Fractal Prefetching B<sup>+</sup>-Trees: Optimizing Both Cache and Disk Performance.**  
 In *Proceedings of the 2002 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Madison, WI, June 2002, pp. 157–168.
- C44. P. B. Gibbons.  
**Distinct Sampling for Highly-Accurate Answers to Distinct Values Queries and Event Reports.**  
 In *Proceedings of the 27th International Conference on Very Large Data Bases (VLDB)*, Rome, Italy, September 2001, pp. 541–550.
- C45. P. B. Gibbons and S. Tirthapura.  
**Estimating Simple Functions on the Union of Data Streams.**  
 In *Proceedings of the 13th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Crete Island, Greece, July 2001, pp. 281–290.
- C46. G. E. Blelloch and P. Cheng and P. B. Gibbons.  
**Room Synchronizations.**  
 In *Proceedings of the 13th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Crete Island, Greece, July 2001, pp. 122–133. Selected for a special journal issue for best papers in SPAA’01.
- C47. S. Chen, P. B. Gibbons and T. C. Mowry.  
**Improving Index Performance through Prefetching.**  
 In *Proceedings of the 2001 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Santa Barbara, CA, May 2001, pp. 235–246. Selected runner-up best paper in SIGMOD’01.
- C48. S. Acharya, P. B. Gibbons and V. Poosala.  
**Congressional Samples for Approximate Answering of Group-By Queries.**  
 In *Proceedings of the 2000 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Dallas, TX, May 2000, pp. 487–498.
- C49. S. Acharya, P. B. Gibbons, V. Poosala and S. Ramaswamy.  
**Join Synopses for Approximate Query Answering.**  
 In *Proceedings of the 1999 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Philadelphia, PA, June 1999, pp. 275–286.
- C50. N. Alon, P. B. Gibbons, Y. Matias and M. Szegedy.  
**Tracking Join and Self-Join Sizes in Limited Storage.**  
 In *Proceedings of the 18th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS)*, Philadelphia, PA, June 1999, pp. 10–20. Selected for a special journal issue for best papers in PODS’99.

- C51. P. B. Gibbons, J. Bruno and S. Phillips.  
**Post-Mortem Black-Box Correctness Tests for Basic Parallel Data Structures.**  
 In *Proceedings of the 11th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Saint Malo, France, June 1999, pp. 44–53. Selected for a special journal issue for best papers in SPAA’99.
- C52. R. Barve, E. Shriver, P. B. Gibbons, B. Hillyer, Y. Matias and J. S. Vitter.  
**Modeling and Optimizing I/O Throughput of Multiple Disks on a Bus.**  
 In *Proceedings of the ACM SIGMETRICS Conference on the Measurement and Modeling of Computer Systems (SIGMETRICS)*, Atlanta, GA, May 1999, pp. 83–92.
- C53. P. B. Gibbons and Y. Matias.  
**New Sampling-Based Summary Statistics for Improving Approximate Query Answers.**  
 In *Proceedings of 1998 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Seattle, WA, June 1998, pp. 331–342.
- C54. P. B. Gibbons, Y. Matias and V. Poosala.  
**Fast Incremental Maintenance of Approximate Histograms.**  
 In *Proceedings of the 23rd International Conference on Very Large Data Bases (VLDB)*, Athens, Greece, August 1997, pp. 466–475.
- C55. G. E. Blelloch, P. B. Gibbons, Y. Matias and G. J. Narlikar.  
**Space-Efficient Scheduling of Parallelism with Synchronization Variables.**  
 In *Proceedings of the 9th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Newport, RI, June 1997, pp. 12–23.
- C56. M. Adler, P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Modeling Parallel Bandwidth: Local vs. Global Restrictions.**  
 In *Proceedings of the 9th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Newport, RI, June 1997, pp. 94–105.
- C57. P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Can A Shared-Memory Model Serve as a Bridging Model for Parallel Computation?**  
 In *Proceedings of the 9th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Newport, RI, June 1997, pp. 72–83. Selected for a special journal issue for best papers in SPAA’97.
- C58. E. Gabber, P. B. Gibbons, Y. Matias and A. Mayer.  
**How to Make Personalized Web Browsing Simple, Secure, and Anonymous.**  
 In *Proceedings of Financial Cryptography (FC)*, Anguilla, February 1997, pp. 17–31, Lecture Notes in Computer Science, Vol. 1318, Springer, Berlin.
- C59. P. B. Gibbons, Y. Matias and V. Ramachandran.  
**The Queue-Read Queue-Write Asynchronous PRAM Model.**  
 In *Proceedings of the 2nd International Euro-Par Conference (Euro-Par)*, Lyon, France, August 1996, Vol. II, pp. 279–292, Lecture Notes in Computer Science, Vol. 1124, Springer, Berlin. Selected for a special journal issue for best papers in EUROPAR’96.
- C60. S. Ganguly, P. B. Gibbons, Y. Matias and A. Silberschatz.  
**Bifocal Sampling for Skew-Resistant Join Size Estimation.**  
 In *Proceedings of the 1996 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Montreal, Canada, June 1996, pp. 271–281.
- C61. G. E. Blelloch, P. B. Gibbons, Y. Matias and M. Zagha.  
**Accounting for Memory Bank Contention and Delay in High-Bandwidth Multiprocessors.**  
 In *Proceedings of the 7th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Santa Barbara, CA, July 1995, pp. 84–94.
- C62. G. E. Blelloch, P. B. Gibbons and Y. Matias.  
**Provably Efficient Scheduling for Languages with Fine-Grained Parallelism.**

