Stanford



Jennifer Widom

Frederick Emmons Terman Dean of the School of Engineering, Fletcher Jones Professor of Computer Science and Professor of Electrical Engineering

CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Jennifer Widom is the Frederick Emmons Terman Dean of the School of Engineering and the Fletcher Jones Professor in Computer Science and Electrical Engineering at Stanford University. She served as Computer Science Department Chair from 2009-2014 and School of Engineering Senior Associate Dean from 2014-2016. Jennifer received her Bachelor's degree from the Indiana University Jacobs School of Music in 1982 and her Computer Science Ph.D. from Cornell University in 1987. She was a Research Staff Member at the IBM Almaden Research Center before joining the Stanford faculty in 1993. Her research interests span many aspects of nontraditional data management. She is an ACM Fellow and a member of the National Academy of Engineering and the American Academy of Arts & Sciences; she received a Guggenheim Fellowship in 2000, the ACM SIGMOD Edgar F. Codd Innovations Award in 2007, the ACM-W Athena Lecturer Award in 2015, and the EPFL-WISH Foundation Erna Hamburger Prize in 2018.

ACADEMIC APPOINTMENTS

- Professor, Computer Science
- Professor, Electrical Engineering

ADMINISTRATIVE APPOINTMENTS

- Dean, School of Engineering, (2017- present)
- Senior Associate Dean for Faculty and Academic Affairs, School of Engineering, (2014-2016)
- Department Chair, Computer Science, (2009-2014)

HONORS AND AWARDS

- Member, National Academy of Engineering (2005 - present)
- Member, American Academy of Arts & Sciences (2009 - present)
- Fellow, ACM (2005 - present)
- Edgar F. Codd Innovations Award, ACM SIGMOD (2007)
- Erna Hamburger Prize, EPFL-WISH Foundation (2018)
- Athena Lecturer Award, ACM-W (2015)

- Fellow, Guggenheim Foundation (2000-01)
- Career Achievement Award, Indiana University School of Informatics and Computing (2015)
- Education Award, IEEE Technical Committee of Data Engineering (2018)

PROFESSIONAL EDUCATION

- PhD, Cornell University , Computer Science (1987)
- MS, Cornell University , Computer Science (1985)
- MS, Indiana University , Computer Science (1983)
- BS, Indiana University Jacobs School of Music , Music (1982)

LINKS

- Google Scholar page: https://scholar.google.com/citations?user=zdKmnYwAAAAJ&hl=en
- Faculty home page: https://cs.stanford.edu/people/widom/
- Dean home page: https://engineering.stanford.edu/about/dean

Teaching

COURSES

2026-27

- Datathletics: Diving into Data Analytics and Stanford Sports: CS 47N (Spr)

2025-26

- Datathletics: Diving into Data Analytics and Stanford Sports: CS 47N (Spr)

2024-25

- Datathletics: Diving into Data Analytics and Stanford Sports: CS 47N (Spr)

STANFORD ADVISEES

Master's Program Advisor

Wilfredo Aybar, Liam Custer, Malvyn Lai, Clara Wang, Sophia Zhang

Publications

PUBLICATIONS

- **Understanding Workers, Developing Effective Tasks, and Enhancing Marketplace Dynamics: A Study of a Large Crowdsourcing Marketplace** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Jain, A., Das Sarma, A., Parameswaran, A., Widom, J.
  2017; 10 (7): 829-840
- **Towards Globally Optimal Crowdsourcing Quality Management: The Uniform Worker Setting.** *Proceedings. ACM-Sigmod International Conference on Management of Data*
  Das Sarma, A., Parameswaran, A., Widom, J.
  2016; 2016: 47-62
- **STREAM: The Stanford Data Stream Management System** *DATA STREAM MANAGEMENT: PROCESSING HIGH-SPEED DATA STREAMS*
  Arasu, A., Babcock, B., Babu, S., Cieslewicz, J., Datar, M., Ito, K., Motwani, R., Srivastava, U., Widom, J.
  edited by Garofalakis, M., Gehrke, J., Rastogi, R.
  2016: 317–36
- **Surpassing Humans and Computers with JellyBean: Crowd-Vision-Hybrid Counting Algorithms.** *Proceedings of the ... AAAI Conference on Human Computation and Crowdsourcing*

