

David E. Bakken

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Education

Ph.D., Computer Science (minor: Arabic), The University of Arizona, 1994.

M.S., Computer Science, The University of Arizona, 1990.

B.S., Computer Science (minor: Electrical Engineering), Washington State University, 1985.

B.S., Mathematics, Washington State University, 1985.

Cadet, US Military Academy, West Point, NY, 1979-81. (Honorable medical discharge for Army Wrestling injury.)

Professional Experience

Assistant Professor & Associate Professor, School of EECS, WSU, June 1999 to present.

Visiting Professor, University of Oslo, Norway, AY2004-5

Visiting Professor, Simula Research Lab, Norway, AY2004-5

Scientist, Distributed Systems Department, BBN Technologies, July 1994 to June, 1999.

- PI for AQuA Project in DARPA ITO Quorum program, adding replication mechanisms and policies to the QuO framework. 8/96 through 8/99.
- Co-Lead architect for the Quality Objects (QuO) framework, adding quality of service mechanisms and policies to distributed object frameworks. 7/94 to 6/99.
- Lead technical consultant to BBN Planet (now Genuity) ISP services on how to add replication and caching support to their new global fiber network, 7/98 to 6/99.

Instructor, Boston University Metropolitan College, Fall 1995.

Software Engineer, Boeing, Seattle, WA, June 1985 to July 1988.

- Initiated, designed, and developed the *DataFlow* suite of tools to help parallelize legacy flight simulation programs. Called a “major tool” in 2001, still in use as of at least 2006.
- Worked on debugging monitor for real-time executive for 7J7 airplane program until cancelled.
- Taught Ada, Unix, and C courses to Boeing employees.

Consulting and Board Membership

Principal Distributed Systems Architect, TriGeo Network Security Inc., January 2001 to June 2003.

Member, Board of Directors, TriGeo Network Security, 2001-2002.

Principal, [Bakken Middleware Associates](#), Sep. 2000 to present. Consulted to

- Amazon.com, on fault tolerance and scalability
- Network Associates Inc. Labs (formerly Trusted Information Systems), on DARPA/ISO survivability research on replicated CORBA middleware that will tolerate intrusions and other “Byzantine” behavior (such as security breaches). See our paper in the DSN-2002 conference paper (McDonnell et al) below.

Professional Recognition

- Co-author of paper receiving Best Paper Award, [21st International Conference on Distributed Computing Systems](#) (the premiere international conference in distributed computing), IEEE, 2001. Best paper among 217 submissions from 17 countries.
- Young Faculty Recognition Award, WSU College of Engineering and Architecture Convocation, 2002.

Grants and Donations

Academic Research

D. Bakken and C. Hauser. "Regional Deployment of GridStat", Dept. of Energy (via PNNL), \$200K, August 2007 to August 2008.

C. Hauser, D. Bakken, and A. Bose. "Trustworthy Cyber Infrastructure for the Power Grid", National Science Foundation (Center Scale Award), \$985,000, August 2005 – August 2010. Budget control: Hauser 33%, Bakken 33%, Bose 33%.

D. Bakken, travel grant for working on EU proposals, Faculty of Mathematical and Natural Science, University of Oslo, 2005, \$2050 (13,000 Kroner), Budget control: Bakken 100%.

C. Hauser, D. Bakken, and A. Bose. "International Collaboration on Critical Infrastructure Protection", National Science Foundation (Supplement to \$211K grant), June 2004 to July 2005, \$30,000. Budget control Bakken: 100%.

C. Hauser, D. Bakken, and A. Bose. "Transatlantic Critical Infrastructure Protection (CIP): Surveying EU Investments in SCADA-related topics", National Science Foundation (Supplement to \$211K grant), April 2005 to August 2006, \$21,057. Budget control: Bakken: 100%.

T. Plagemann, V. Goebel, C. Griwodz, P. Halvorsen, D. Bakken. "Ad-Hoc InfoWare: Middleware: Extension for Sabbatical Support for Professor D. Bakken" Norwegian Research Council, 2003, \$41,100 (approx.; 280,000 Kroner) in AY04-05, \$14,700 (approx.; 100,000 Kroner) in followup year. Budget control: Bakken 100%.

C. Hauser, D. Bakken, and A. Bose. "Secure and Robust IT Architectures to Improve the Survivability of the Power Grid", National Science Foundation, August 2003 to August 2005, \$211,822. Collaboration with Carnegie Mellon University. Budget control Hauser: 60%, Bakken: 40% , Bose: 0%.

D. Bakken and D. Blough: "The Obfuscation Virtual Machine: An Embeddable, Programmable, and Managed Software Module Providing Computation Precision Security", Air Force Research Laboratory, September 2002 to September 2004, \$438,189, subcontract to Georgia Institute of Technology (Prof. Douglas Blough, PI). Budget control (salary, RAs, equipment, etc.): Bakken 72%, Blough 28%. (Only \$360,000 was authorized of the \$438,189 originally awarded due to budget cuts at AFRL.)

D. Bakken and A. Bose. "Industrial Applications of Information Security to Protect the Electric Power Infrastructure", subcontract from Schweitzer Engineering Labs (co-PI Anjan Bose), in NIST Critical Infrastructure Protection program, \$248,000, October 2001 to May 2003. Budget control (salary, RAs, equipment, etc.): Bakken 91%, Bose 9% (from the proposal budget; Bose gave Bakken 100% control after the fact; he did not need salary from this).

D. Bakken. "Floating Point Voting Middleware Technology Transfer", \$14,500, DARPA, subcontract from Network Associates Inc. on the ITDOS project (Byzantine-fault-tolerant CORBA), August 2001.

D. Bakken. "Voting Virtual Machine Extensions and Enhancements", \$52,184, DARPA, subcontract from Network Associates Inc. on the ITDOS project (Byzantine-fault-tolerant CORBA), February 2002.

D. Bakken and K. Sivalingam. "Configurable and Composable Systems Mechanisms Supporting Multi-Property Quality of Service for Memory and Power Constrained Embedded Systems", \$100,000, NSF, subcontract to co-PI, Krishna Sivalingam for power awareness aspect of project. Budget Control (salary, RAs, equipment, etc.): Bakken 82%, Sivalingam 18%.

Industry Donations

D. Bakken and C. Hauser. Cisco research donation, \$80,000; July 2003, for MicroQoS CORBA middleware research and development. (Co-PI: Prof. Hauser. Bakken budget control: \$67,500).

D. Bakken. Cisco research donation, \$69,000; June 2002, for MicroQoS CORBA middleware research and development.

D. Bakken. Microsoft, software donation for advanced distributed systems research and instruction, \$777; Feb 2002.

Intel equipment grant, \$18,593; Dec. 2001. For advanced distributed systems research and instruction.

D. Bakken. HP Labs distributed systems research donation, Fall 2000, \$12,000.

D. Bakken. Microsoft curriculum development grant, \$4200, June 2000. For advanced distributed systems instruction.

D. Bakken and K. Sivalingam. HP Equipment grant, June 2000, \$236,000, for distributed systems and networking courses. Budget control: Bakken 50%, Sivalingam 50%.