In *Proceedings of the 7th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Santa Barbara, CA, July 1995, pp. 1–12. Selected for a special journal issue for best papers in SPAA'95 (we declined in order to publish in JACM).

- C63. O. Berkman, P. B. Gibbons and Y. Matias.  
**On the Power of Randomization for the Common PRAM.**  
In *Proceedings of the 3rd Israel Symposium on Theory of Computing and Systems (ISTCS)*, Tel Aviv, Israel, January 1995, pp. 229–240.
- C64. P. B. Gibbons, Y. Matias and V. Ramachandran.  
**Efficient Low-Contention Parallel Algorithms.**  
In *Proceedings of the 6th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Cape May, NJ, June 1994, pp. 236–247. Selected for a special journal issue for best papers in SPAA'94.
- C65. P. B. Gibbons and E. Korach.  
**On Testing Cache-Coherent Shared Memories.**  
In *Proceedings of the 6th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Cape May, NJ, June 1994, pp. 177–188.
- C66. P. B. Gibbons, Y. Matias and V. Ramachandran.  
**The QRQW PRAM Model: Accounting for Contention in Parallel Algorithms.**  
In *Proceedings of the 5th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Arlington, VA, January 1994, pp. 638–648.
- C67. P. B. Gibbons and E. Korach.  
**The Complexity of Sequential Consistency.**  
In *Proceedings of the 4th IEEE Symposium on Parallel and Distributed Processing (SPDP)*, Arlington, TX, December 1992, pp. 317–325.
- C68. P. B. Gibbons and W. Niblack.  
**A Width-Independent Parallel Thinning Algorithm.**  
In *Proceedings of the 11th International Conference on Pattern Recognition (ICPR)*, The Hague, Netherlands, August-September 1992, Vol. III, pp. 708–711.
- C69. P. B. Gibbons and M. Merritt.  
**Specifying Nonblocking Shared Memories.**  
In *Proceedings of the 4th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, San Diego, CA, June-July 1992, pp. 306–315.
- C70. W. Niblack, P. B. Gibbons and D. Capson.  
**Generating Connected Skeletons for Exact and Approximate Reconstruction.**  
In *Proceedings of International Conference on Computer Vision and Pattern Recognition (CVPR)*, Champaign, IL, June 1992, pp. 826–828.
- C71. K. Gharachorloo and P. B. Gibbons.  
**Detecting Violations of Sequential Consistency.**  
In *Proceedings of the 3rd ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Hilton Head, SC, July 1991, pp. 316–326.
- C72. P. B. Gibbons, M. Merritt and K. Gharachorloo.  
**Proving Sequential Consistency of High-Performance Shared Memories.**  
In *Proceedings of the 3rd ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Hilton Head, SC, July 1991, pp. 292–303.
- C73. Y. Birk, P. B. Gibbons, J. L. C. Sanz and D. Soroker.  
**A Simple Mechanism for Efficient Barrier Synchronization in MIMD Machines.**  
In *Proceedings of the 19th International Conference on Parallel Processing (ICPP)*, St. Charles, IL, August 1990, Vol. II, pp. 195–198.

