

Jennifer Lundelius Welch

Parasol Laboratory

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Research Interests: Algorithms and lower bounds for distributed computing systems, including mobile ad hoc networks and metamorphic robot systems. Specification, implementation and application of distributed shared objects, particularly randomized ones. Communication network protocols. Timing models and clock synchronization. Modularity in design and analysis of distributed algorithms.

Education

- MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA (1982 to 1988)
Ph.D. (Computer Science), 1988.
Thesis entitled *Topics in Distributed Computing: The Impact of Partial Synchrony, and Modular Decomposition of Algorithms*.
S.M. (Computer Science), 1984.
Thesis entitled *Synchronizing Clocks in a Distributed System*.
- THE UNIVERSITY OF MASSACHUSETTS, Amherst, MA (1979 to 1980)
Graduate coursework in computer science and linguistics.
- THE UNIVERSITY OF TEXAS AT AUSTIN, Austin, TX (1975 to 1979)
B.A. (Plan II) summa cum laude, May 1979.
Majored in a liberal arts honors program with a concentration in mathematics.

Professional Experience

- TEXAS A&M UNIVERSITY, College Station, TX (1992 to present)
Professor, Department of Computer Science (2002 to present)
Interim Department Head, Department of Computer Science (2001 to 2002)
Associate Professor, Department of Computer Science (1996 to 2002)
Assistant Professor, Department of Computer Science (1992 to 1996)
- THE UNIVERSITY OF NORTH CAROLINA, Chapel Hill, NC (1989 to 1992)
Assistant Professor, Department of Computer Science.
- GTE LABORATORIES INCORPORATED, Waltham, MA (1988 to 1989)
Member of Technical Staff, Intelligent Database Systems Department.
- AT&T BELL LABORATORIES, Murray Hill, NJ (summer 1986)
Member of Technical Staff.
- SIPES, WILLIAMSON & ASSOCIATES, Midland, TX (1981 to 1982)
Applications Fortran programmer at a petroleum engineering consulting company.
- TRACOR, INC., Austin, TX (1980 to 1981)
Scientific Fortran programmer at a technical contractor for the Navy.

Honors and Awards

- Regent’s Professor Award, Texas A&M University System, 2008.
- Crawford Service Award, Texas A&M University Dwight Look College of Engineering, 2008.
- Chevron II Professorship, Texas A&M University Dwight Look College of Engineering, November 2004.
- IEEE Education Society Hewlett-Packard Harriet B. Rigas Award for outstanding woman engineering educator, October 2004.
- TEES Fellow, Dwight Look College of Engineering, Texas A&M University, 2003.
- Lockheed Martin Aeronautics Company Award for Excellence in Engineering Teaching, Texas A&M University, 2003.
- Lockheed Martin Aeronautics Company Award for Excellence in Engineering Teaching, Texas A&M University, 2000.
- The Association of Former Students of Texas A&M University, Faculty Distinguished Achievement Award in Teaching, Dwight Look College of Engineering, Texas A&M University, 2000.
- Halliburton Fellow, Dwight Look College of Engineering, Texas A&M University, 1998–1999.
- National Science Foundation Presidential Young Investigator Award, 1991.
- IBM Faculty Development Award, 1990.

Publications

Textbook

1. Hagit Attiya and Jennifer Welch, *Distributed Computing: Fundamentals, Simulations and Advanced Topics, Second Edition*, John Wiley & Sons, 414 pp., March 2004.

In Refereed Journals

1. Shlomi Dolev, Elad Schiller, and Jennifer L. Welch, “Random Walk for Self-Stabilizing Group Communication in Ad Hoc Networks,” *IEEE Transactions on Mobile Computing*, vol. 5, no. 7, pp. 893–905, 2006.
2. Yu Chen and Jennifer L. Welch, “Self-Stabilizing Dynamic Mutual Exclusion for Mobile Ad Hoc Networks,” *Journal of Parallel and Distributed Computing*, vol. 65, no. 9, pp. 1072–1089, 2005.
3. Shlomi Dolev, Seth Gilbert, Nancy A. Lynch, Alex Shvartsman, and Jennifer L. Welch, “GeoQuorums: Implementing Atomic Memory in Mobile Ad Hoc Networks,” *Distributed Computing* (special issue of invited papers from DISC 2003), vol. 18, no. 2, pp. 125–155, 2005.
4. Navneet Malpani, Nitin Vaidya, Yu Chen and Jennifer L. Welch, “Distributed Token Circulation on Mobile Ad Hoc Networks,” *IEEE Transactions on Mobile Computing*, vol. 4, no. 2, pp. 154–165, 2005.
5. Hyunyoung Lee and Jennifer L. Welch, “Randomized Registers and Iterative Algorithms,” *Distributed Computing*, vol. 17, no. 3, pp. 209–221, 2005.
6. Shlomi Dolev and Jennifer L. Welch, “Self-Stabilizing Clock Synchronization in the Presence of Byzantine Faults,” *Journal of the ACM*, Vol. 51, No. 5, pp. 780–799, 2004.
7. Jennifer E. Walter, Jennifer L. Welch, and Nancy A. Amato, “Distributed Reconfiguration of Metamorphic Robot Chains,” *Distributed Computing*, Vol. 17, No. 2, pp. 171–189, 2004.
8. Injong Rhee and Jennifer L. Welch, “The Impact of Timing Knowledge on the Session Problem,” *SIAM Journal on Computing*, Vol. 32, No. 4, pp. 1007–1039, 2003.

