

Susan B. Davidson

Curriculum Vitae

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Department of Computer and Information Science

University of Pennsylvania

Philadelphia, PA 19104-6389

Education

- **Ph.D. Computer Science**
Princeton University, October, 1982.
Dissertation title: *An Optimistic Protocol for Partitioned Distributed Database Systems*
- **M.S.E., M.A. Computer Science**
Princeton University, October, 1982.
- **B.A. Mathematics**
Cornell University, College of Arts and Sciences, June, 1978.
Graduated *Cum Laude* in Mathematics with distinction in all subjects.

Employment

- University of Pennsylvania: Professor of Computer and Information Science, 1998-present;
Secondary, Genetics Department (School of Medicine) 2000-present.
- University of Pennsylvania: Associate Professor 1989-98.
- University of Pennsylvania: Assistant Professor 1983-1989.
- University of Pennsylvania: Visiting Assistant Professor 1982.

Recent Leadership Positions and Awards:

- Fulbright Scholar, January 1 2004- June 30 2004.
- Hitachi Chair, January 1 2004- June 30 2004.
- Best author award (Computer Networks), February 2003.
- ACM Fellow, November 2001.
- Lenore Rowe Williams Award (AWFA), April 2002.
- Invited by the British Research Council to be a member of an international team to review the status of Computer Science Research in the UK (June 2001).
- Interim-Director, Center for Bioinformatics, University of Pennsylvania.
- Track Director in Computational Biology/Bioinformatics and member of Executive Committee, Masters of Biotechnology Program, University of Pennsylvania.

- General Chair, 1999 International Conference on the Management of Data (SIGMOD99).
- ACM Service Award for performance as General Chair of 3rd International Conference on Parallel and Distributed Information Systems (1994), and for General Chair of SIGMOD99.
- IEEE Computer Society Certificate of Appreciation “for outstanding performance as co-chair of the 1992 and 1993 Real-Time Systems Symposiums”

Research Interests

- *Databases*: data models and languages, complex object systems, database transformations, data integration, data warehousing, transactions and updates, constraints, biomedical databases.
- *Distributed and real-time systems*: language support and formal methods for distributed real-time programs, real-time database systems.

University Experience

Ph.D. Dissertation Supervision

- Magdi Kamel, *Efficient Enforcement of Integrity Constraints Using Redundant Data* (Ph.D., August 1988). Tenured faculty member at the Naval Postgraduate School in Monterey.
- Victor Wolfe, *Language Constructs for Distributed Real-Time Programming* (Ph.D., August 1991). Tenured faculty member at the University of Rhode Island (Susan Davidson, primary advisor; Insup Lee, co-advisor).
- Aaron Watters, *Constructive Deductive Databases and Partial Information* (Ph.D. August 1992). First Computer Science recipient of an AT&T fellowship. Currently at AT&T (Susan Davidson, primary advisor; Peter Buneman, co-advisor).
- Anthony Kosky, *Transforming Databases with Recursive Data Structures* (December 1995). Currently research scientist at Lawrence Berkeley Labs (Susan Davidson, primary advisor; Peter Buneman, co-advisor).
- Hanene Ben-Abdellah, *GCSR: A Graphical Language for the Specification, Refinement and Analysis of Real-Time Systems* (August 1996). Currently Assistant Professor at Département d’Informatique Faculté des Sciences Economiques et de Gestion, Université de Sfax, Tunisia (Susan Davidson and Insup Lee, co-advisors).
- Carmem Hara (current, projected graduation date 2002), *Reasoning with Constraints in Complex Object Databases*.
- Yi Chen (current, projected graduation date 2004), *Updating Data Warehouses*
- Yifeng Zheng (current, projected graduate date 2005) *Annotating Data*.

Master’s Thesis Supervision

- Mark Winkler, *Performance Analysis of Optimistic and Pessimistic Partition Failure Protocols* (July 1985).

- Ronald Reuss, *Byzantine Agreement and Transaction Commit: A Comparison* (August 1987).
- Bob Greenawalt, *Real-Time Databases: Case Studies and Analysis*, (August 1988). Currently on the faculty at West Point Academy.
- Hartmut Liefke, *Extending CPL/Kleisli With Updates* (May 1997).
- Deborah Pinney, *Integration of RNA and Protein in the GUS Database* (May 2002).