K. Sivalingam and D. Bakken. Intel equipment grant, \$22,598, 2000, for networking and distributed computing instruction. Budget control: Sivalingam 50% Bakken 50%.

Research Grants while in Industry

D. Bakken, R. Schantz, W. Sanders, and K. Birman. "Adaptive Quality of Service for Availability" (AQuA), 8/96 to 8/99 (at BBN), sponsored by DARPA/ITO, \$2,665,856 (originally \$1,968,712; augmented in 1998). CO-PIs Schantz (BBN); Bill Sanders (U. Illinois at Urbana-Champaign, circa 30%); Ken Birman (Cornell U, circa 10%).

D. Bakken and D. Frincke. "Adaptive and Hierarchical Manager Modules for Managed Security Administration", 7/01-9/01 (at TriGeo Network Security Inc.), sponsored by Spokane Intercollegiate Research & Technology Institute (SIRTI), \$100,000. Budget control: Bakken 50%, Frincke 50%.

Publications

Refereed Journal Papers

1. K. Harald Gjermundrød, David E. Bakken, Carl H. Hauser, and Anjan Bose. "GridStat: A Flexible QoS-Managed Data Dissemination Framework for the Power Grid", *IEEE Transactions on Power Delivery*, to appear in 2008 (accepted November 2007).
2. Hauser, Carl H., Bakken, David E., Dionysiou, Ioanna, Gjermundrød, K. Harald, Irava, Venkata, Helkey, Joel and Bose, Anjan. "Security, trust and QoS in next-generation control and communication for large power systems," *International Journal of Critical Infrastructures*, Inderscience, to appear, 2008.
3. Drugan, O., Dionysiou, I., Bakken, D., Plagemann, T., Hauser, C., and Frincke, D. "On the Importance of Composability of Ad Hoc Mobile Middleware and Trust Management", *Lecture Notes in Computer Science 3694*, Springer, 2005.
4. K. Tomsovic, D. Bakken, M. Venkatasubramanian, A. Bose. "Designing the Next Generation of Real-Time Control, Communication and Computations for Large Power Systems", *Proceedings of the IEEE (Special Issue on Energy Infrastructure Systems)*, 93(5), May, 2005.
5. A. David McKinnon, David E. Bakken, and John C. Shovic. "A Configurable Cryptography Subsystem in a Middleware Framework for Embedded Systems", *Computer Networks*, Elsevier, 46:6, 20 December 2004, 771–195.
6. Ren, Y., Bakken, D., Courtney, T., Cukier, M., Karr, D., Rubel, P. and Sabnis, C., Sanders. W. and Schantz, R. and Seri, M., "AQuA: An Adaptive Architecture that Provides Dependable Distributed Objects", *IEEE Transactions on Computers*, 52:1, January 2003, 31–50.
7. Schantz, R., and Zinky, J. and Megquier, J. and Loyall, J. and Karr, D. and Bakken, D. "An Object-Level Gateway Supporting Quality of Service". *International Journal of Computer Systems Science & Engineering*, 16:2, March 2001, 145–155.
8. Zinky, John A. and Bakken, David E. and Schantz, Richard E., "Architectural Support for Quality of Service for CORBA Objects", *Theory and Practice of Object Systems* (Special Issue on CORBA and the OMG), 3:1, April 1997, 55–73.
9. Bakken, David E. and Schlichting, Richard D., "Supporting Fault-Tolerant Parallel Programming in Linda," *IEEE Transactions on Parallel and Distributed Systems*, 6 (3), March 1995, 287–302.

Magazine Articles

10. Carl Hauser, David Bakken, and Anjan Bose. "A Failure to Communicate: Next-Generation Communication Requirements, Technologies, and Architecture for the Electric Power Grid", *IEEE Power and Energy*, 3(2), March/April, 2005, 47–55.
11. David E. Bakken, Rupa Parameswaran, Douglas M. Blough, Ty J. Palmer, and Andy A. Franz. "Data Obfuscation: A New Class of Security Mechanism Providing Anonymity and Desensitization of Useable Data Sets", *IEEE Security and Privacy*, 2:6, November/December 2004, 34–41.

Invited Conference Papers

12. D. Bakken, O. Drugan, I. Dionysiou, T. Plagemann, D. Frincke, and C. Hauser. "Composability of Ad Hoc Mobile Middleware and Trust Management for Critical Infrastructures", in *Proceedings of the International Service Availability Symposium*, Service Availability Forum, Berlin, Germany, April 25-26, 2005.
13. Schantz, R., Zinky, J., Karr, D., Bakken, D., Megquier, J. "An Object Gateway Supporting Integrated Property Distributed Quality of Service", (Invited Paper), *Proceedings of the Second IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 99)*, May 2-5, 1999, Saint-Malo, France.

Refereed , Competitive Conference and Workshop Papers

14. E. Næss, D.A. Frincke, A.D. McKinnon, and D.E. Bakken. "Configurable Middleware-Level Intrusion Detection for Embedded Systems". To appear in International Workshop on Security in Distributed Computing Systems (SDCS-2005) in conjunction with ICDCS-2005.
 - Acceptance Rate: 29% of 42 submissions.