9. Hyunyoung Lee, Nitin Vaidya, and Jennifer L. Welch, "Location Tracking Using Quorums in Mobile Ad-Hoc Networks," *Ad Hoc Networks*, Elsevier Science, Vol. 1, No. 4, pp. 371–381, Nov. 2003.
10. Jennifer E. Walter, Jennifer L. Welch, and Nancy M. Amato, "Concurrent Metamorphosis of Hexagonal Robot Chains into Simple Connected Configurations," *IEEE Transactions on Robotics and Automation*, Vol. 18, No. 6, pp. 945–956, Dec. 2002.
11. Jennifer E. Walter, Jennifer L. Welch, and Nitin Vaidya, "A Mutual Exclusion Algorithm for Ad Hoc Mobile Networks," *Wireless Networks*, Vol. 7, No. 6, pp. 585–600, Nov. 2001.
12. Saad Biaz and Jennifer L. Welch, "Closed Form Bounds for Clock Synchronization Under Simple Uncertainty Assumptions," *Information Processing Letters*, Vol. 80, No. 3, pp. 151–157, 2001.
13. Soma Chaudhuri, Martha J. Kosa, and Jennifer L. Welch, "One-Write Algorithms for Multivalued Regular and Atomic Registers," *Acta Informatica*, Vol. 37, pp. 161–192, 2000.
14. Shlomi Dolev, Michael Kate, and Jennifer L. Welch, "A Competitive Analysis for Retransmission Timeout," *Networks*, Vol. 34, No. 1, pp. 73–80, 1999.
15. Hagit Attiya, Soma Chaudhuri, Roy Friedman, and Jennifer L. Welch, "Shared Memory Consistency Conditions for Non-Sequential Execution: Definitions and Programming Strategies," *SIAM Journal on Computing*, Vol. 27, No. 1, pp. 65–89, Feb. 1998.
16. Injong Rhee and Jennifer L. Welch, "Time Bounds on Synchronization in a Periodic Distributed System," *Information Processing Letters*, Vol. 64, No. 2, pp. 87–93, 1997.
17. Shlomi Dolev and Jennifer L. Welch, "Wait-free Clock Synchronization," *Algorithmica*, Vol. 18, pp. 486–511, 1997.
18. Shlomi Dolev and Jennifer L. Welch, "Crash-Resilient Communication in Dynamic Networks," *IEEE Transactions on Computers*, Vol. 46, No. 1, pp. 14–26, Jan. 1997.
19. Hosame Abu-Amara, Brian A. Coan, Shlomi Dolev, Arkady Kanevsky, and Jennifer L. Welch, "Self-Stabilizing Topology Maintenance Protocols for High-Speed Networks," *IEEE/ACM Transactions on Networking*, Vol. 4, No. 6, pp. 902–912, Dec. 1996.
20. Shlomi Dolev, Dhiraj K. Pradhan, and Jennifer L. Welch, "Modified Tree Structure for Location Management in Mobile Environments," *Computer Communications*, Vol. 19, pp. 335–345, 1996.
21. Soma Chaudhuri, Brian A. Coan, and Jennifer L. Welch, "Using Adaptive Timeouts to Achieve At-Most-Once Message Delivery," *Distributed Computing*, Vol. 9, pp. 109–117, 1995.
22. Hagit Attiya, Shlomi Dolev, and Jennifer L. Welch, "Connection Management Without Retaining Information," *Information and Computation*, Vol. 123, No. 2, pp. 155–171, Dec. 1995.
23. Hagit Attiya and Jennifer L. Welch, "Sequential Consistency versus Linearizability," *ACM Transactions on Computer Systems*, vol. 12, no. 1, pp. 91–122, May 1994.
24. Soma Chaudhuri and Jennifer L. Welch, "Bounds on the Costs of Multivalued Register Implementations," *SIAM Journal on Computing*, vol. 23, no. 2, pp. 335–354, Apr. 1994.
25. Jennifer L. Welch and Nancy A. Lynch, "A Modular Drinking Philosophers Algorithm," *Distributed Computing*, vol. 6, pp. 233–244, 1993.
26. Brian A. Coan and Jennifer L. Welch, "Modular Construction of an Efficient 1-Bit Byzantine Agreement Protocol," *Mathematical Systems Theory*, vol. 26, no. 1, pp. 131–154, 1993.
27. Brian A. Coan and Jennifer L. Welch, "Modular Construction of a Byzantine Agreement Protocol with Optimal Message Bit Complexity," *Information and Computation*, vol. 97, no. 1, pp. 61–85, Mar. 1992.