Sarma, A. D., Jain, A., Nandi, A., Parameswaran, A., Widom, J.
2015; 2015: 178-187

- **Graft: A Debugging Tool For Apache Giraph**
  Salihoglu, S., Shin, J., Khanna, V., Ba Quan Truong, Widom, J., ACM SIGMOD
  ASSOC COMPUTING MACHINERY.2015: 1403-1408

- **Three Favorite Results**
  Widom, J., ACM SIGMOD
  ASSOC COMPUTING MACHINERY.2015: 659

- **The Beckman Report on Database Research** *SIGMOD RECORD*
  Abadi, D., Agrawal, R., Ailamaki, A., Balazinska, M., Bernstein, P. A., Carey, M. J., Chaudhuri, S., Dean, J., Doan, A., Franklin, M. J., Gehrke, J., Haas, L. M., Halevy, et al
  2014; 43 (3): 61-70

- **Optimal Crowd-Powered Rating and Filtering Algorithms** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Parameswaran, A., Boyd, S., Garcia-Molina, H., Gupta, A., Polyzotis, N., Widom, J.
  2014; 7 (9): 685-696

- **Optimizing Graph Algorithms on Pregel-like Systems** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Salihoglu, S., Widom, J.
  2014; 7 (7): 577-588

- **Optimizing Graph Algorithms on Pregel-like Systems.**
  Salihoglu, S., Widom., J.
  2014

- **CrowdFill: Collecting Structured Data from the Crowd**
  Park, H., Widom, J., ACM SIGMOD
  ASSOC COMPUTING MACHINERY.2014: 577-588

- **DataSift: A Crowd-Powered Search Toolkit**
  Parameswaran, A., Teh, M., Garcia-Molina, H., Widom, J., ACM SIGMOD
  ASSOC COMPUTING MACHINERY.2014: 885-888

- **CrowdFill: A System for Collecting Structured Data from the Crowd**
  Park, H., Widom, J., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2014: 87-90

- **Query Optimization over Crowdsourced Data** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Park, H., Widom, J.
  2013; 6 (10): 781-792

- **GPS: A Graph Processing System.**
  Salihoglu, S., Widom., J.
  2013

- **Logical Provenance in Data-Oriented Workflows** *29th IEEE International Conference on Data Engineering (ICDE)*
  Ikeda, R., Sarma, A. D., Widom, J.
  IEEE.2013: 877–888

- **Logical Provenance in Data-Oriented Workflows.**
  Ikeda, R., Das Sarma, A., Widom, J.
  2013

- **DataSift: An Expressive and Accurate Crowd-Powered Search Toolkit.**
  Parameswaran, A., Teh, M., H., Garcia-Molina, H., Widom, J.
  2013