Senior Project Supervision (1990-present): *Class of 1990:* Michael Gilbert; *Class of 1992:* Brian Eck, Adam Finkelstein, Roberto Hiller, David Wetzel; *Class of 1993:* Stephen Golden, Peter Lambrianakos, Jeff Liebert; *Class of 1994:* David Haynes, Paula Mueller, Zahit Sismanoglu; *Class of 1996:* Justin Cohen, Steven Hong; *Class of 1997:* Matthew Grove, Alex Ferrara, Osamu Saito. *Class of 1998:* Janssen Choong. *Class of 1999:* Julie Herman, Alp Franko, Charles Sieh, Sarah Huang. *Class of 2000:* Rich Barilla, Bryan Hopkins, Mitchell Im, Raghavendra Krishnamurthy, Rong Qian, Thomas Peng, Jeff Rosenfeld. *Class of 2001:* Robert Buckman, Judy Evans, Donald Kwon, Glenn Luk, Javier Rodriguez, Sam Sokolovsky, Luke Stokes, Hai Ton, Brian Wong. *Class of 2002:* Rohan Ahmin, Nadir Akram, Kathryn Armstrong, Jeff Braunstein, John Dundon, Ross Friedman, Joel Patton, John Piotrowski, Peter Szocs. *Class of 2003:* Michael Brunswick, Shafqat Islam, Sean Prendergast, Arie Segiv.

Courses Taught

- CIS 650- Seminar in Distributed Database Systems
(University of Pennsylvania, Spring 1983-1987; Spring 1990-1991; Summer 1994; Spring 1997, 2001, 2002)
A graduate level seminar course whose topic varies from year to year. Sample subjects have been: distributed databases, object-oriented databases, heterogeneous databases, and integrating biomedical databases. Readings are taken from current proceedings and journals. Typical enrollment: 15-25.
- CIS 550- Introduction to Database Systems
(University of Pennsylvania, Summer 1983, Fall 1984, Fall 1986-93, Fall 1995-97, 2002)
An introductory graduate level course using *Principles of Database Systems* by J.D. Ullman. Typical enrollment: 40-50.
- CIS 535 (BIO 536)- Computational Biology
(University of Pennsylvania, Fall 1995-6)
Co-taught with W. Ewens, S. Kannan, C. Overton, D. Roos, T. Warnow. Introductory course for the new program in Computational Biology. Current enrollment: 20.
- CIS 635 (BIO 537)- Seminar in Computational Biology
(University of Pennsylvania, Spring 1996-7; Fall 1999-present)
Co-taught with W. Ewens, S. Kannan, and others. Seminar course for the new program in Computational Biology. Current enrollment: 20.
- CSE400- Senior Projects
(University of Pennsylvania, Fall 1985-6)
Organized the Senior Design Class. Lectures on and supervision of technical writing and oral presentations (*Technical Writing* by Lannon).

- CSE 330 - Design Principles of Information Systems
(University of Pennsylvania, Spring 1987, 1989; Fall 1990; Spring 1992, 1993-94, 1996; Fall 1998-present)
An upper level undergraduate course based on Ragu Ramakrishnan's *Database Management Systems*.
- CSE 220- Algorithms and Data Structures
(University of Pennsylvania, CSE220 - Fall 1983, Spring 1988) A sophomore/junior level core course based on Aho, Hopcroft and Ullman's *The Design and Analysis of Computer Algorithms*.
- CSE220a- Data and File Structures
(University of Pennsylvania, CSE220b - Fall 1982) A freshman/sophomore level course based on Tanenbaum and Augenstein's *Data Structures Using Pascal*.