28. Brian A. Coan and Jennifer Lundelius Welch, "Transaction Commit in a Realistic Timing Model," *Distributed Computing*, vol. 4, no. 2, pp. 87-103, June 1990.
29. Jennifer Lundelius Welch, "Simulating Synchronous Processors," *Information and Computation*, vol. 74, no. 2, pp. 159-171, Aug. 1987.
30. Jennifer Lundelius Welch and Nancy Lynch, "A New Fault-Tolerant Algorithm for Clock Synchronization," *Information and Computation*, vol. 77, no. 1, pp. 1-36, Apr. 1988.
31. Jennifer Lundelius and Nancy Lynch, "An Upper and Lower Bound for Clock Synchronization," *Information and Control*, vol. 62, nos. 2/3, pp. 190-204, Aug./Sep. 1984.

In Refereed Conferences

1. Rebecca Ingram, Patrick Shields, Jennifer E. Walter, and Jennifer L. Welch, "An Asynchronous Leader Election Algorithm for Dynamic Networks," IEEE International Parallel and Distributed Processing Symposium, 2009, to appear.
2. Srikanth Sastry, Scott Pike, and Jennifer L. Welch, "Crash Fault Detection in Celerating Environments," IEEE International Parallel and Distributed Processing Symposium, 2009, to appear.
3. Hagit Attiya, Alex Kogan, and Jennifer L. Welch, "Efficient and Fault-Tolerant Local Mutual Exclusion in Mobile Ad Hoc Networks," *Proc. 28th International Conference on Distributed Computing Systems*, 2008.
4. Vijitashwa Pandey, Deborah Thurston, Khushboo Kanjani and Jennifer Welch, "Distributed Data Sources for Lifecycle Design," *Proc. 16th International Conference on Engineering Design (ICED)*, 2007.
5. Faith Ellen, Siva Subramanian, and Jennifer L. Welch, "Maintaining Information About Nearby Nodes in a Mobile Environment," *Proc. 8th International Conference on Distributed Computing and Networking (ICDCN)*, 2006.
6. Hagit Attiya, David Hay, and Jennifer L. Welch, "Optimal Clock Synchronization under Energy Constraints in Wireless Ad-Hoc Networks," *Proc. 9th International Conference on Principles of Distributed Systems (OPODIS)*, 2005.
7. Yu Chen and Jennifer L. Welch, "Location-based Broadcasting for Dense Mobile Ad Hoc Networks," *Proc. 8th ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, pp. 63-70, 2005.
8. Shlomi Dolev, Seth Gilbert, Nancy A. Lynch, Elad Schiller, Alex A. Shvartsman, and Jennifer L. Welch, "Virtual Mobile Nodes for Mobile Ad Hoc Networks," *Proc. 18th International Conference on Distributed Computing (DISC)*, pp. 230-244, Oct. 2004.
9. Guangtong Cao and Jennifer L. Welch, "Accurate Multihop Clock Synchronization in Mobile Ad Hoc Networks," *Proc. IEEE International Workshop on Mobile Wireless Networking*, pp. 13-20, Aug. 2004.
10. Cheng Shao, Evelyn Pierce, and Jennifer L. Welch, "Multi-Writer Consistency Conditions for Shared Memory Objects," *Proc. 17th International Conference on Distributed Computing (DISC)*, pp. 106-120, Oct. 2003.
11. Shlomi Dolev, Seth Gilbert, Nancy A. Lynch, Alex A. Shvartsman, and Jennifer L. Welch, "GeoQuorums: Implementing Atomic Memory in Ad Hoc Networks", *Proc. 17th International Conference on Distributed Computing (DISC)*, pp. 3076-320, Oct. 2003.