15. A. David McKinnon, Kevin E. Dorow, Tarana R. Damania, Olav Haugan, Wesley E. Lawrence, David E. Bakken, John C. Shovic. "A Configurable Middleware Framework with Multiple Quality of Service Properties for Small Embedded Systems", 2nd IEEE International Symposium on Network Computing and Applications, Cambridge, MA April 16-18, 2003, 197–204.
 - Acceptance Rate: 26% of 155 submissions
16. McDonnell, D and Neibuhr, B. and Matt, B. and Sames, D. and Tally, Gregg and Wang, S. and Whitmore, B and Bakken, D. "Developing a Heterogenous Intrusion-Tolerant CORBA System" (regular full-length research paper), in *Proceedings of the International Conference on Dependable Systems and Networks (DSN-2002)*, IEEE/IFIP, Washington, DC, June 2002, 239–248.
 - Acceptance Rate: 31% of 156 submissions
17. Franz, A. and Mista, R. and Bakken, D. and Dyreson, C. and Medidi, M. "Mr. Fusion: A Programmable Data Fusion Middleware Subsystem with a Tunable Statistical Profiling Service" (Software Demonstration paper), in *Proceedings of the International Conference on Dependable Systems and Networks (DSN-2002)*, IEEE/IFIP, Washington, DC, June 2002, 273–278.
 - Acceptance Rate: 31% of 156 submissions
18. Bakken, D. and Zhan, Z. and Jones, C. and Karr, D. "Middleware Support for Voting and Data Fusion", in *Proceedings of the International Conference on Dependable Systems and Networks (DSN-2001)*, IEEE/IFIP, Göteborg, Sweden, July 1-4, 2001, 453-462.
 - Acceptance Rate: 35% of 153 submissions.
19. Krishnaswamy, V. and Ahamad, M. and Raynal, M. and Bakken, D. "Shared State Consistency for Time-Sensitive Distributed Applications", in *Proceedings of the Twenty First International Conference on Distributed Computing Systems (ICDCS-21)*, IEEE, Tempe, Arizona, April, 2001. Also reprinted as sole article in *Newsletter of the Technical Committee on Distributed Processing*, IEEE Computer Society, Fall 2001.
 - Acceptance Rate: 32% of 217 submissions (from 19 countries).
 - **HONOR: Best Paper Award**
20. Ren, J. and Cukier, M. and Rubel, P. and Sanders, W.H. and Bakken, D.E. and Karr, D.A., Building Dependable Distributed Applications Using AQuA, In *Proceedings of the 4th IEEE Symposium on High Assurance Systems Engineering (HASE'99)*, Washington DC, November 17-19, 1999, 189-196.
 - Acceptance Rate: 61% of 44 submissions
21. Zinky, J. and O'Brien, L. and Bakken, D. and Krishnaswamy, V. and Ahamad, M. "PASS: A Service for Efficient Large Scale Dissemination of Time Varying Data Using CORBA", in *Proceedings of the Nineteenth International Conference on Distributed Computing Systems (ICDCS-1999)*, IEEE, Austin, TX, May 31 – June 5, 1999, 496-506.
 - Acceptance Rate: not published (very likely similar to other ICDCSs, in 15%-35% range).
22. Sabnis, Chetan and Cukier, Michel and Ren, Jennifer and Rubel, Paul and Sanders, William H. and Bakken, David E. and Karr, David A. "Proteus: A Flexible Infrastructure to Implement Adaptive Fault Tolerance in AQuA," in *Preprints of the Seventh IFIP International Working Conference on Dependable Computing for Critical Applications (DCCA-7)*, IFIP, San Jose, CA, Jan. 6-8, 1999, 137-156
 - Acceptance Rate: 32% of 62 submissions from 16 countries.
23. Vanegas, Rodrigo and Zinky, John A. and Karr, David A. and Loyall, Joseph P. and Schantz, Richard E. and Bakken, David E. "QuO's Runtime Support for Quality of Service in Distributed Objects", in *Proceedings of the IFIP International Conference on Distributed Systems Platforms and Open Distributed Processing (Middleware '98)*, IFIP, England, September 1998, 207-223.
 - Acceptance Rate: 19% of 150 submissions.
24. Cukier, Michel and Ren, Jennifer and Sabnis, Chetan and Henke, David and Pistole, Jessica, and Sanders, William, and Bakken, David and Berman, Mark and Karr, David and Schantz, Richard, "AQuA: An Adaptive Architecture That Provides Dependable Distributed Objects", in *Proceedings of the Seventeenth Symposium on Reliable Distributed Systems (SRDS-17)*, IEEE, October 1998, 245-253.

- Acceptance Rate: 34% of 110 submissions
25. Loyall, Joseph P. and Schantz, Richard E. and Zinky, John A. and Bakken, David E. “Specifying and Measuring Quality of Service in Distributed Object Systems,” in *Proceedings of the First IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 98)*, April 1998, Kyoto Japan, 223-243.
 - Acceptance Rate: 50% of submissions
 26. Bakken, David E. and Schlichting, Richard D., “Tolerating Failures in the Bag-of-Tasks Programming Paradigm,” *Proceedings of the Twenty-First International Symposium on Fault-Tolerant Computing (FTCS-21)*, IEEE, Montreal, Quebec, June 25-27, 1991, pp. 248-255.
 - Acceptance Rate: 28% of 218 submissions.

Other Workshop and Conference Papers (lightly refereed, acceptance rates over 50%)

27. Ioanna Dionysiou, Dehorah Frincke, Carl Hauser, and Dave Bakken, “An Approach to Trust Management Challenges for Critical Infrastructures”, in *Proceedings of the 2nd International Workshop on Critical Information Infrastructures Security (CRITIS07)*, Malaga, Spain, October 2-5, 2007, to appear in Lecture Notes in Computer Science Series, Springer Berlin, 2007
28. Carl H. Hauser, David E. Bakken, Ioanna Dionysiou, K. Harald Gjermundrød, Venkata S. Irava and Anjan Bose, Security, trust, and QoS in next-generation control and communication for large power systems, in *Proceedings of the Workshop on Complex Network and Infrastructure Protection (CNIP06)*, Rome 28-29 March, 2006.
29. Johnston, Ryan A., Hauser, Carl H., Gjermundrød, K. Harald, and Bakken, David E., “Distributing Time-synchronous Phasor Measurement Data Using the GridStat Communication Infrastructure,” in *Proceedings of 39th Annual Hawaii International Conference on System Sciences (CD-ROM)*, January 4-7, Computer Society Press, 2006. 8 pages.
30. Kevin Dorow and David Bakken, “Flexible Fault Tolerance In Configurable Middleware For Embedded Systems”, in *Proceedings of the Workshop on Architectures for Complex Application Integration (WACAI2003)*, part of the 27th Annual International Computer Science Software and Applications Conference (COMPSAC 2003), IEEE, Dallas, Texas, November 3–6, 2003.
31. Bakken, D, Bose, A., Dyreson, C., Bhowmik, S, Dionysiou, I., Gjermundrod, H. and Xu, L. “Impediments to Survivability of the Electric Power Grid and Some Collaborative EE-CS Research Issues to Solve Them”, In *Proceedings of the Fourth Information Survivability Workshop*, IEEE, Vancouver, Canada, March 2002, p. C-2—C-5.
32. Bakken, D., Evje, T., and Bose, A. “Survivable Status Dissemination in the Electric Power Grid”, in *Proceedings of the Information/System Survivability Workshop*, in *Supplement Proceedings of the International Conference on Dependable Systems and Networks (DSN-2001)* IEEE/IFIP, Göteborg, Sweden, July 2001.
33. Bakken, D. and Bose, A. and Bhowmik, S. “Survivability and Status Dissemination in Combined Electric Power and Computer Communications Networks”, in *Proceedings of the Third Information Survivability Workshop (ISW-2000)*, CERT, October, 2000, Boston, MA.
34. Schantz, Richard E. and Bakken, David E. “Distributed Objects with Quality of Service: An Organizing Architecture for Integrated System Properties,” *Proceedings of the Third International Workshop on Object-Oriented, Real-Time, Dependable Systems (WORDS 97)*, IEEE, February, 1997.

Book Chapters

35. Sabnis, Chetan and Cukier, Michel and Ren, Jennifer and Sanders, William W. and Bakken, David E. and Karr, David A. “Proteus: A Flexible Infrastructure to Implement Adaptive Fault Tolerance in Aqua,” *Dependable Computing for Critical Applications 7*, IEEE Computer Society Press, 1999, C. Weinstock and J. Rushby (eds.), 149-168.
36. Loyall, Joseph P, and Bakken, David E. and Schantz, Richard E. and Zinky, John A. and Karr, David A. and Vanegas, Rodrigo, “QoS Aspect Languages and their Runtime Interactions”, in “Languages, Compilers, and Run-Time Systems for Scalable Computers”, O’Hallaron, David (ed.), *Lecture Notes in Computer Science 1511*, Springer-Verlag, 1998.
37. Zinky, John A. and Bakken, David E, “Managing Systemic Meta-Data for Creating QoS-Adaptive CORBA

Applications”, *Building QoS into Distributed Systems*, Andrew Campbell and Klara Nahrstedt, ed, Chapman & Hall, 1997. (Adapted from IWQoS ’97 proceedings paper)

38. Bakken, David E. “On Specification, Metadata, and Binding of Multi-Property Quality of Service,” *Dependable Computing for Critical Applications 6*, IEEE Computer Society Press, 1998, Mario Dal Cin, Catherine Meadows, and William H. Sanders (eds.), 149-152.
39. Schlichting, Richard D. and Bakken, David E. and Thomas, Vicraj T., “Language Support for Fault-Tolerant Parallel and Distributed Programming,” in *Foundations of Ultradependable Computing: Paradigms for Dependable Applications*, (G. Koob, C. Lau, Eds.) Kluwer Academic Publishers, 1994, 55-78.