University Service

- **University Committees:** Senate Executive Committee (1987-89), Information Center Committee (1983), University Minor in Computer Science Committee (Spring 1994), Master's of Biotechnology executive committee (1997), Genomics Institute executive committee (2001-present), Gender Equity Committee (2000), Planning Committee for Life Sciences (2001), SEPA Bioinformatics Greenhouse Committee(2002).
- **School Committees:** Undergraduate Affairs Committee (1990-1992), Personnel Committee (1989-1990), Academic Performance Committee (1985-1990), "Forty years of computing at Penn" Committee (1985-86), Pender Award Committee (1985), Library Committee (1985), Faculty Council (Chair, 1998-2000).
- **Departmental Committees:** Chairperson Search Committee (1989, 1992), Ph.D. Written Preliminary Examination Committee (1984-86), Systems Faculty Search Committee (1994-1997), Algorithms Faculty Search Committee (1995), Chair Faculty Search Committee (1996), Associate Chair Committee (1997), Meeting Moderator (1997-8).
- CIS Undergraduate Group Chair (1990-92): Major accomplishments: revision of CSE-BSE program, significant rejuvenation of the Dining Philosophers, establishment of the X-lab through numerous grants (internal as well as external).
- PhD and Postdoc Program in Computational Biology: participated in NSF Research Training Grant for establishing a multi-disciplinary research training program in computational biology. Much of the success in obtaining this grant was based on existing active collaborations between the database research group (P. Buneman, S.B. Davidson and V. Tannen) and the informatics group in support of the Human Genome Project Center for Chromosome 22 (C. Overton and D. Searls). More recently, have helped established a PhD program in the Biomedical Graduate Studies program for Genomics and Computational Biology (R. Speilman, D. Roos, W. Ewens).
- Masters of Biotechnology, track in Computational Biology/Bioinformatics: am administering the track in conjunction with Dan Hammer, director of the Masters of Biotechnology program. Responsibilities include admissions as well as advising all students.

- BAS in Computational Biology: designed and am administering an SEAS undergraduate degree in computational biology. Also participated with creating a sister degree in SAS within Biology.
- Genomics and Computational Biology degree program (track within Biomedical Graduate Studies): founding member.
- Center for Bioinformatics: C. Overton, S. Davidson (Interim-Director), P. Buneman and V. Tannen, have established a center for the organization, analysis, and visualization of biomedical information through the Genomics Institute with co-sponsorship by the Institute for Research in Cognitive Science (IRCS). It is a major initiative aiming to bring in an additional 3PI's within SOM and potentially SEAS and SAS. W. Ewens (Biology- SAS) heads up the educational component of the center.

Professional Experience

Professional Activities

See also leadership positions and awards.

- Associate Editor, Journal of Computational Biology (1997-present).
- Member, Institute for Research in Cognitive Science (1997-present).
- Steering Committees: Testing and Evaluation for ONR's Real-Time System Initiative (Summer 1988), Conference on Parallel and Distributed Information Systems (1995), Bioinformatics Workshop (National Research Council, February 2000).
- General Chair: Real-Time Systems Symposium (with I. Lee, December 1993), 3'rd International Symposium on Parallel and Distributed Information Systems (September 1994).
- Organizer: ARO Workshop on Integrating Heterogeneous Information Systems (March 8-9, 1993).
- Program Chair: Real-Time Systems Symposium (with I. Lee, December 1992).
- Tutorials Chair: International Conference on Very Large Database 2000.
- Program Committees: IEEE Symposium on Reliable Distributed Systems (October 1989), Real-Time Systems Symposium (December 1989), 10'th International Conference on Distributed Computing Systems (May 28-June 1, 1990), Conference on Parallel and Distributed Information Systems (December 1991) Conference on Reliable Distributed Systems (October 1994), 3'rd International Conference on Information and Knowledge Management (November 1994), 15th International Conference on Distributed Computing Systems (June 1995), Meeting on Interconnecting Molecular Biology Databases (August 1994, July 1995), International Conference on Very Large Databases (September 1995, 1997, 1999, 2001), International Semantics Web Conference (2003), SIGMOD (May 1996, 2003), Database Programming Languages (August 1997), Data Engineering (1997, 1998), Brazilian Symposium on Databases (1998, 2003), PODS (2000).