12. Shlomi Dolev, Elad Schiller, and Jennifer L. Welch, "Random Walk for Self-Stabilizing Group Communication in Ad-Hoc Networks," *Proc. 21st Symposium on Reliable Distributed Systems*, pp. 70–79, Oct. 2002.
13. Yu Chen and Jennifer L. Welch, "Self-Stabilizing Mutual Exclusion Using Tokens in Mobile Ad Hoc Networks," *Proc. 6th International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications*, pp. 34–42, Sep. 2002.
14. Hyunyoung Lee and Jennifer L. Welch, "Randomized Shared Queues Applied To Distributed Optimization Algorithms," *Proc. 12th International Symposium on Algorithms and Computation (ISAAC)*, pp. 587–598, Dec. 2001.
15. Navneet Malpani, Nitin Vaidya and Jennifer L. Welch, "Distributed Token Circulation in Mobile Ad Hoc Networks," *Proc. 9th International Conference on Network Protocols (ICNP)*, pp. 4–13, Nov. 2001.
16. Hyunyoung Lee and Jennifer L. Welch, "Applications of Probabilistic Quorums to Iterative Algorithms," *Proc. 21st IEEE International Conference on Distributed Computing Systems (ICDCS)*, pp. 21–30, Apr. 2001.
17. Navneet Malpani, Jennifer L. Welch, and Nitin Vaidya, "Leader Election Algorithms for Mobile Ad Hoc Networks," *Proc. 4th International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (DIAL M)*, pp. 96–103, Aug. 2000.
18. Jennifer E. Walter, Jennifer L. Welch, and Nancy Amato, "Distributed Reconfiguration of Metamorphic Robot Chains," *Proc. 19th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 171–180, July 2000.
19. Jennifer E. Walter and Jennifer L. Welch, "Hazard-Free Connection Release," *Proc. International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, pp. 1668–1672, June/July 1997.
20. Sundarrajan Kanthadai and Jennifer L. Welch, "Implementation of Recoverable Distributed Shared Memory by Logging Writes," *Proc. 16th International Conference on Distributed Computing Systems (ICDCS)*, pp. 116–124, May 1996.
21. Injong Rhee and Jennifer L. Welch, "Time Bounds on the Response Time for the Dining Philosophers Problem," *Proc. International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, Nov. 1995.
22. Shlomi Dolev, Michael Kate, and Jennifer L. Welch, "A Competitive Analysis for Retransmission Timeout," *Proc. 15th International Conference on Distributed Computing Systems (ICDCS)*, pp. 450–455, May/June 1995.
23. Shlomi Dolev, Dhiraj K. Pradhan, and Jennifer L. Welch, "Modified Tree Structure for Location Management in Mobile Environments," *Proc. 14th Annual Joint Conference of IEEE Computer and Communication Societies (INFOCOM)*, pp. 530–537, Apr. 1995.
24. Hagit Attiya, Shlomi Dolev, Jennifer L. Welch, "Connection Management Without Retaining Information," *Proc. 28th Annual Hawaii International Conference on System Sciences (HICSS)*, Vol. II (Software Technology), pp. 622–631, Jan. 1995.
25. Hosame Abu-Amara, Brian Coan, Shlomi Dolev, Arkady Kanevsky, and Jennifer L. Welch, "A Fault-Tolerant Layered Approach to Fiber Optic Networks," *Proc. Conference on High-Speed Networking and Multimedia Computing, IS&T/SPIE Symposium on Electronic Imaging Science & Technology*, pp. 380–391, Feb. 1994.

26. Shlomi Dolev and Jennifer L. Welch, "Crash Resilient Communication in Dynamic Networks," *Proc. 7th International Workshop on Distributed Algorithms (WDAG)* (Springer-Verlag LNCS 725), pp. 129–144, Sep. 1993.
27. Shlomi Dolev and Jennifer L. Welch, "Wait-Free Clock Synchronization," *Proc. 12th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 97–108, Aug. 1993.
28. Hagit Attiya, Soma Chaudhuri, Roy Friedman, and Jennifer L. Welch, "Shared Memory Consistency Conditions for Non-Sequential Execution: Definitions and Programming Strategies," *Proc. 5th ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, pp. 241–250, July 1993.
29. Injong Rhee and Jennifer L. Welch, "The Impact of Time on the Session Problem," *Proc. 11th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 191–202, Aug. 1992.
30. Soma Chaudhuri, Martha Kosa, and Jennifer L. Welch, "Upper and Lower Bounds for One-Write Multivalued Regular Registers," *Proc. 3rd IEEE Symposium on Parallel and Distributed Processing (SPDP)*, pp. 134–141, Dec. 1991.
31. Soma Chaudhuri, Brian A. Coan, and Jennifer L. Welch, "Using Adaptive Timeouts to Achieve At-Most-Once Message Delivery," *Proc. 5th International Workshop on Distributed Algorithms (WDAG)* (Springer-Verlag LNCS 579), pp. 151–166, Oct. 1991.
32. Hagit Attiya and Jennifer L. Welch, "Sequential Consistency vs. Linearizability," *Proc. 3rd ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, pp. 304–315, July 1991.
33. Soma Chaudhuri and Jennifer L. Welch, "Bounds on the Costs of Register Implementations," *Proc. 4th International Workshop on Distributed Algorithms (WDAG)* (Springer-Verlag LNCS 486), pp. 402–421, Sep. 1990.
34. Brian A. Coan and Jennifer L. Welch, "A Byzantine Agreement Protocol with Optimal Message Bit Complexity," *Proc. 27th Allerton Conference on Communication, Control and Computing*, pp. 1062–1071, Sep. 1989.
35. A. Prasad Sistla and Jennifer L. Welch, "Efficient Distributed Recovery Using Message Logging," *Proc. 8th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 223–238, Aug. 1989.
36. Brian A. Coan and Jennifer L. Welch, "Modular Construction of Efficient Byzantine Agreement Protocols," *Proc. 8th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 295–306, Aug. 1989.
37. Jennifer Lundelius Welch, Leslie Lamport, and Nancy Lynch, "A Lattice-Structured Proof Technique Applied to a Minimum Spanning Tree Algorithm," *Proc. 7th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 28–43, Aug. 1988.
38. Brian A. Coan and Jennifer Lundelius, "Transaction Commit in a Realistic Fault Model," *Proc. 5th ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 40–51, Aug. 1986.
39. Jennifer Lundelius and Nancy Lynch, "A New Fault-Tolerant Algorithm for Clock Synchronization," *Proc. 3rd ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 75–88, Aug. 1984.