- **Optimal Crowd-Powered Rating and Filtering Algorithms.** *Technical Report*
  Parameswaran, A., Boyd, S., Garcia-Molina, H., Gupta, A., Polyzotis, N., Widom, J.
  2013
- **CrowdFill: Collecting Structured Data from the Crowd.** *Technical Report*
  Park, H., Widom, J.
  2013
- **CrowdFill: A System for Collecting Structured Data from the Crowd.** *Technical Report and Demonstration Proposal*
  Park, H., Widom, J.
  2013
- **3X: A Data Management System for Computational Experiments.** *Technical Report and Demonstration Proposal*
  Shin, J., Paepcke, A., Widom, J.
  2013
- **Query Optimization over Crowdsourced Data.**
  Park, H., Widom., J.
  2013
- **An Overview of the Deco System: Data Model and Query Language; Query Processing and Optimization** *SIGMOD RECORD*
  Park, H., Pang, R., Parameswaran, A., Garcia-Molina, H., Polyzotis, N., Widom, J.
  2012; 41 (4): 22-27
- **Deco: A System for Declarative Crowdsourcing** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Park, H., Pang, R., Parameswaran, A., Garcia-Molina, H., Polyzotis, N., Widom, J.
  2012; 5 (12): 1990-1993
- **Provenance-Based Debugging and Drill-Down in Data-Oriented Workflows** *28th IEEE International Conference on Data Engineering (ICDE)*
  Ikeda, R., Cho, J., Fang, C., Salihoglu, S., Torikai, S., Widom, J.
  IEEE.2012: 1249–1252
- **Deco: A System for Declarative Crowdsourcing.**
  Park, H., Pang, R., Parameswaran, A., Garcia-Molina, H., Polyzotis, N., Widom, J.
  2012
- **Query Processing over Crowdsourced Data.** *Technical Report*
  Park, H., Parameswaran, A., Widom, J.
  2012
- **Deco: Declarative Crowdsourcing.**
  Parameswaran, A., Park, H., Garcia-Molina, H., Polyzotis, N., Widom, J.
  2012
- **CrowdScreen: Algorithms for Filtering Data with Humans.**
  Parameswaran, A., Garcia-Molina, H., Park, H., Polyzotis, N., Ramesh, A., Widom, J.
  2012
- **Making Aggregation Work in Uncertain and Probabilistic Databases** *IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING*
  Murthy, R., Ikeda, R., Widom, J.
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- **RAMP: A System for Capturing and Tracing Provenance in MapReduce Workflows** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Park, H., Ikeda, R., Widom, J.
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- **Human-Assisted Graph Search: It's Okay to Ask Questions** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Parameswaran, A., Das Sarma, A., Garcia-Molina, H., Polyzotis, N., Widom, J.
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- **RAMP: A System for Capturing and Tracing Provenance in MapReduce Workflows**
  Park, H., Ikeda, R., Widom, J.
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- **Provenance-Based Refresh in Data-Oriented Workflows.**
  Ikeda, R., Salihoglu, S., Widom, J.
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- **Provenance for Generalized Map and Reduce Workflows.**
  Ikeda, R., Park, H., Widom, J.
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- **Human-Assisted Graph Search: It's Okay to Ask Questions.**
  Parameswaran, A., Das Sarma, A., Garcia-Molina, H., Polyzotis, N., Widom, J.
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- **Foundations of Uncertain-Data Integration** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Agrawal, P., Das Sarma, A., Ullman, J., Widom, J.
  2010; 3 (1): 1080-1090
- **LIVE: A Lineage-Supported Versioned DBMS** *22nd International Conference on Scientific and Statistical Database Management*
  Das Sarma, A., Theobald, M., Widom, J.
  SPRINGER-VERLAG BERLIN.2010: 416–433
- **Panda: A System for Provenance and Data.** *IEEE Data Engineering Bulletin, Special Issue on Data Provenance*
  Ikeda, R., Widom., J.
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- **Synthesizing View Definitions from Data.**
  Sarma, A., Das, Parameswaran, A., Garcia-Molina, H., Widom, J.
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- **Panda: A System for Provenance and Data.**
  Ikeda, R., Widom, J.
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- **Foundations of Uncertain-Data Integration.**
  Agrawal, P., Sarma, A., Das, Ullman, J., D., Widom, J.
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- **Generalized Uncertain Databases: First Steps.**
  Agrawal, P., Widom, J.
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- **Representing uncertain data: models, properties, and algorithms** *VLDB JOURNAL*
  Das Sarma, A., Benjelloun, O., Halevy, A., Nabar, S., Widom, J.
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- **Swoosh: a generic approach to entity resolution** *VLDB JOURNAL*