- C74. P. B. Gibbons.  
**Cache Support for the Asynchronous PRAM.**  
 In *Proceedings of the 19th International Conference on Parallel Processing (ICPP)*, St. Charles, IL, August 1990, Vol. I, pp. 322–325.
- C75. C. W. Niblack, D. W. Capson and P. B. Gibbons.  
**Generating Skeletons and Centerlines from the Medial Axis Transform.**  
 In *Proceedings of the 10th International Conference on Pattern Recognition (ICPR)*, Atlantic City, NJ, June 1990, pp. 881–885.
- C76. K. Gharachorloo, D. Lenoski, J. Laudon, P. Gibbons, A. Gupta and J. Hennessy.  
**Memory Consistency and Event Ordering in Scalable Shared-Memory Multiprocessors.**  
 In *Proceedings of the 17th International Symposium on Computer Architecture (ISCA)*, Seattle, WA, May 1990, pp. 15–26.
- C77. P. B. Gibbons.  
**A More Practical PRAM Model.**  
 In *Proceedings of the 1st ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Santa Fe, NM, June 1989, pp. 158–168.
- C78. P. B. Gibbons and S. S. Muchnick.  
**Efficient Instruction Scheduling for a Pipelined Architecture.**  
 In *Proceedings of 1986 ACM Symposium on Compiler Construction* (now known as **PLDI**), Palo Alto, CA, June 1986, pp. 11–16. Selected one of the 50 most influential papers in the first 20 years of PLDI.

## Workshop Publications

Selected refereed workshop publications:

- W1. S. Chen, B. Falsafi, P. B. Gibbons, M. Kozuch, T. C. Mowry, R. Teodorescu, A. Ailamaki, L. Fix, G. R. Ganger, B. Lin and S. W. Schlosser.  
**Log-Based Architectures for General-Purpose Monitoring of Deployed Code.**  
 In *Proceedings of the ACM Workshop on Architectural and System Support for Improving Software Dependability (ASID)*, San Jose, CA, October 2006. Held in conjunction with ACM ASPLOS'06.
- W2. D. Sundarraj, P. B. Gibbons and P. Pillai.  
**Ensuring Spatio-Temporal Consistency in Distributed Networks of Smart Cameras.**  
 In *Proceedings of the ACM Workshop on Distributed Smart Cameras (DSC)*, Boulder, CO, October 2006. Held in conjunction with ACM SenSys'06.
- W3. P. Yalagandula, S. Nath, H. Yu, P. B. Gibbons and S. Seshan.  
**Beyond Availability: Towards a Deeper Understanding of Machine Failure Characteristics in Large Distributed Systems.**  
 In *Proceedings of the First Usenix Workshop on Real, Large Distributed Systems (WORLDS)*, San Francisco, CA, December 2004.
- W4. S. Nath, Y. Ke, P. B. Gibbons, B. Karp and S. Seshan.  
**A Distributed Filtering Architecture for Multimedia Sensors.**  
 In *Proceedings of the First IEEE Workshop on Broadband Advanced Sensor Networks (BaseNets)*, San Jose, CA, October 2004. Winner, best paper award.
- W5. A. Wong, L. Wu and P. B. Gibbons.  
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- W6. C. R. Palmer, G. Siganos, M. Faloutsos, C. Faloutsos and P. B. Gibbons.  
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- W7. R. Barve, P. B. Gibbons, B. K. Hillyer, Y. Matias, E. Shriver and J. S. Vitter.  
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- W8. D. Bleichenbacher, E. Gabber, P. B. Gibbons, Y. Matias and A. Mayer.  
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- W9. P. B. Gibbons, R. M. Karp, G. L. Miller and D. Soroker.  
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## Major Demo Presentations