- Publicity Chair: Joint Conference ACM SIGMOD International Conference on Management of Data and Principles of Database Systems '93 (May 1993).
- Grant Panels: NSF (1988, 1993, 1995-7, 1999, 2000), NIH (1999), Sloan/DOE Bioinformatics Fellowships (2002-3).
- Panels: “Scaling the Tower of Babel: Data Integration and Warehousing with the WWW,” Conference on Information Technology Applications in Biomedicine (November 2000), “Time Constrained Communication,” 6'th Workshop on Real-Time Operating Systems (May 1989), “Practicality of Distributed System Design Tools,” 9'th International Conference on Distributed Computing Systems (June 1989), “Issues in Application Development,” Workshop on Operating Systems for Mission Critical Computing, College Park MD (Sept. 19-21, 1989).
- Professional Consulting: General Electric Aerospace (1993), Smith-Kline Beecham (1995-96).

Journal and Book Reviewing

- ACM: *Communications of the ACM*, *Transactions on Database Systems*, *Transactions on Programming Languages and Systems*.
- IEEE: *Transactions on Computers*, *Transactions on Software Engineering*, *Transactions on Knowledge and Data Engineering*.
- *Journal of Parallel and Distributed Computing*, *Information Processing Letters*
- NSF and ARO Grant Proposals.
- Texts in algorithms and data structures and in database systems for Reston Publishing Company, and Allyn and Bacon Publishing Company.
- Conferences: IEEE Symposium on Reliability in Distributed Software and Database Systems, IEEE Real Time Systems Symposium, IEEE Distributed Computing Systems, IEEE Data Engineering, ACM SIGMOD, ACM Principles on Database Systems, Meeting on Interconnecting Molecular Biology Databases, Database Programming Languages, Very Large Databases.

Research Experience

Pending Grants

- NSF DBABS, “Semantic Compliance in Biomedical Data Exchange” (Susan Davidson, PI; Chris Stoeckert, Val Tannen co-PI). \$1,020,725 (Sept. 1, 2003- August 31, 2006).
- SmithKline Beecham, “Tools for Integrating Biological Data Sources,” (V. Tannen, PI; S. Davidson, co-PI) \$99,899 (Jan. 1, 2003- Dec. 31, 2004).
- NIH pre-NPEBC, “Comparative Approaches to Bio-Knowledge Discovery” (Junhyong Kim, PI; S. Davidson, co-PI). \$2,327,867 (Sept. 1, 2003 to Aug. 31, 2006).

- SEPA Greenhouse, “Philadelphia Greenhouse Consortium for Bioinformatics: Collaborative Research, Education and Training” (Collaboration with the University of Pennsylvania, Drexel University, Temple University, University of the Sciences, Children’s Hospital, WIS-TAR Institute, Fox Chase Cancer Research Center, Thomas Jefferson University). \$2,319,400 (June 1, 2003- April 30, 2006).
- NSF Partnership for Innovation “Philadelphia Partnership for Innovations in Biotechnology,” (Aydin Tozerin, PI; S. Davidson, co-PI; Gary KGurtzman, co-PI). \$320,000 (\$150,000 subcontract to UPenn) (November 1, 2003- October 31, 2005).
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Current Research Grants

- NSF ITR, “Mining the Bibliome – Information Extraction from the Biomedical Literature.” (Aravind Joshi, PI, Mark Liberman, Susan Davidson co-PI) \$4,976,335 (Sept. 1, 2002 - Aug. 31, 2005).
- NSF (Database Activities in the Biological Sciences), “Refreshing Curated Warehouses,” (Susan Davidson, PI; Peter Buneman, Chris Overton, co-PI) \$561,769 (10/1/1999-9/30/2003).
- NSF (Digital Libraries Initiative), “Data Provenance,” (Peter Buneman, PI; Susan Davidson, Val Tannen, co-PI) \$504,990 (6/1/1999-5/31/2003).