Other Publications (including other workshops and conferences)

40. Ioanna Dionysiou, Deborah Frincke, David E. Bakken and Carl Hauser. “Actor-Oriented Trust”, Technical Report EECS-GS-006, Washington State University, 2006.
41. Carl A. Gunter, William H. Sanders, David E. Bakken, Anjan Bose, Roy Campbell, George Gross, Carl H. Hauser, Himanshu Khurana, Ravishankar K. Iyer, Zbigniew T. Kalbarczyk, Klara Nahrstedt, David M. Nicol, Thomas J. Overbye, Peter W. Sauer, Sean W. Smith, Robert J. Thomas, Von Welch, and Marianne Winslett, “Trustworthy Cyber-Infrastructure for Power (TCIP),” Proceedings of the Workshop on Research Directions for Security and Networking in Critical Real-time and Embedded Systems, San Jose, CA, April 2006. Proceedings online at <http://moss.csc.ncsu.edu/~mueller/crtes06/>.
42. E. Næss, D.A. Frincke, A.D. McKinnon, and D.E. Bakken. “Configurable Middleware-Level Intrusion Detection for Embedded Systems”. Technical Report MQC-2005-01, School of Electrical Engineering and Computer Science, Washington State University, January 2005.
43. Andy Franz, David Bakken, and Murali Medidi. “Multidimensional Fusion in Middleware”, *Supplement of the International Conference on Dependable Systems and Networks (DSN-2002)*, IEEE/IFIP, San Francisco, CA, June 2003, B-58–B-59.
44. K. Harald Gjermundrød, Ioanna Dionysiou, David Bakken, Carl Hauser, and Anjan Bose. “Flexible and Robust Status Dissemination for the Electric Power Grid”. *Technical Report EECS-GS-003*, Washington State University, September 2003.
45. Harald Gjermundrød, Ioanna Dionysiou, David Bakken, and Carl Hauser. “Fault Tolerance Mechanisms in Status Dissemination Middleware”, *Supplement of the International Conference on Dependable Systems and Networks (DSN-2002)*, IEEE/IFIP, San Francisco, CA, June 2003, B-56–B-57.
46. Douglas Smathers, Laney Kidd, Steven Goldsmith, Laurence Phillips, David Bakken, Anjan Bose, and David McKinnon. “Software Requirements Specification for Management for Grid Control”, SAND REPORT SAND2003-1215, Sandia National Laboratories, April 2003, 82 pages.
47. Bakken, D. “Middleware: What it is, and How it Enables Adaptivity and Dependability”, in *Proceedings of the IFIP 10.4 Working Group on Dependable Computing, 43rd Meeting*, International Federation for Information Processing (IFIP), Santa Maria, Cape Verde, January 4–7, 2003, 13–40
48. Bakken, D. “GridStat: Middleware for More Extensible and Resilient Status Dissemination for the Electric Power Grid” (Research Report), in *Proceedings of the IFIP 10.4 Working Group on Dependable Computing, 43rd Meeting*, International Federation for Information Processing (IFIP), Santa Maria, Cape Verde, January 4–7, 2003, 345–356.
49. Bakken, D, Bose, A., Hauser, C., Dionysiou, I., Gjermundrød, H., Xu, L, and Bhowmik, S. “Towards More Extensible and Resilient Real-Time Information Dissemination for the Electric Power Grid”, in *Proceedings of Power Systems and Communications Systems for the Future*, International Institute for Critical Infrastructures, Beijing, September 2002. Available via <http://gridstat.eecs.wsu.edu>.
50. McKinnon, A. David and Damania, Tarana R. and Bakken, David E. and Dorow, Kevin E. and Lawrence, Wesley E.; “MicroQoS CORBA: A QoS-Enabled, Reflective, and Configurable Middleware Framework for Embedded Systems”; Proceedings of the OMG Real-Time & Embedded Distributed Object Systems Workshop, OMG & DARPA, Arlington, VA, USA, July 15-18, 2002.
51. McKinnon, A. David and Dorow, Kevin E. and Damania, Tarana R. and Bakken, David E. and Lawrence, Wesley E.; “MicroQoS CORBA: A Fault Tolerant and Configurable Middleware Framework for Embedded Systems”; Proceedings of the 2nd Workshop on The ACE ORB (TAO), Arlington, VA, USA, July 19, 2002.