  Benjelloun, O., Garcia-Molina, H., Menestrina, D., Su, Q., Whang, S. E., Widom, J.
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- **Trio-ER: The Trio System as a Workbench for Entity-Resolution.** *Technical Report*
  Agrawal, P., Ikeda, R., Park, H., Widom., J.
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- **Outerjoins in Uncertain Databases.**
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- **Schema Design for Uncertain Databases.**
  Sarma, A., Das, Ullman, J., D., Widom, J.
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- **Confidence-Aware Join Algorithms** *IEEE 25th International Conference on Data Engineering*
  Agrawal, P., Widom, J.
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- **Trio-ER: The Trio System as a Workbench for Entity-Resolution.** *Technical Report*
  Agrawal, P., Ikeda, R., Park, H., Widom., J.
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- **Outerjoins in Uncertain Databases.**
  Ikeda, R., Widom, J.
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- **Schema Design for Uncertain Databases.**
  Sarma, A., Das, Ullman, J., D., Widom, J.
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- **Confidence-Aware Join Algorithms** *IEEE 25th International Conference on Data Engineering*
  Agrawal, P., Widom, J.
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- **Towards a Streaming SQL Standard** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Jain, N., Mishra, S., Srinivasan, A., Gehrke, J., Widom, J., Widom, J., Balakrishnan, H., Cetintemel, U., Cherniack, M., Tibbetts, R., Zdonik, S.
  2008; 1 (2): 1379-1390
- **Databases with uncertainty and lineage** *32nd International Conference on Very Large Data Bases*
  Benjelloun, O., Sarma, A. D., Hallevy, A., Theobald, M., Widom, J.
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- **Exploiting lineage for confidence computation in uncertain and probabilistic databases** *24th IEEE International Conference on Data Engineering/ 1st International Workshop on Secure Semantic Web*
  Das Sarma, A., Theobald, M., Widom, J.
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- **Towards Special-Purpose Indexes and Statistics for Uncertain Data.**
  Sarma, A., Das, Agrawal, P., Nabar, S., Widom, J.
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- **Towards a Streaming SQL Standard.**
  Jain, N., Mishra, S., Srinivasan, A., Gehrke, J., Widom, J., Balakrishnan, H.
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  Garcia-Molina, H., Ullman, J., D., Widom, J.
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- **A First Course in Database Systems.**
  Ullman, J., D., Widom, J.
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- **Optimization of Continuous Queries with Shared Expensive Filters.**
  Munagala, K., Srivastava, U., Widom, J.
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- **Trio-One: Layering Uncertainty and Lineage on a Conventional DBMS.**
  Mutsuzaki, M., Theobald, M., de Keijzer, A., Widom, J., Agrawal, P., Benjelloun, O.
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- **The CQL continuous query language: semantic foundations and query execution** *VLDB JOURNAL*
  Arasu, A., Babu, S., Widom, J.
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- **Declarative support for sensor data cleaning** *4th International Conference on Pervasive Computing*
  Jeffery, S. R., Alonso, G., Franklin, M. J., Hong, W., Widom, J.
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- **A Pipelined Framework for Online Cleaning of Sensor Data Streams**
  Jeffery, S., Alonso, G., Franklin, M., J., Hong, W., Widom., J.
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- **Trio: A System for Data, Uncertainty, and Lineage.**
  Agrawal, P., Benjelloun, O., Sarma, A., Das, Hayworth, C., Nabar, S., Sugihara, T., Widom, J.
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- **Query Optimization over Web Services.**
  Srivastava, U., Widom, J., Munagala, K., Motwani, R.
  2006
- **Estimating Data Stream Quality for Object-Detection Applications.**
  Sarma, A., Das, Jeffery, S., R., Franklin, M., J., Widom, J.
  2006
- **A Pipelined Framework for Online Cleaning of Sensor Data Streams (short paper).**
  Jeffery, S., R., Alonso, G., Franklin, M., J., Hong, W., Widom, J.
  2006
- **Generic Entity Resolution in the SERF Project.** *IEEE Data Engineering Bulletin, Special Issue on Data Quality*
  Widom, J.
  2006; 2 (29): 13-20
- **An Introduction to ULDBs and the Trio System.** *IEEE Data Engineering Bulletin, Special Issue on Probabilistic Databases*
  Benjelloun, O., Sarma, A., Das, Hayworth, C., Widom, J.
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- **Working Models for Uncertain Data.**