Completed Grants

- NIH NCRB (Facilities Renovation), “Center for Bioinformatics” (William Kelley, PI; Susan Davidson and Chris Overton, ghostwriters) \$692,000.
- ARO “Engineering Robust Distributed Databases,” (Val Tannen, PI; Susan Davidson, Peter Buneman, co-PI) \$270,000 (6/1/98-6/30/01).
- DARPA, “Ultra-High Speed Optical Network Architecture,” (Davidson, PI on a subcontract from Jonathan Smith) \$300,000 (1/1/2000-12/31/2001).
- SmithKline Beecham, “Tools for Integrating Biological Data Sources,” (V. Tannen, PI; S. Davidson, C. Overton, P. Buneman, co-PI) \$542,588 (7/1/1996-12/31/2000).
- DOE, “Schema Transformations with Biological Databases” (with Chris Overton and Peter Buneman), \$1,225,799 (September 1, 1995 - August 31, 1998).
- ARPA, “Transformation Languages for Heterogeneous Data Sources” (with Peter Buneman, Val Tannen and Larry Alexander), \$400,000 (August 1, 1994 – Feb 28, 1998).
- ARO, “Extending Database Integration Technology” (with Peter Buneman, Val Tannen, and Chris Overton), \$495,000 (May 1, 1995 – April 30, 1998).
- NSF-CISE (Planning and Equipment Grant), “Telementoring: A Novel Approach to Teaching Undergraduate Computer Scientists” (with Jonathan Smith, David Farber, Insup Lee and Ira Winston), \$400,000 (August 1, 1992- July 31, 1995).

- Sun Academic Equipment Grant, “Telementoring: A Novel Approach to Teaching Undergraduate Computer Scientists” (with Jonathan Smith, David Farber, Insup Lee and Ira Winston), \$85,000 (June 1, 1993 - May 31, 1996).
- NSF-ILI (Equipment Grant), “Teleconferenced Workstations: Improving Experimentation in Undergraduate Education” (with Insup Lee and Jonathan Smith), \$76,000 (July 1, 1994- June 30, 1996).
- NSF, “Mediated Access to Biological Databases and Applications” (PI, with Chris Overton and Peter Buneman) \$200,000, (July 1, 1994- June 30, 1996).
- AT&T, “Study of Protocol Verification Issues for DMI” (with Insup Lee), \$175,000 (Sept. 1986- August 1989).
- AT&T, “A Programming System for Heterogeneous Distributed Databases” (with Peter Buneman), \$175,000 (Sept. 1986- August 1988).
- ARO, “Distributed Expert Systems” (with Tim Finin, Insup Lee, Lokendra Shastri, and Peter Buneman), \$75,000 (Sept. 1986 - June 1987).
- NSF Equipment Grant, “A Distributed Testbed for Real-time Active Sensing” (with Insup Lee and K. Wohn), \$29,305 (May 1988- Oct. 1989).
- ONR, “Formally Integrating Real-Time Specification and Implementation” (with Insup Lee), \$408,000 (Oct. 1988- Sept. 1991).
- ARO, “New Techniques for Merging Database Schemas” (with Peter Buneman), \$65,988 (May 1, 1991- April 30, 1993).
- ONR, “Formally Integrating Real-Time Specification and Implementation” (with Insup Lee), \$258,928 (Oct. 1991- Sept. 1993).
- NSF, “A Formal Approach to Real-Time Specification and Analysis” (with Insup Lee), \$407,961 (June 1991- Nov. 1994).
- University of Pennsylvania Undergraduate Initiatives Fund (Equipment Grant), “A Laboratory For Visualizing Computing Paradigms,” (Project Director, with Peter Buneman and Insup Lee), \$41,282 (September 1991- June 1992).
- University of Pennsylvania Undergraduate Initiatives Fund (Equipment Grant), “A Meta Language Approach to Introductory Programming,” (with Peter Buneman, Val Tannen, Carl Gunter, Jonathan Smith and Ira Winston), \$ 41,143 (September 1992- June 1993).

Invited Talks and Short Courses (1986-present):

- “Got your data, but what does it mean,” IBM Almaden Research Center (May 15, 2003).
- “Sharing biomedical data with impunity,” Stanford University (May 16, 2003).
- “The Value of an Undergraduate Education in Bioinformatics”, Workshop on Bioinformatics in the Undergraduate Curriculum (March 21, 2003).