52. Dionysiou, I., Gjermundrød, H., and Bakken, D. "Fault Tolerance Issues in Publish-Subscribe Status Dissemination Middleware for the Electric Power Grid", *Supplement of the International Conference on Dependable Systems and Networks (DSN-2002)*, IEEE/IFIP, Washington, DC, June 23-26, 2002, B-62-63.
53. Bakken, D., Ding, J., Gu, L. and Sivalingam, K. "Towards Bandwidth Reservation for Reliable Multicast", in *Proceedings of the IFIP 10.4 Working Group on Dependable Computing, 40th Meeting*, International Federation for Information Processing (IFIP), Stenungsund, Sweden, July 4-8, 2001, 241-248.
54. Parameswaran, R., Blough, D., and Bakken, D. "A Preliminary Investigation of Precision vs. Fault Tolerance Trade-offs in Voting Algorithms", in *Digest of FastAbstracts presented at the International Conference on Dependable Systems and Networks (DSN-2001)*, IEEE/IFIP, Göteborg, Sweden, July 4-8, 2001.
55. Bakken, D., Gu, L. Sivalingam, K., and Karr., D. "Improving Group Communication Performance with Bandwidth Reservation", in *Digest of FastAbstracts presented at the International Conference on Dependable Systems and Networks (DSN-2000)*, IEEE/IFIP, New York, June, 2000.
56. Bakken, D., Bjune, G., and Ahamad, M. "Towards Hybrid Replication and Caching Strategies", in *Digest of FastAbstracts presented at the International Conference on Dependable Systems and Networks (DSN-2000)*, IEEE/IFIP, New York, June, 2000.
57. Krishnaswamy, Vijaykumar and Ahamad, Mustaque and Raynal, Michel and Bakken, David. "Shared state consistency for distributed time-sensitive applications". Technical Report GIT-CC-00-15, College of Computing, Georgia Institute of Technology, April 2000.
58. Bakken, D and Berman, M, and Cukier, M. and Karr, D. and Megquier, J, and Ren, J. and Ruebel, P. and Sabnis, C. Sanders, W. and Schantz, R. *AQuA Dependability Management User's and Programmer's Guide Release 2.1*, University of Illinois and BBN Technologies, October 1999.
59. Bakken, David E. and Karr, David A and Jones, Christopher C. and Hale, John C, "The Voting Virtual Machine: A Flexible Mechanism for Collating Replicated Client Requests and Server Replies", *Digest of FastAbstracts presented at the 29th Annual International Symposium on Fault-Tolerant Computing (FTCS-29)*, FTCS-29, IEEE, June 15-18, 1999, Madison, WI.
60. Cukier, Michel and Ren, Jennifer and Rubel, Paul and Bakken, David and Karr, David, "Building Dependable Distributed Objects with the AQuA Architecture",. *Digest of FastAbstracts presented at the 29th Annual International Symposium on Fault-Tolerant Computing (FTCS-29)*, FTCS-29, IEEE, June 15-18, 1999, Madison, WI, p 17-18.
61. Schantz, Richard and Bakken, David and Karr, David and Loyall, Joseph and Zinky, John. "Distributed Objects with Quality of Service: An Organizing Architecture for Integrated System Properties", Workshop on Compositional Software Architectures, DARPA/OMG/MCC, January 6-8, 1998.
62. Zinky, John A. and Bakken, David E, "Managing Systemic Meta-Data for Creating QoS-Adaptive CORBA Applications", *Proceedings of the Fifth International Workshop on Quality of Service (IWQoS '97)*, Columbia University, New York, USA, May 1997.
63. Bakken, David E. "On Specification, Metadata, and Binding of Multi-Property Quality of Service," Position Paper, *Proceedings of the Sixth International Working Conference on Dependable Computing for Critical Applications (DCCA-6)*, IFIP, Grainau, Germany, March 1997.
64. Bakken, David E. "Object-Oriented QoS for C2 Adaptivity and Evolvability, *DARPA Workshop on Security Technology for Next-Generation C2 Systems*, Institute for Defense Analyses, Alexandria, VA, July 29-30, 1996.
65. Bakken, David E. and Schantz, Richard E. and Zinky, John A. "QoS Issues for Wide-Area CORBA-Based Object Systems", *Proceedings of the Second International Workshop on Object-Oriented, Real-Time, Dependable Systems (WORDS 96)*, IEEE, February, 1996.
66. Bakken, David. E. and Schlichting, Richard D., "Using FT-Linda for Constructing Fault-Tolerant Parallel Programs", *The Journal of the University of Kuwait (Science)*, special issue on Parallel and Distributed Computing, 1996.
67. Zinky, John. A, Bakken, David E., and Schantz, Richard. "Overview of Quality of Service for Distributed Objects", *Proceedings of the Fifth Dual Use Applications and Technologies Conference*, IEEE, Utica, NY, May 22-25, 1995, 510-515.

68. Guedes, D. Bakken, D., Bhatti, N., Hiltunen, M. and Schlichting, R. "A Customized Communications Subsystem for FT-Linda", *Proceedings of the 13th Brazilian Symposium on Computer Networks*, May 1995, 319-338.
69. Bakken, David. E. and Schlichting, Richard D., "Using FT-Linda for Constructing Fault-Tolerant Parallel Programs" (extended abstract), in *Proceedings of the Conference on Parallel and Distributed Computing*, Kuwait, March 13-15, 1995, 29-31.
70. Zinky, John and Bakken, David and Schantz, Richard. "Overview of Quality of Service for Distributed Objects", BBN Systems and Technologies Technical Report, 1995.
71. Bakken, David E., *Supporting Fault-Tolerant Parallel Programming in Linda*. Ph.D thesis, Department of Computer Science, The University of Arizona, 1994. Available as TR 94-23 from the Dept. of Computer Sci., The University of Arizona.
72. Townsend, Gregg and Bakken, Dave. "Porting MultiSR". In *Porting the SR Programming Language*. Department of Computer Science, The University of Arizona, 1994. From the SR distribution <http://www.cs.arizona.edu/sr/>. Tells how to port the SR runtime system that I parallelized to different parallel computers.
73. Bakken, David E. and Schlichting, Richard E.. *Supporting Fault-Tolerant Parallel Programming in Linda*. Technical Report TR93-18, The University of Arizona, 1993.
74. Bakken, David E., "Inter-Partition Data Integrity in the Asynchronous DATAC Environment," in *Proceedings of the Eighth Digital Avionics Systems Conference*, AIAA/IEEE, San Jose, Calif., October 17-20, 1988, pp. 724-730.

Journal Papers in Review

Other Papers In Review

Patents

- J. Zinky, R. Schantz, D. Bakken, and J. Loyall. "Framework for Providing Quality of Service Requirements in a Distributed Object-Oriented Computer System", U.S. Patent Number 6,691,148, February 10, 2004.
- J. Zinky, R. Schantz, D. Bakken, and J. Loyall. "Framework for Providing Quality of Service Requirements in a Distributed Object-Oriented Computer System", U.S. Patent Number 6,629,126, September 30, 2003.
- J. Zinky, R. Schantz, D. Bakken, J. Loyall, and R. Vanegas. "Framework for Providing Quality of Service Requirements in a Distributed Object-Oriented Computer System", U.S. Patent Number 6,480,879. November 1, 2002.

Former Graduate Student Advisees

1. Rick Grandy, MS (CS) 2007, Application of Reliable Host-Based Multicast to Large Scale Simulations. Working at Lockheed Martin, Richland Washington.
2. Erlend Viddal, MS (CS), 2007, Ratatoskr: Wide-Area Actuator RPC over GridStat with Timeliness, Redundancy and Safety. Now working for Eltek Valere, Drammen Norway.
3. Stian Abelsen, MS (CS) 2007, Adaptive GridStat Information Flow Mechanisms and Management for Power Grid Contingencies. Now working for Simula Innovation, Oslo Norway.
4. Ioanna Dionysiou PhD (CS) 2006, Dynamic and Composable Trust Management for Publish-Subscribe systems. Assistant Professor at University of Nicosia, Cyprus.
5. Kjell “Harald” Gjermundrød PhD (CS) 2006 , GridStat status dissemination middleware mechanisms. Research scientist at the University of Cyprus in Nicosia.
6. Thor Egil Skaug, MicroQoSCORBA MS (CS) 2004, wireless middleware adaptation mechanisms in Bluetooth. Working in industry
7. Eivind Næss, MicroQoSCORBA MS (CS) 2004, configurable middleware-layer embedded intrusion detection subsystem.
8. Wesley Lawrence, MicroQoSCORBA realtime profiling toolkit, MS (CS) October 2003. Now working at [Pacific Northwest National Laboratory \(PNNL\)](#).
9. [A. David McKinnon](#) (PhD in CS), 2003, MicroQoSCORBA architecture & security mechanisms, now working at [Pacific Northwest National Laboratory \(PNNL\)](#).
10. Kevin Dorow, MS (CS), 2002, MicroQoSCORBA fault tolerance, now working at [Pacific Northwest National Laboratory \(PNNL\)](#).
11. [Tarana Damania](#) MS (EE), MicroQoSCORBA, 2002. Completed an MBA at WSU in 2004, now working for Ernst & Young in the Los Angeles area.
12. Radek Mista MS(CS), Mr. Fusion (Fusion Status Service), 2002, then worked for [Silicon Defense](#).
13. Sripriya Vasudevan MS (CS), 2001, ad hoc mobile protocols, now at [Microsoft](#) (co-advisor Prof. Sivalingam)
14. Solve Stokkan, MS (CS), 2001, adaptive attribute-based security for CORBA, now at [TriGeo Network Security](#)
15. Zhiyuan (“Troy”) Zhan, MS (CS), 2001, Voting Virtual Machine, now at Georgia Tech
16. [Olav Haugan](#), MS (CS) 2001, MicroQoSCORBA Toolkit, now working for [Hynomics](#).
17. Marius Sundbakken, MS (CS) 2001, C++ Maintainability (co-advisor Jack Hagemester)
18. Limin Gu, MS (CS), 2000, group communication and bandwidth reservation, now at [Silicon Graphics](#)
19. [Chris Jones](#), MS (CS), 2000, voting in middleware, first at [BBN](#), then at [TriGeo Network Security](#).