Selected Other Publications and Presentations

1. Shlomi Dolev, Seth Gilbert, Elad Schiller, Alex Shvartsman and Jennifer L. Welch, "Brief Announcement: Autonomous Virtual Mobile Nodes," *Proc. 17th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, p. 215, July 2005.
2. Jennifer E. Walter, Jennifer L. Welch, and Nancy Amato, "Distributed Reconfiguration of Hexagonal Metamorphic Robots in Two Dimensions," in *SPIE Sensor Fusion and Decentralized Control in Robotic Systems III*, Proc. of SPIE Vol. 4196, pp. 441–453, Nov. 2000.

3. Jennifer Walter, Jennifer L. Welch, and N. Vaidya, "A Mutual Exclusion Algorithm for Ad Hoc Mobile Networks," presented at 2nd International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (DIAL M), Oct. 1998. (Conference record, no proceedings.)
4. Soma Chaudhuri, Sundarajan Kanthadai, and Jennifer L. Welch, "Brief Announcement: The Role of Data-Race-Free Programs in Recoverable DSM," *Proc. 15th ACM Symposium on Principles of Distributed Computing (PODC)*, p. 245, May 1996.
5. Barbara Simons, Jennifer L. Welch, and Nancy A. Lynch, "An Overview of Clock Synchronization," (pp. 84–96) in B. Simons and A. Spector (Eds.), *Fault-Tolerant Distributed Computing*, Lecture Notes in Computer Science 448, Springer-Verlag, New York, 1990.

Grants

1. "Robust Algorithms for Vehicular Ad Hoc Networks," Texas Higher Education Coordinating Board Advanced Research Program; PI: Jennifer Welch, 2008–2010; \$149,162.
2. "Increasing the Longevity of Power-Constrained Sensor Networks," Texas Higher Education Coordinating Board Advanced Research Program; PI: Scott Pike, co-PI: Jennifer Welch; 2006–2008; \$99,100.
3. "Collaborative Research: Randomized Distributed Data Structures for Product Design," National Science Foundation; PIs: Jennifer Welch and Deborah Thurston (University of Illinois); 2005–2009; \$200,000 (TAMU portion).
4. "Increasing Computer Science Retention with Peer Teachers and Learning Modules," Texas Higher Education Coordinating Board Texas Technology Workforce Development Grant Program; PI: Valerie Taylor, co-PI: Jennifer Welch; 2004–2006; \$173,158.
5. "GAANN: Fellowships for Research in Computer Science and Computer Engineering," Department of Education; PI: Valerie Taylor, co-PIs: Donald Friesen, Jianer Chen, Jennifer Welch, and Nancy Amato; 2003–2006; \$131,184.
6. "Increasing Computer Science Retention by Developing and Deploying Self-Paced Learning Modules," Texas Higher Education Coordinating Board Texas Technology Workforce Development Grant Program; PI: Jennifer Welch, co-PI: Frank Shipman; 2002–2003; \$228,329.
7. "Programming Distributed Systems with Randomized Shared Objects," Texas Higher Education Coordinating Board Advanced Research Program; PI: Jennifer Welch; 2002–2003; \$144,000.
8. "Self-Stabilizing Group Communication for Mobile Environments," National Science Foundation; PI: Jennifer Welch, co-PI: Nancy Lynch (MIT), collaborating researcher: Shlomi Dolev (Ben-Gurion University); 2001–2004; \$280,000.
9. "Distributed Algorithms for Mobile Ad Hoc Networks," National Science Foundation; PI: Jennifer Welch, co-PI: Nitin Vaidya; 1999–2001; \$100,000.
10. "GAANN: Fellowships for Research in Robotics, Training, Mobile Computing, and High-Performance Computing," U.S. Department of Education; PI: Richard Volz, co-PIs: Louis Everett, Jennifer Welch, Nancy Amato; 1998–2001; \$605,328.
11. "CISE Research Instrumentation: Distributed Computing and Real-Time Networking Research," National Science Foundation; PI: Nitin Vaidya, co-PIs: Wei Zhao, Jennifer Welch, Nancy Amato; 1995; \$108,360.
12. "The Impact of Time on Distributed Computing," National Science Foundation Presidential Young Investigator Award; 1991–1997; \$377,000. Matching money from IBM, Dazix Corporation, Shell Oil Company Foundation, and Texas Instruments.