- “A Tale of Two Cultures”, Keynote talk for SSDBM2002 (July 2002).
- “Biologists are from Venus, Computer Scientists are from Mars”, University of Alabama (April 26,2002).
- “Superimposing Biological Data and Knowledge”, Workshop on Computer Science for Genomes to Life (DOE, March 9, 2002).
- “Mars versus Venus: Are there database research issues in bioinformatics?” Brazilian Symposium on Databases (Oct. 1, 2001).
- Tutorial on Constraints for XML, Brazilian Symposium on Databases (Oct. 3, 2001, with Wenfei Fan).
- “Refreshing the Tower of Babel,” Jackson Lab (July 14, 2000).
- “Building and Maintaining Warehouses for Genomic Applications,” Invited talk to the Fungal Genomics Conference (Athen, GA; July 27, 2000).
- “Refreshing the Tower of Babel,” Distinguished Lecture, University of Chicago, Dept. of Computer Science (December 1, 1999).
- “Biologists are from Venus, Computer Scientists are from Mars,” Oregon Graduate Institute, Dept. of Biochemistry (October 29, 1999).
- “Refreshing the Tower of Babel,” University of Pittsburgh/CMU (July 30, 1999); Oregon Graduate Institute, OCATE Lecture Series (October 29, 1999).
- “Scaling the Tower of Babel and other Database Challenges within Bioinformatics,” University of Texas, Austin (February 24, 1999).
- “Scaling the Tower of Babel and other Database Challenges within Bioinformatics,” University of California, San Diego; University of Southern California (November 3&5, 1998).
- “Scaling the Tower of Babel and other Computer Science Challenges within Bioinformatics,” IME Lecture Series (April 28, 1998).
- “Scaling the Tower of Babel in Heterogeneous Databases,” CIS-Wharton Seminar Series (November 17, 1997).
- “Integrating Biomedical Data Sources Using BioKleisli,” DOE Human Genome Contractor-Grantee Workshop (November 10, 1997).
- “Integrating Heterogeneous Data Sources Using Kleisli,” University of California, Santa Barbara (April 30, 1997).
- “Data Transformations Using Morphase,” Technical University of Darmstadt, Germany (Jan. 6, 1997).
- “Data Mapping for Scientific Databases Using Morphase”, Workshop on Data Mapping and Matching (Washington DC, Nov. 7, 1996).

- “BioKleisli: A Case Study in Integrating Biomedical Databases”, Research Directions in Advanced Information Systems (Glasgow, September 1996).
- “Data Transformations in Biological Data Sources”, INRIA Roquencourt (April 18, 1995).
- “Survey of Computer-Science Approaches to Database Interoperation,” NSF Meeting on Interconnecting Molecular Biology Databases (August 9, 1994).
- “Integrating Heterogeneous Databases in the Human Genome Project,” Penn Mutual Life Insurance (July 29, 1994).
- “The BioDB Project at Penn,” NSF Research Training Grant Site Visit (July 3, 1994).
- “Multidatabases: Integrating Pre-existing Heterogeneous Databases,” University of Pennsylvania Data Management Forum (March 25, 1993).
- “Hotspots in Database Integration,” ARO Workshop on Integrating Heterogeneous Information Systems (Monterey, March 8-9, 1993).
- “A General Approach to Schema Integration,” ARO Workshop on Heterogeneous Distributed Database Systems (Philadelphia, Sept. 19-20, 1991).
- ARO Tutorial on Heterogeneous Database Systems, (Monmouth College, Nov. 8-9, 1990): “Transaction Management in Heterogeneous Distributed Databases”
- Harvard University, Aiken Laboratory for Computer Science (March 22, 1990): “A Semantics for Complex Objects and Approximate Answers”
- Boston University, Department of Computer Science (March 21, 1990): “Federated Approximations for Heterogeneous Distributed Databases”
- Wharton School, University of Pennsylvania (Sept. 27, 1989): “Federated Approximations”
- Finger Lakes 89: An Advanced Course on Distributed Systems (Short Course, Cornell University, July 1989): “Replication in Distributed Database Systems”
- Bell Labs, Murray Hill (February 1989): “Approximating Queries”
- University of Toronto (November 1988): “Partial Computation in Real-Time Database Systems”
- University of Illinois (October 1988): “Partial Computation in Real-Time Database Systems”
- UNISYS (June 1988): “Partial Computation in Real-Time Database Systems”
- ARO Short Course on Data and Knowledge Bases (University of Pennsylvania, June 1986-88, May 1989): “Overview of Database Systems”
- University of Arizona (March 1988): “Approximating Queries: A Technique for Querying Heterogeneous Distributed Databases”
- AT&T, Holmdel and Summit (June 1987): “Issues in Fault Tolerant Distributed Databases”