Former Graduate Committee Members

PhD: Venkata Irava, Lin Xu (EE power), Xiaofeng Yu (EE power), Byung-Hoon Park, Nilesh Bhide.

MS: Erik Solum, : Hao Jin, Vaishali Chattopadhyay, Ryan Johnston, Supreeth Sheshadri, Balvinder Thind, Ping Jiang, Knut Helge-Vik, Ramkumar Rajendran, Bedirhan Urgun, Cheng Li, Subalakshmi Venugopal, Sunil Gowda, Harini Krishnamurthy, Vikas Singh (MME), Jin Ding, Hui-Ling Lin, Raghava Kashyapa, Bo Wen, Wen Wei, Weiyun Huang, Ramakrishna Shenai, Kjell Harald Gjermundrød, Geir Bjune, Hongmei Sun, Ashraf Sultan (MME). Also I think 5–10 others whose names I forgot to write down.

Current Graduate Student Advisees

1. Wendy Maiden, trust and security policies for the electric power grid (part time, works at Pacific Northwest National Lab).
2. Leif Carlsen (part-time, works at Pacific Northwest National Lab)

Current Graduate Committee Members

Teaching Experience

WSU CptS/EE 562, “Fault Tolerant Computing”, Spring 2008.

WSU CptS 224, “Programming Tools”, Fall 2007

WSU CptS 464 and 564, “Distributed Systems Concepts and Programming, Fall 2007.

WSU CptS 500, “Proseminsr”, Fall 2007.

WSU CptS 224, “Programming Tools”, Fall 2006

WSU CptS 464 and 564, “Distributed Systems Concepts and Programming, Fall 2006.

WSU CptS 500, “Proseminar”, Fall 2006.

WSU CptS/EE 562, “Fault Tolerant Computing”, Spring 2006.

WSU CptS 224, “Programming Tools”, Fall 2005

WSU CptS 464 and 564, “Distributed Systems Concepts and Programming, Fall 2005.

WSU CptS 500, “Proseminar”, Fall 2005.

WSU CptS 224, “Programming Tools”, Spring 2004

WSU CptS/EE 562, “Fault Tolerant Computing”, Spring 2004.

WSU CptS 464 and 564, “Distributed Systems Concepts and Programming, Fall 2003.

WSU CptS/EE 562, “Fault Tolerant Computing”, Spring 2002.

WSU CptS 464 and 564, “Distributed Systems Concepts and Programming, Fall 2001. Taught circa 40 students, with a lot of CORBA programming experience involved.

WSU CptS/EE 455, “Introduction to Networking”, Spring 2001.

WSU CptS 464 and 564, “Distributed Systems”, Fall 2000. Taught 26 students, with a lot of CORBA programming experience involved. These are two new classes I added and got approved.

WSU CptS/EE 562, “Fault Tolerant Computing”, Spring 2000.

WSU CptS 565, “Distributed Systems”, Fall 1999. Taught 27 students, with a lot of CORBA programming experience involved.

Instructor, “Architecture and Design of Client/Server Systems”, BU MET CS 679, Boston University (Metropolitan College), Fall, 1995.

Teaching Assistant, Introduction to Computer Science (first semester CS course; ??CS 115), University of Arizona, Spring 1990. Included leading a weekly lecture.

Teaching Assistant, Department of Computer Science, Washington State University, Fall 1984. Graded papers for CS 450, Design and Analysis of Algorithms. Only such undergraduate to my knowledge with grading authority in our dept. over any graduate students (a few took this class).

University Service

Member, Mathematics Faculty Search Committee, 2007-2008

Chair of Mentoring Committee (Prof Roger Alexander), 2006

Chair of Mentoring Committee (Prof. Murali Medidi), 2006

Faculty Search Committee (Computer Science), 2005-2006

Chair of Tenure Committee (Prof. Zhe Dang), 2005-2006

Member of Mentoring Committee (Prof. Carl Hauser, Prof. Sirisha Medidi, Prof. Min-Sik Kim), 2006

EECS Director Search Committee Member, 2003-2004.

Curriculum Committee Member (Computer Science), 2000-2002

Faculty Search Chair (Computer Science), 2000-2001.

Professional Activities

External Doctoral Committees

Zhiyuan Zhan, “Meeting Data Sharing Needs of Heterogeneous Distributed Users”, College of Computer Science, Georgia Institute of Technology, December, 2006. Voting member of committee.

Kristina Forsberg, “Design Principles of Fly-By-Wire Architectures”, Department of Computer Engineering, Chalmers University of Technology, Göteborg, Sweden, June, 2003. “Opponent” in the dissertation defense (formal inquisitor and voting member of committee).

Vijaykumar Krishnaswamy, “Shared State Management for Time Sensitive Distributed Applications” College of Computer Science, Georgia Institute of Technology, February 2001. Voting member of committee.

Peter A. Dinda, “Resource Signal Prediction and its Application to Real-Time Scheduling Advisors”, School of Computer Science, Carnegie Mellon University, February, 2000. Voting member of committee.

Panel Participation

Panelist for panel “Critical Computing Systems: Challenges and Directions”, Fourth International Conference on Configurable Distributed Systems (CDS '98), Annapolis, MD, May 4-6, 1998.

Moderator of panel “Extending QoS to include Performance, Dependability, and Security”, Sixth International Working Conference on Dependable Computing for Critical Applications (DCCA-6), Grainau, Germany, March 5-7, 1997.

Panelist for panel “Major Research Issues in Object-Oriented Reliable Distributed Systems”, Second International Workshop on Object-Oriented Real-Time Dependable Systems (WORDS '96), IEEE, February 1996.

Session Chairs

Chair of Session TBD, International Conference on Dependable Systems and Networks (DSN-2008), IEEE/IFIP, Anchorage, Alaska, June 2008.

Chair of the Session 6B “Fast Abstracts III” at the International Conference on Dependable Systems and Networks (DSN-2002), IEEE/IFIP, San Francisco, CA, June 2003.

Chair of the session “Fast Abstracts I” at the International Conference on Dependable Systems and Networks (DSN-2002), IEEE/IFIP, Washington, DC, June 2002.