13. “The Impact of Time on Distributed Computing,” The University of North Carolina at Chapel Hill Junior Faculty Development Award; 1991; \$3000.
14. “Partially Synchronous Models of Distributed Systems,” IBM Faculty Development Award; 1990–1992; \$60,000.
15. “The Impact of Time on Distributed Computing,” National Science Foundation Research Initiation Award; 1990–1992; \$60,000.

Postdoctoral Scholars and Students

Postdoctoral Scholars Sponsored

1. Evelyn Pierce, 2002–2003. Self-employed.
2. Shlomi Dolev, 1992–1995. Associate Professor, Department of Computer Science, Ben-Gurion University, Israel.
3. Soma Chaudhuri, 1990–1991. Associate Professor, Department of Computer Science, Iowa State University, Ames, IA.

PhD Students

1. Srikanth Sastry, in progress.
2. Hyun-Chul Chung, in progress.
3. Saira Viqar, in progress.
4. Yu Chen, “Design and Analysis of Distributed Primitives for Mobile Ad Hoc Networks,” 2005. First position: Postdoctoral fellow, INSA, Lyons, France.
5. Guangtong Cao, “Distributed Services in Mobile Ad Hoc Networks,” 2005. First position: Sun Microsystems.
6. Hyunyoung Lee, “Randomized Memory Model and Its Applications in Distributed Computing,” 2001. First position: Assistant Professor, University of Denver, Denver, CO.
7. Jennifer E. Walter, “Distributed Algorithms for Mobile Computing Systems,” 2000. First position: Assistant Professor, Vassar College, Poughkeepsie, NY.
8. Injong Rhee (graduated from UNC), “Efficiency of Partial Synchrony, and Resource Allocation in Distributed Systems,” 1994. First position: Assistant Professor, North Carolina State University, Raleigh, NC.
9. Martha J. Kosa (graduated from UNC), “Consistency Guarantees for Concurrent Shared Objects,” 1994. First position: Assistant Professor, Department of Computer Science, Tennessee Technological University, Cookeville, TN.

Master’s Students (MS, thesis)

1. Gautam Roy, in progress.
2. Keerthi Deconda, “Fault Tolerant Pulse Synchronization,” 2008.
3. Khushboo Kanjani, “Supporting Fault-Tolerant Communication in Networks,” 2008.
4. Cheng Shao, “Multi-Writer Consistency Conditions for Shared Memory Objects”, 2007.
5. Siva Subramanian, “ Deterministic Knowledge about Nearby Nodes in a Mobile One Dimensional Wireless Environment”, 2006.
6. Nicholas Neumann, “Two Algorithms for Leader Election and Network Size Estimation in Mobile Ad Hoc Networks”, 2004.

7. Sangeeta Bhattacharya, "Randomized Location Service in Mobile Ad Hoc Networks," 2003.
8. Navneet Malpani, "Distributed Algorithms for Mobile Ad Hoc Networks," 2001.
9. Joseph Koothrappally, "CARSystem: A Distributed Algorithm for Efficient Real-Time Vehicular Traffic Control," 1997.
10. Jennifer Walter, "Hazard-Free Connection Release," 1997.
11. Jiantian Yang, "An Algorithm for Recovery of Distributed Applications with Directed Dependencies," 1996.
12. Sundarrajan Kanthadai, "Recoverable Distributed Shared Memory," 1996.
13. Julio Rivera, "Providing Ordered Message Delivery in Communication Network Systems," 1995.
14. Michael Kate, "A Competitive Analysis for Retransmission Timeout," 1994.

Master's Students (MCS, project)

1. Prasad Nagaraja, "Performance Analysis of Mutual Exclusion Algorithm for Mobile Ad Hoc Networks," 2001.
2. Saritha Goli, "Performance Analysis of Leader Election Algorithm for Mobile Ad Hoc Networks," 2001.
3. Utkarsh Dhond, "Blackboard Systems: A Medium for Communication and Collaboration," 1998.
4. Jim Tobaben, "Graphical Representations of Sorting Algorithms for Instruction," 1998.