- Workshop on Data and Knowledge Bases (ARO), Fort Gordon GA (March, 1987): “ Tutorial on Distributed Database Systems” & “Current Issues in Database Systems”
- University of Pittsburgh (January 31, 1986): “Partition Failure Protocols: Review and Analysis”
- Princeton University (Spring 1986): “An Overview and Analysis of Partition Failure Protocols”
- University of Delaware (Spring 1986): “Partition Failure Protocols: Review and Analysis”
- Current Issues in Database Systems Conference, held at Rutgers University (May 27, 1986): “A Performance Comparison of Optimistic Versus Conservative Conflict Graph Analysis”

Publications

NOTE: With very few exceptions, I have had a policy of publishing papers with author names listed in alphabetical order.

Refereed Journals

1. "Reasoning about Keys for XML," by P. Buneman, S. Davidson, W. Fan, C. Hara and W.C. Tan. *Information Systems*. To appear.
2. "Keys for XML," by P. Buneman, S. Davidson, W. Fan, C. Hara, and W.C. Tan. *Computer Networks* 39:5 (August 2002, Elsevier Publishers), pp. 473-487. N.B. Best Author Award.
3. "K2/Kleisli and GUS: Experiments in Integrated Access to Genomic Data Sources," by S. Davidson, J. Crabtree, B. Brunk, J. Schug, V. Tannen, C. Overton and C. Stoeckert. *IBM Systems Journal* 40:2, pp. 512-531 (2001).
4. "Semantics of Database Transformations," A. Kosky, S.B. Davidson and P. Buneman. In *Semantics of Databases*, edited by L. Libkin and B. Thalheim, Springer LNCS 1358 (February 1998).
5. "BioKleisli: A Digital Library for Biomedical Researchers," S.B. Davidson, C. Overton, V. Tannen and L. Wong. *Journal of Digital Libraries* 1:1 (November 1996), pp. 36-53.
6. "Challenges in Integrating Biological Data Sources," S.B. Davidson, C. Overton and P. Buneman. *Journal of Computational Biology* 2:4 (Winter 1995), pp 557-572.
7. "Deadlock Prevention in Concurrent Real-time Systems," S.B. Davidson, I. Lee and V. Wolfe. *Real-Time Systems Journal*, 5:3 (October 1993), pp. 305-318.
8. "RTC: Language Support for Real-Time Concurrency," V. Wolfe, S.B. Davidson and I. Lee. *Real-Time Systems Journal*, 5:1 (March, 1993), pp. 63-87.
9. "A Semantics for Complex Objects and Approximate Queries", P. Buneman, S.B. Davidson and A. Watters. Invited paper to *Journal of Computer and System Sciences* 43:1 (August 1991), pp. 170-218. (See below under refereed conference papers.)
10. "Timed Atomic Commitment", S.B. Davidson, I. Lee and V. Wolfe. *IEEE Transactions on Computers* 40:5 (May 1991), pp. 573-583.
11. "A Performance Analysis of Timed Synchronous Communication Primitives," I. Lee and S.B. Davidson. *IEEE Transactions on Computers* 39:9 (Sept. 1990), pp. 1117-1131.
12. "Semi-Materialization: A Technique for Optimizing Frequently Executed Queries," S.B. Davidson and M. Kamel. *Data & Knowledge Engineering* 5 (1990), pp. 93-103. "Querying Independent Databases," P. Buneman, S.B. Davidson and A. Watters. *Information Sciences- an International Journal* 49:3 (November 1989).