Chair of the session “Object Oriented Systems” at the Twenty First International Conference on Distributed Computing Systems (ICDCS-21), IEEE, Mesa, Arizona, April 2001.

Chair of one of the FastAbstracts sessions at the [International Conference on Dependable Systems and Networks](#), (DSN-2000), IEEE/IFIP, New York, June 2000.

Chair of the “Broadcast and Multicast” session at the Nineteenth International Conference on Distributed Computing Systems (ICDCS '99), IEEE, Austin, Texas, May 31-June 4, 1999.

Program and Organizing Committees

Program Committee Member for Seventh IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS 2007), Paphos, Cyprus, June 6-8, 2007.

Program Committee Member for the [4th International Service Availability Symposium \(ISAS 2007\)](#), Durham, New Hampshire, May 21–22, 2007.

Program Committee Member for 2nd Workshop on Hot Topics in Dependability ([HotDep 06](#)), part of the 7th Symposium on Operating Systems Design and Implemental ([OSDI 06](#)), USENIX, November 8, 2006, Seattle.

Program Committee Member for 6th IFIP WG 6.1 International Conference on Distributed Applications and Interoperable Systems (DAIS 2006), Bologna, Italy, June 13-16, 2006

Program Committee Member for [High Assurance Systems Engineering \(HASE 2005\)](#), Heidelberg, Germany, October 12-14, 2005.

Program committee for the FastAbstracts sessions of [International Conference on Dependable Systems and Networks](#) (DSN-2005), Yokohama, Japan, June 28-July 1, 2005.

Program Committee Member for [International Workshop on Critical Information Infrastructures \(CIIW'05\)](#), International Institute for Critical Infrastructures, Linköping, Sweden, May 17-18, 2005.

Program Committee Member for [2nd International Service Availability Symposium](#), Berlin, Germany, April 25-26, 2005.

Program Committee Member for 3rd IEEE International Symposium on Network Computing and Applications, Cambridge, MA, August 30-September 1, 2004.

Program Committee Member for the [International Workshop on Middleware Performance \(MP 2004\)](#), satellite workshop for the [IEEE International Performance, Computing, and Communications Conference](#), Phoenix, Arizona US April 2004.

Program Committee Member for the [2004 Pacific Rim International Symposium on Dependable Computing \(PRDC 2004\)](#), IEEE, French Polynesian Islands (Tahiti), March 3–5, 2004.

Program Committee Member for [Workshop on Reliable and Secure Middleware](#), part of [Fifth International Symposium on Distributed Objects and Applications \(DOA'03\)](#), Sicily, Italy, Nov. 3–7, 2003.

Program Committee Member for the Workshop on Architectures for Complex Application Integration (WACAI 2003), part of the [27th Annual International Computer Software and Applications Conference \(COMPSAC 2003\)](#), Hong Kong, Sept. 30 – Oct. 3, 2003.

Program Committee Member for Tutorials Committee, [International Conference on Dependable Systems and Networks \(DSN-2003\)](#), San Francisco, CA, June 2003.

Program Committee member, [2002 International Symposium on Distributed Computing \(DISC-2002\)](#), Toulouse, France, October 28-30, 2002.

[Program committee member for Fourth International Symposium on Distributed Objects & Applications \(DOA'02\)](#), Irvine, California, October 28-November 1, 2002.

Program committee member for Twenty Second International Conference on Distributed Computing Systems (ICDCS-22), Vienna, Austria, July 2-5 2002.

Member of Organizing Committee for International Conference on Dependable Systems and Networks (DSN-2002), Washington, DC, June 2002.

FastAbstracts chair for International Conference on Dependable Systems and Networks (DSN-2002), Washington, DC, June 2002.

Program committee member for Workshop on Dependable Middleware-Based Systems (WDMS-2002), Washington, DC, June 2002.

Program committee member for the Sixth Annual Workshop on Distributed Objects and Components Security (DOCSEC2002), Object Management Group, March 18-21 2002, Baltimore, Maryland.

Program committee member for Third International Symposium on Distributed Objects & Applications, Rome, September 2001.

Program committee for the [FastAbstracts](#) sessions of [International Conference on Dependable Systems and Networks \(DSN-2001\)](#), Göteborg, Sweden, July 2001.

Program committee member for Twenty First International Conference on Distributed Computing Systems (ICDCS-21), IEEE, Mesa, Arizona, April 2001.

Program committee member for the FastAbstracts sessions of [International Conference on Dependable Systems and Networks](#), (DSN-2000), IEEE/IFIP, New York, June 2000.

Program committee member for Nineteenth International Conference on Distributed Computing Systems (ICDCS '99), IEEE, Austin, Texas, May 31-June 4, 1999.

Program committee member for Fourth Workshop on Languages, Compilers, and Run-time Systems for Scalable Computers (LCR '98), ACM SIGPLAN, Pittsburgh, PA, May 28-30, 1998.

Other Professional Activities

Chair, Data Bus Subcommittee, RFP Task force of the North American Synchrophasor Initiative ([NASPI](#)), 2007-8.

Invited reviewer for *Building Secure and Reliable Network Applications* by Kenneth P. Birman, Manning Publications

(Greenwich, CT) and Prentice Hall, 1997.

Referee for Theory and Practice of Object Systems, Information Processing Letters, Journal of Parallel and Distributed Computing, IEEE Software, IEEE Network, Theoretical Computer Science (Special Issue on Dependable Parallel Computing), IEEE Symposium on Fault-Tolerant Computing (multiple years), 2nd International Symposium on Reliable and Object-Oriented Distributed Systems (ISORC99), 13th European Conference on Object-Oriented Programming (ECOOP99), First International Conference on Mobile Data Access, and Dependable Computing for Critical Applications, DSN-2001, IEEE Transactions on Parallel and Distributed Systems (multiple years), IEEE Transactions on Software Engineering, Research Council of Norway, DSN-2003, DSN-2004, DSN-2007.

Member IEEE, ACM.