  Sarma, A., Das, Benjelloun, O., Halevy, A., Widom, J.
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- **ULDBs: Databases with Uncertainty and Lineage.**
  Benjelloun, O., Das Sarma, A., Halevy, A., Widom, J.
  2006
- **The Lowell database - Research self assessment** *COMMUNICATIONS OF THE ACM*
  Abiteboul, S., Agrawal, R., Bernstein, P., Carey, M., Ceri, S., Croft, B., DeWitt, D., Franklin, M., Molina, H. G., Gawlick, D., Gray, J., Haas, L., Halevy, et al
  2005; 48 (5): 111-118
- **Adaptive caching for continuous queries** *21st International Conference on Data Engineering (ICDE 2005)*
  Babu, S., Munagala, K., Widom, J., Motwani, R.
  IEEE COMPUTER SOC.2005: 118–129
- **Trio: A System for Integrated Management of Data, Accuracy, and Lineage.**
  Widom, J.
  2005
- **Operator Placement for In-Network Stream Query Processing.**
  Srivastava, U., Munagala, K., Widom, J.
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- **Content-Based Routing: Different Plans for Different Data.**
  Bizarro, P., Babu, S., DeWitt, D., Widom, J.
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- **Representing Uncertain Data: Uniqueness, Equivalence, Minimization, and Approximation** *Technical Report*
  Das Sarma, A., Nabar, S., U., Widom, J.
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- **Efficient Monitoring and Querying of Distributed, Dynamic Data via Approximate Replication.** *IEEE Data Engineering Bulletin, Special Issue on In-Network Query Processing*
  Olston, C., Widom, J.
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- **Indexing relational database content offline for efficient keyword-based search** *9th International Database Engineering and Application Symposium (IDEAS 2005)*
  Su, Q., Widom, J.
  IEEE COMPUTER SOC.2005: 297–306
- **The pipelined set cover problem** *10th International Conference on Database Theory (ICDT 2005)*
  Munagala, K., Babu, S., Motwani, R., Widom, J.
  SPRINGER-VERLAG BERLIN.2005: 83–98
- **Exploiting k-constraints to reduce memory overhead in continuous queries over data streams** *ACM TRANSACTIONS ON DATABASE SYSTEMS*
  Babu, S., Srivastava, U., Widom, J.
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- **A denotational semantics for continuous queries over streams and relations** *SIGMOD RECORD*
  Arasu, A., Widom, J.
  2004; 33 (3): 6-11
- **Characterizing memory requirements for queries over continuous data streams** *21st ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS)*
  Arasu, A., Babcock, B., Babu, S., McAlister, J., Widom, J.
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- **CQL: A language for continuous queries over streams and relations** *9th International Workshop on Data Bases and Programming Languages*
  Arasu, A., Babu, S., Widom, J.
  SPRINGER-VERLAG BERLIN.2004: 1–19
- **Mining the Space of Graph Properties.**
  Jeh, G., Widom, J.
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- **StreaMon: An Adaptive Engine for Stream Query Processing.**
  Babu, S., Widom, J.
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- **Resource Sharing in Continuous Sliding-Window Aggregates.**
  Arasu, A., Widom., J.
  2004
- **Memory-Limited Execution of Windowed Stream Joins.**
  Srivastava, U., Widom, J.
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- **Flexible Time Management in Data Stream Systems.**
  Srivastava, U., Widom., J.
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- **Enabling Privacy for the Paranoids.**
  Aggarwal, G., Bawa, M., Ganesan, P., Garcia-Molina, H., Kenthapadi, K., Mishra, N.
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- **Adaptive Ordering of Pipelined Stream Filters.**
  Babu, S., Motwani, R., Munagala, K., Nishizawa, I., Widom., J.
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- **Incremental computation and maintenance of temporal aggregates** *VLDB JOURNAL*
  Yang, J., Widom, J.
  2003; 12 (3): 262-283
- **Lineage tracing for general data warehouse transformations** *VLDB JOURNAL*
  Cui, Y. W., Widom, J.
  2003; 12 (1): 41-58
- **Exploiting hierarchical domain structure to compute similarity** *ACM TRANSACTIONS ON INFORMATION SYSTEMS*
  Ganesan, P., Garcia-Molina, H., Widom, J.
  2003; 21 (1): 64-93
- **Extended version** *appeared in SIAM Journal on Computing*
  Feder, T., Motwani, R., Panigrahy, R., Olston, C., Widom, J.
  2003; 2 (32): 538-547
- **Monitoring Stream Properties for Continuous Query Processing**
  Srivastava, U., Babu, S., Widom., J.
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- **Computing the median with uncertainty** *SIAM JOURNAL ON COMPUTING*