Undergraduates

1. Rebecca Ingram, "Leader Election Algorithm for Mobile Ad Hoc Networks Tolerant of Concurrent Topology Changes," participant in CS Department's NSF Research Experience for Undergraduates program, Summer 2007.
2. Ricardo Suzuki, "Iterative Search: A Distributed Token Circulation Algorithm for MANETs" participant in CS Department's NSF Research Experience for Undergraduates program, Summer 2004.
3. Sharlita Stevenson, "Analyzing a Renaming Algorithm for Mobile Ad Hoc Networks," participant in CRA-W's Distributed Mentor Program, Summer 2004
4. Marianne Manglicmot, "Development of Web-Based Learning Module on Mobile Ad Networks", TAMU Engineering Undergraduate Summer Research Program, Summer 2003.
5. Allen Parish, directed studies on "Java Simulator for Distributed Algorithms in Mobile Ad Hoc Networks," Summer 2003.
6. Rajan Chandra, "Clock Synchronization for Mobile Ad Hoc Networks," Undergraduate Research Fellow Senior Honors Thesis, 2002–2003.
7. Sherwin Abraham, directed studies on "Trends of a Linear Equation Solving Simulator Based on Distributed Shared Memory and Randomized Algorithms," Summer 2001.
8. Sybil Calvillo, directed studies on "General Behavior of Randomized Distributed Stack," Summer 2001.
9. Rajan Chandra, "Clock Synchronization in Mobile Ad Hoc Networks," TAMU Engineering Undergraduate Summer Research Program, 2001.
10. Richard Li, directed studies on "Optimizations to Probabilistic Quorum Algorithm," Summer 2001.
11. Dustin Kirkland, "An Implementation and Analysis of a Randomized Distributed Stack," Undergraduate Research Fellow Senior Honors Thesis, 2000–2001.

12. Delayne Vaughn, directed studies on “Solving Systems of Equations Using Distributed Shared Memory Implemented with a Randomized Algorithm,” Fall 2000.
13. Kera Alexander, directed studies on “Group Communication in Mobile Ad Hoc Networks,” Summer 2000.
14. Christopher Wurtz, directed studies on “GUI for Mobile Ad Hoc Mutual Exclusion Algorithm,” Spring 2000.

Courses Developed

- Developed new two-semester course sequence for freshman computer science and computer engineering majors (CPSC 111 and 211), incorporating more software engineering concepts, including object-oriented programming using Java.
- Developed CPSC 668, Distributed Algorithms and Systems. Covers theoretical approach to distributed computer systems, especially loosely-coupled and failure-prone ones: formal models, algorithm design and analysis, lower bounds and impossibility proofs.
- Developed CPSC 689, Special Topics in Discrete Algorithms for Mobile and Wireless Networks, jointly with Prof. Nancy Lynch at MIT (6.885). Covers distributed algorithms for mobile and/or wireless ad hoc networks that can be described precisely, and that have relatively well-defined correctness, fault-tolerance, and performance requirements; aim is to understand the existing theory of such algorithms and contribute to its further development.
- At UNC: developed a new graduate advanced algorithms course on parallel and distributed algorithms, based on classic and recent research results.
- At UNC: co-developed graduate advanced distributed systems course, synthesis of concepts from systems development and theoretical results.

Courses Taught

Graduate Courses

- CPSC 603, Database Systems and Applications
- CPSC 627, Theory of Computability
- CPSC 629, Analysis of Algorithms
- CPSC 637, Complexity Theory
- CPSC 668, Distributed Algorithms and Systems
- CPSC 689, Special Topics in Discrete Algorithms for Mobile and Wireless Networks
- At UNC: Comp 212, Operating Systems
- At UNC: Comp 214, Translators
- At UNC: Comp 228, Advanced Analysis of Algorithms
- At UNC: Comp 290, Advanced Distributed Systems (co-taught)

Undergraduate Courses

- CPSC 110H, Honors Programming I
- CPSC 110, Programming I (Java)
- CPSC 120, Programming II (Data Structures in Java and C)
- CPSC 181, Introduction to Computer Science
- CPSC 211H, Honors Data Structures and Implementations,

- CPSC 289 (now numbered 111), Special Topics in Computer Science Concepts and Programming
- CPSC 289 (now numbered 222), Special Topics in Discrete Structures for Computing
- CPSC 310, Database Systems
- CPSC 311H, Honors Analysis of Algorithms
- CPSC 311, Analysis of Algorithms
- CPSC 411, Design and Analysis of Algorithms
- CPSC 433, Formal Languages and Automata
- At UNC: Comp 121, Data Structures:

Professional Activities

Editorial board member for

- *Distributed Computing*, 2008 to present.
- *Chicago Journal of Theoretical Computer Science*, 1994 to present.
- *Journal of the Chinese Institute of Engineers*, 2003 to 2005.

Guest editor for

- *Mobile Networks and Applications (MONET) Special Issue on Foundations of Mobile Computing*, 2006. Co-editor.

General chair and co-organizer for

- ACM Workshop on Principles of Mobile Computing (POMC), Aug. 2001 (held in conjunction with PODC 2001).