13. "Federated Approximations in Heterogeneous Databases," P. Buneman, S.B. Davidson and A. Watters. Invited paper to *IEEE Office Knowledge Engineering*, 3:2 (August 1989), pp. 27-34.
14. "Adding Time to Synchronous Process Communications," I. Lee. and S.B. Davidson. *IEEE Trans. on Computers* C-36:8 (Special issue on Real Time Systems, Aug. 1987), pp. 941-948. (Reprinted in *IEEE Tutorial: Hard Real-Time Systems*, edited by John A. Stankovic and Krithi Ramamritham 1988).
15. "A Performance Comparison of Optimistic versus Conservative Strategies during Partition Failures in Distributed Databases," S.B. Davidson and M. Winkler. *Journal of Management and Information Systems* 4:2 (Fall 1987), pp. 113-133.
16. "Is Byzantine Agreement Useful in a Distributed Database?," S.B. Davidson, H. Garcia-Molina and F. Pittelli. *ACM Trans. on Database Sys.* 11:1 (March 1986), pp. 27-47.
17. "Consistency in a Partitioned Network: a Survey," S.B. Davidson, H. Garcia-Molina and D. Skeen. *ACM Computing Surveys* 17:3 (Sept. 1985), pp. 341-370. Also published in the Japanese journal *Bit*.
18. "Optimism and Consistency in Partitioned Distributed Database Systems," S.B. Davidson. *ACM Trans. on Database Sys.* 9:3 (Sept. 1984), pp. 456-481.

Refereed Conference Proceedings

19. "3XNF: Redundancy Reducing XML Storage in Relations," by Y. Chen, S.B. Davidson and Y. Zheng. VLDB2003 (September 2003).
20. "Propagating XML Constraints to Relations," by S.B. Davidson, W. Fan, C. Hara and J. Qin. ICDE2003.
21. "Validating Keys for XML," by Y. Chen, S.B. Davidson and Y. Zheng. CIKM2002 (November 2002), pp. 446-452.
22. "Reasoning about keys for XML," by P. Buneman, S. Davidson, W. Fan, C. Hara, and W.C. Tan. DBPL (Rome, September 2001).
23. "Keys for XML," by P. Buneman, S. Davidson, W. Fan, C. Hara, and W.C. Tan. WWW10 (Hong Kong, May 2001).
24. "View Maintenance for Hierarchical Semistructured Data," by H. Liefke and S.B. Davidson. DaWaK'00 (London, England, September 6-8, 2000).
25. "Specifying Updates in Biomedical Databases," by H. Liefke and S.B. Davidson. 11th International Conference on Scientific and Statistical Database Management (Cleveland, July 28-30 1999).
26. "Processing Updates on Complex Value Databases," by H. Liefke and S.B. Davidson. *International Resources Management Association International Conference* (Hershey, May 16-19 1999).

27. "Reasoning about Nested Functional Dependencies," C. Hara and S.B. Davidson. *Proceedings of the Symposium on Principles of Database Systems* (Philadelphia, May 31-June 2 1999), pp. 91-100.
28. "Querying an Object-Oriented Database Using CPL," S.B. Davidson, C. Hara and L. Popa. *Proceedings of the Brazilian Symposium on Databases* (Oct. 1997), pp. 137-153.
29. "WOL: A Language for Database Transformations and Constraints," S.B. Davidson and A. Kosky. *Proceedings of the International Conference of Data Engineering* (April 1997), pp. 55-65.
30. "Adding Structure to Unstructured Data," P. Buneman, S. Davidson, M. Fernandez and D. Suciu. *International Conference on Database Theory, Springer LNCS 1* (January 1997), pp. 336-351.
31. "A Query Language and Optimization Techniques for Unstructured Data," P. Buneman, S.B. Davidson, G. Hillebrand and D. Suciu. *Proceedings of SIGMOD'96* (May 1996), pp. 505-516.
32. "Programming Constructs for Unstructured Data," P. Buneman, S.B. Davidson and D. Suciu. *Proceedings of the Workshop on Database Programming Languages* (Sept. 1995).
33. "A Data Transformation System for Biological Data Sources," P. Buneman, S.B. Davidson, K. Hart, C. Overton and L. Wong. *Proceedings of the 21'st International Conference on Very Large Data Bases* (September 1995), pp. 158-169.
34. "Facilitating Transformations in a Human Genome Project Database," S.B. Davidson, A. Kosky and B. Eckman. *3rd International Conference on Information and Knowledge Management* (November 1994), pp. 423-432.
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