**Invited Technical Presentations (not presenting conference or workshop paper)
(pending in italics)**

10/15/08 *College of Computing, Georgia Institute of Technology, Atlanta, GA*
10/14/08 *School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA*
5/20/08 *Midwest Independent Transmission System Operator (MISO), Camel, IN*
4/30/08 *Puget Sound Energy, Bellevue WA*
4/30/08 *Areva, Redmond, WA*
3/27/08 *Western Electricity Coordinating Council (Data Exchange Work Group), San Diego, CA*
2/5/08 *Bonneville Power Administration, Vancouver WA*
11/7/07 *Tennessee Valley Authority, Chattanooga, TN*
11/6/07 *Oak Ridge National Lab, Oak Ridge, TN*
11/2/07 *Idaho National Lab, Idaho Falls, ID*
9/18/07 *Workshop on Phasors & Phasor Applications, Entergy utility, New Orleans, Louisiana*
9/13/07 *Pacific Northwest National Lab, Richland WA*
3/15/07 *Electric League of the Pacific Northwest, Bellevue Washington*
2/26/07 *Intercollege, Nicosia, Cyprus*
2/22/07 *Oslo College, Norway*
2/21/07 *Buskerud College, Kongsberg Norway*
2/19/07 *Sintef Energy Research, Trondheim Norway.*
1/12/07 *IFIP 10.4 Working Group on Dependable Computing, Gosier, France*
1/14/07 *IFIP 10.4 Working Group on Dependable Computing, Gosier, France*
11/28/06 *National Institute of Standards and Technology, Washington DC*
11/27/06 *Department of Energy, Washington DC*
11/14/06 *Idaho National Lab, Idaho Falls, ID*
10/11/06 *Avista Utilities, Spokane, Washington*
10/5/06 *Visualization & Analytics Centers (VAC) Consortium meeting, PNNL, Richland, WA*
6/8/06 *Technische Universität Darmstadt, Germany*
6/5/06 *Workshop on Complex Networks and Infrastructure Protection, Italian National Energy Lab (ENEA), Rome, Italy*
3/17/06 *US-EU Critical Infrastructure Protection workshop, Washington, DC*
3/16/06 *Department of Homeland Security, Washington, DC*
10/13/05 *Eastern Interconnect Phasor Project (EIPP) meeting, Washington, DC. Note: EIPP later was expanded to what is now known as the North American Synchrophasor Initiative (NASPI), www.naspi.org.*
5/30/05 *Workshop on Next-Generation Power Grid Communications for Better Control and Protection, Rome, Italy*
4/25/05 *Lancaster University, UK*
4/22/05 *Lancaster University, UK*
3/7/05 *Department of Energy, Washington, DC*
2/4/05 *EC Workshop on power grid communications, Brussels, Belgium (keynote speaker)*
11/18/04 *Linköping University, Sweden*
10/21/04 *Norsk EnergiRevisjon AS (NERAS), Lie, Norway*
10/11/04 *Technische Universität Wien, Vienna, Austria*
10/8/04 *Technische Universität Darmstadt, Germany*
10/6/04 *ABB Research, Baden, Switzerland*
9/27/04 *European Commission, Brussels Belgium*
9/20/04 *Department of Homeland Security, Washington DC*
5/6/04 *Pacific Northwest National Lab, Richland WA*
4/7/04 *Boeing Commercial Airplanes, Seattle, WA*

3/24/04 Inland Northwest Homeland Defense Research Symposium, Moscow, ID
 3/2/04 Department of Energy, Washington, DC
 3/2/04 Department of Homeland Security, Washington, DC
 2/10/04 Simula Research Laboratory, Olso, Norway
 12/15/03 Pacific Northwest National Lab, Richland WA
 11/12/03 Software Protection Initiative Workshop, Washington DC
 10/27/03 Agilent Technologies, Liberty Lake, Washington
 9/26/03 Oregon Graduate Institute, Portland, OR
 6/12/03 Technische Universität Berlin, Germany
 6/11/03 Chalmers University, Göteborg Sweden
 6/5/03 University of Oslo, Oslo Norway
 4/18/03 BBN Systems and Technologies, Cambridge, MA
 4/14/03 Georgia Institute of Technology, Atlanta, GA
 4/4/03 Cisco, San Jose, CA
 4/4/03 HP Labs, Palo Alto, CA
 2/12/03 Amazon.com, Seattle, WA
 2/11/03 INTEC Security Forum, Spokane, WA
 1/10/03 RED ELÉCTRICA DE ESPAÑA, Madrid, Spain.
 1/7/03 43rd IFIP Working Group 10.4 on Dependable Computing (research report on GridStat), Sal, Cape Verde.
 1/4/03 43rd IFIP Working Group 10.4 on Dependable Computing (opening presentation on middleware for adaptability and dependability), Sal, Cape Verde.
 12/5/02 Pacific Northwest National Lab (PNNL), Richland, Washington.
 9/4/02 Northwest Public Power Association (NWPPA), Spokane, Washington.
 6/18/02 The Boeing Company, Seattle, Washington.
 4/25/02 University of Tromsø, Tromsø, Norway
 4/23/02 University of Oslo, Oslo, Norway
 4/22/02 Simula Research Laboratory, Olso, Norway
 3/13/02 DARPA OASIS PI Meeting, Hilton Head, SC.
 3/5/02 HP Labs, Palo Alto, CA.
 12/6/01 World Wide Packets, Spokane WA.
 8/3/01 CERT Coordination Center, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, PA.
 7/08/01 IFIP 10.4 Working Group on Dependable Computing and Formal Methods (Research Reports briefing), Stenungsund, Sweden.
 6/27/01 University of Oslo, Oslo Norway
 6/21/01 Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland
 5/27/01 Middleware Summit, Washington University, St. Louis, MO.
 2/20/01 Georgia Institute of Technology, Atlanta GA
 1/31/01 Oregon State University, Corvallis OR
 10/12/00 Arizona State University, Tempe, AZ
 10/11/00 University of Arizona, Tucson, AZ
 7/24/00 DARPA Realtime Java VM Workshop, Arlington, VA
 11/16/99 Washington University, St. Louis, MO
 11/15/99 University of Illinois at Urbana-Champaign
 4/21/99 Hewlett Packard Laboratories, Palo Alto, CA
 12/2/97 USAF Rome Lab/C3AB 20th Technology Exchange Meeting, Utica, NY
 11/21/97 Carnegie Mellon University, Pittsburgh PA
 11/5/97 Northeastern University, Boston MA
 10/29/97 Oregon Graduate Institute, Beaverton, OR
 10/28/97 University of Oregon, Eugene, OR
 10/27/97 Boeing Defense and Space Group, Kent, WA
 10/24/97 Washington State University, Pullman, WA
 10/23/97 Boeing Commercial Airplane Company, Everett WA

10/10/97 Georgia Institute of Technology, Atlanta, GA
6/17/97 OOPSLA Mid-Year Applied Object Technology Telecommunications Workshop, Port Jefferson NY
12/11/96 DARPA QoS Meeting (at 37th IETF Meeting), San Jose, CA
12/5/96 Rome Lab/C3AB 19th Technology Exchange Meeting, Utica, NY
3/14/95 Conference on Parallel and Distributed Systems, Kuwait University
2/8/95 University of Massachusetts, Lowell
7/12/94 Boeing Commercial Airplane Company, Everett, WA
5/1994 University of Texas, El Paso (date approx.)
4/1994 University of Wyoming (date approx.)
4/1994 BBN Systems and Technologies, Cambridge, Mass. (date approx.)
7/1992 GTE Labs, Waltham, MA

Other Technical Presentations (for a published conference or workshop)

4/26/05 2nd International Service Availability Symposium (ISAS05), Berlin, Germany.
6/25/02 International Conference on Dependable Systems and Networks (DSN-02), Washington, DC.
7/04/01 International Conference on Dependable Systems and Networks (DSN-01), Göteborg, Sweden. (2 presentations: full paper and also Fast Abstract)
10/24/00 Third Information Survivability Workshop (ISW-2000), Boston, MA
6/25/97 FTCS-27 (Work In Progress Report), Seattle, WA
6/17/97 OOPSLA Mid-Year Applied Object Technology Telecommunications Workshop, Port Jefferson NY
3/14/95 Conference on Parallel and Distributed Systems, Kuwait University
6/26/91 FTCS-21, Montreal, Canada
10/18/88 Digital Avionics Systems Conference, San Jose, CA.