Program committee chair for

- DIALM-POMC Joint Workshop on Foundations of Mobile Computing, Sep. 2003 (co-chair)
- 15th International Conference on Distributed Computing (DISC), Oct. 2001
- 18th ACM Symposium on Principles of Distributed Computing (PODC), May 1999

Program committee member for

- 11th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS), Nov. 2009
- 5th International Workshop on Algorithmic Aspects of Wireless Sensor Networks (Algosensors), July 2009
- 29th International Conference on Distributed Computing Systems (ICDCS), Jun. 2009
- 27th ACM Symposium on Principles of Distributed Computing (PODC), Jul. 2008
- 28th International Conference on Distributed Computing Systems (ICDCS), Jun. 2008
- 22nd International Parallel and Distributed Processing Symposium (IPDPS), Apr. 2008
- 21st International Symposium on Distributed Computing (DISC), Sep. 2007
- DIALM-POMC Joint Workshop on Foundations of Mobile Computing, Aug. 2007
- 8th International Conference on Distributed Computing and Networking (ICDCN) (formerly IWDC), Dec. 2006
- 5th IEEE International Symposium on Network Computing and Applications (NCA), Jul. 2006
- 25th ACM Symposium on Principles of Distributed Computing (PODC), Jul. 2006

- 1st International Workshop on Foundations and Algorithms for Wireless Networking (FAWN), Mar. 2006
- 19th International Symposium on Distributed Computing (DISC), Sep. 2005
- DIALM-POMC Joint Workshop on Foundations of Mobile Computing, Sep. 2004
- 1st Workshop on Dependability Issues in Wireless Ad Hoc Networks and Sensor Networks, June 2004.
- 1st International Workshop on Algorithmic Aspects of Wireless Sensor Networks (Algosensors), July 2004
- 9th International Conference on Mobile Computing and Networking (MobiCom), Sep. 2003
- International Parallel and Distributed Processing Symposium (IPDPS), Apr. 2003
- 14th International Symposium on Distributed Computing (DISC), Oct. 2000
- 3rd International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (DIAL M), Aug. 1999
- 16th ACM Symposium on Principles of Distributed Computing (PODC), Aug. 1997
- 17th International Conference on Distributed Computing Systems (ICDCS) – vice chair, May 1997
- 13th ACM Symposium on Principles of Distributed Computing (PODC), Aug. 1994
- 7th International Workshop on Distributed Algorithms (WDAG), Sep. 1993
- 13th International Conference on Distributed Computing Systems (ICDCS), May 1993
- 6th International Workshop on Distributed Algorithms (WDAG), Nov. 1992
- IEEE Conference on Communication Software: Communications for Distributed Applications and Systems, Apr. 1991

Reviewer for National Science Foundation, *Journal of the ACM*, *ACM Transactions on Computer Systems*, *ACM Transactions on Programming Languages and Systems*, *ACM/IEEE Transactions on Networking*, *IEEE Transactions on Computers*, *IEEE Transactions on Parallel and Distributed Systems*, *IEEE Transactions on Software Engineering*, *Information and Computation*, *Distributed Computing*, *Journal of Parallel and Distributed Computing*, *Information Processing Letters*, National Science Foundation, Israel Basic Research Foundation, etc.

Significant University, College and Department Service

- TAMU Faculty Senate, member, elected, June 2000 to May 2003.
- TAMU Women’s Faculty Network, steering committee member, elected, July 1998 to June 2001; steering committee president, elected, July 1999 to June 2000.
- External member of Civil Engineering Department Head Search Committee, 2002–2004.
- Member of College of Engineering Tenure and Promotion Advisory Committee, 2006–2008.
- Various departmental committees, member. Chair of Undergraduate Curriculum (1999–2001, 2005–2007), Promotion and Tenure (2006–2008), Faculty Search (2003–2004), Web Advisory (2002–2004), Colloquium (1998–1999).

Outreach

- Co-PI on NSF Research Experience for Teachers award, teachers spent 4 weeks on campus working in research labs and developing projects and lesson plans for their own students, summer 2007 and summer 2008.

- Participated in Women's Leadership Workshop, organized by Aggie Women in Computer Science (AWICS), Apr. 2006.
- Judge for College of Engineering Undergraduate Summer Research Grants program poster presentations, Aug. 2005.
- Participated in panels for College of Engineering's Undergraduate Summer Research Grants program on life as a faculty member, July 2004, and on tips for faculty mentors, May 2004.
- Participated in College of Engineering's graduate invitational program for prospective graduate students, November 2003.
- Participated in panel on college life for TAMU engineering freshmen women, September 2003.
- Panel member for Women in Engineering Conference, TAMU, Nov. 2002.
- Presentation for prospective computer science graduate students at TAMU College of Engineering Graduate Fall Invitational, Nov. 2002.
- Presentation on tips for success at College Night Out for Engineering to new freshmen with scholarships, Oct. 2002.
- Building and research lab tour to high school students and parents as part of Society of Women Engineers' program, Feb. 2001.
- Presentation for SHIP, Summer Honors Invitational Program (TAMU Office of Honors Programs and Academic Scholarships), May 2000.
- Presentation for CREW, Clusters of Resident Engineering Women (TAMU residence hall clustering program), Apr. 2000.
- Presentation on majoring in Computer Science and Computer Engineering at the Society of Women Engineers' conference for high school students, Feb. 1998.
- Presentations on "Algorithms and Computers" to middle school and high school girls in June 1995 as part of the Society of Women Engineers summer camp at TAMU.

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