System demos selected for presentation at highly-selective conferences:

- B. Aksak, P. S. Bhat, J. Campbell, M. DeRosa, S. Funiak, P. B. Gibbons, S. C. Goldstein, C. Guestrin, A. Gupta, C. Helfrich, J. Hoburg, B. Kirby, J. Kuffner, P. Lee, T. C. Mowry, P. S. Pillai, R. Ravichandran, B. D. Rister, S. Seshan, M. Sitti and H. Yu.  
**Demo Abstract: Claytronics - Highly Scalable Communications, Sensing, and Actuation Networks.**  
 Selected demo presentation in the *3rd ACM International Conference on Embedded Networked Sensor Systems (SenSys)*, San Diego, CA, November 2005, pp. 299.
- S. Nath, Y. Ke, A. Deshpande, P. B. Gibbons, B. Karp and S. Seshan.  
**IrisNet: An Architecture for Internet-scale Sensing Services.**  
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- A. Deshpande, S. Nath, P. B. Gibbons and S. Seshan.  
**IrisNet: Internet-Scale Resource-Intensive Sensor Services.**  
 Selected demo presentation and abstract in *Proceedings of the 2003 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, San Diego, CA, June 2003, pp. 667.
- S. Acharya, P. B. Gibbons and V. Poosala.  
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 Selected demo presentation and abstract in *Proceedings of the 25th International Conference on Very Large Databases (VLDB)*, Edinburgh, Scotland, UK, September 1999, pp. 754–757.
- S. Acharya, P. B. Gibbons, V. Poosala and S. Ramaswamy.  
**The Aqua Approximate Query Answering System.**  
 Selected demo presentation and abstract in *Proceedings of the 1999 ACM SIGMOD International Conference on Management of Data (SIGMOD)*, Philadelphia, PA, June 1999, pp. 574–576.

## Other Publications

Invited position papers and encyclopedia entries, refereed conference summary papers and tutorials, refereed SIG newsletter articles, Ph.D thesis, and selected technical reports not published elsewhere:

- J. Shun, G. E. Blleloch, J. T. Fineman, P. B. Gibbons, A. Kyrola, H. V. Simhadri and K. Tangwongsan.  
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Brief announcement in *Proceedings of the 24th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Pittsburgh, PA, June 2012, to appear.
- H. Yu, P. B. Gibbons and C. Shi.  
**Brief Announcement: Sustaining Collaboration in Multicast despite Rational Collusion.**  
Brief announcement in *Proceedings of the 30th ACM Symposium on Principles of Distributed Computing (PODC'11)*, San Jose, CA, June 2011, pp. 337–338.
- S. Chen, A. Ailamaki, M. Athanassoulis, P. B. Gibbons, R. Johnson, I. Pandis and R. Stoica.  
**TPC-E vs. TPC-C: Characterizing the New TPC-E Benchmark via an I/O Comparison Study.**  
*Sigmod Record*, 39:3 (2010), pp. 5–10.
- P. B. Gibbons  
**Data Storage and Indexing in Sensor Networks.**  
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- P. B. Gibbons.  
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- P. B. Gibbons.  
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- P. B. Gibbons.  
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- P. B. Gibbons.  
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## Patents

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5. S. Acharya, P. B. Gibbons and V. Poosala.  
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7. S. Acharya, P. B. Gibbons and V. Poosala.  
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