  Feder, T., Motwani, R., Panigrahy, R., Olston, C., Widom, J.
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- **An Abstract Semantics and Concrete Language for Continuous Queries over Streams and Relations**
  Arasu, A., Babu, S., Widom., J.
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- **Adaptive Filters for Continuous Queries over Distributed Data Streams.**
  Olston, C., Jiang, J., Widom, J.
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  Feder, T., Motwani, R., Panigrahy, R., Olston, C., Widom, J.
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- **Computing the median with uncertainty** *SIAM JOURNAL ON COMPUTING*
  Feder, T., Motwani, R., Panigrahy, R., Olston, C., Widom, J.
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- **Best-Effort Cache Synchronization with Source Cooperation.**
  Olston, C., Widom, J.
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- **SimRank: A Measure of Structural-Context Similarity.**
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  Arasu, A., Babcock, B., Babu, S., McAlister, J., Widom, J.
  2002
- **Models and Issues in Data Stream Systems.**
  Babcock, B., Babu, S., Datar, M., Motwani, R., Widom, J.
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- **Characterizing Memory Requirements for Queries over Continuous Data Streams**
  Arasu, A., Babcock, B., Babu, S., McAlister, J., Widom, J.
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- **Continuous queries over data streams** *SIGMOD RECORD*
  Babu, S., Widom, J.
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- **Adaptive precision setting for cached approximate values** *ACM SIGMOD International Conference on Management of Data*
  Olston, C., Loo, B. T., Widom, J.
  ASSOC COMPUTING MACHINERY.2001: 355–66
- **Incremental computation and maintenance of temporal aggregates** *17th International Conference on Data Engineering*
  Yang, J., Widom, J.
  IEEE COMPUTER SOC.2001: 51–60
- **A Data Stream Management System for Network Traffic Management.**
  Babu, S., Subramanian, L., Widom., J.
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- **Lineage Tracing for General Data Warehouse Transformations.**
  Cui, Y., Widom, J.
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- **Run-Time Translation of View Tuple Deletions Using Data Lineage.** *Technical Report*
  Cui, Y., Widom, J.
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- **An algebraic approach to static analysis of active database rules** *ACM TRANSACTIONS ON DATABASE SYSTEMS*
  Baralis, E., Widom, J.
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  Goldman, R., Widom, J.
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- **TIP: A temporal extension to Informix** *International Conference on Management of Data*
  Yang, J., Ying, H. C., Widom, J.
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  Cui, Y. W., Widom, J., Wiener, J. L.
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- **Lore: A database management system for XML** *DR DOBBS JOURNAL*
  Goldman, R., McHugh, J., Widom, J.
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- **Temporal view self-maintenance** *7th International Conference on Extending Database Technology*
  Yang, J., Widom, J.
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- **Lineage Tracing in a Data Warehousing System.**
  Cui, Y., Widom, J.
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- **Storing Auxiliary Data for Efficient Maintenance and Lineage Tracing of Complex Views.**
  Cui, Y., Widom, J.
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  Cui, Y., Widom, J.
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- **Practical Applications of Triggers and Constraints: Successes and Lingering Issues.**
  Ceri, S., Cochrane, R., J., Widom, J.
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- **Performance Issues in Incremental Warehouse Maintenance.**
  Labio, W., J., Yang, J., Cui, Y., Garcia-Molina, H., Widom, J.
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- **Computing the Median with Uncertainty.**
  Feder, T., Motwani, R., Panigrahy, R., Olston, C., Widom, J.
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- **Summarizing and Searching Sequential Semistructured Sources.** *Technical Report*
  Goldman, R., Widom, J.
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- **Implementing Parameterized Range Types in an Extensible DBMS.** *Technical Report*
  Yang, J., Widom, J., Brown, P.
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- **Offering a Precision-Performance Tradeoff for Aggregation Queries over Replicated Data.**
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