

Curriculum Vitae

Philip K. McKinley

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Biographical Sketch

Philip K. McKinley received the PhD degree from the University of Illinois, where his thesis advisor was Professor Jane Liu. His dissertation addressed protocols for supporting multimedia group communication. In 1990, he joined the faculty at Michigan State University as an Assistant Professor. He was promoted to Associate Professor in 1996 and to Professor in 2002. Prior to his academic career, he was a member of technical staff at AT&T Bell Laboratories.

In 1996, Dr. McKinley co-founded the Software Engineering and Network Systems Laboratory. The SENS Laboratory currently includes six faculty members and approximately 30 graduate research assistants. Dr. McKinley has been a PI or co-PI on projects funded by the National Science Foundation, the Office of Naval Research, the Army Research Office, the Department of Energy, and industrial partners; he has published over 140 papers in refereed journals and conferences. His current research interests include high-assurance software, self-adaptive software, evolutionary computation, artificial life, and computational biology. Dr. McKinley is the Principal Investigator on the ARO-funded *AWARE* project, which addresses the design of adaptive self-monitoring software for protecting critical infrastructure from software component failures and cyber attack. Dr. McKinley is also affiliated with MSU's Digital Evolution Laboratory and MSU's graduate program in Ecology, Evolutionary Biology, and Behavior. In two current NSF projects, *Orchid* and *TEAMS*, McKinley and his colleagues are studying the application of evolutionary computation to the design of high-assurance software and robust behaviors in swarm robotics, respectively. In addition, he is applying artificial life (evolving computer programs) to help understand and predict the evolution of complex behaviors (e.g., quorum sensing, biofilm formation, antibiotic resistance) in bacteria.

Dr. McKinley teaches courses in distributed computing, computer networks and operating systems. In 1997, he was awarded the Withrow Award for Teaching Excellence. He is active in providing service to the professional community, and has served on numerous review panels and program committees. He was program co-chair of the 2003 IEEE International Conference on Distributed Computing Systems (ICDCS) and has served as an Associate Editor for *IEEE Transactions on Parallel and Distributed Systems*.

Education

- 1989 Ph.D., Computer Science, University of Illinois at Urbana-Champaign, Urbana, Illinois.
Dissertation: *Group Communication in Bus-Based Computer Networks*
Doctoral Advisor: Prof. Jane W. S. Liu
- 1983 M.S., Computer Science, Purdue University, West Lafayette, Indiana.
- 1982 B.S., Mathematics and Computer Science, Iowa State University, Ames, Iowa.

Professional Experience

- **Professor** (2002 - present)
Department of Computer Science and Engineering, Michigan State University, E. Lansing, Michigan.
- **Associate Professor** (1996 - 2002)
Department of Computer Science and Engineering, Michigan State University, E. Lansing, Michigan.
- **Assistant Professor** (1990 - 1996)
Department of Computer Science and Engineering, Michigan State University, E. Lansing, Michigan.
- **Member of Technical Staff** (1982 - 1990)
AT&T Bell Laboratories, Naperville, Illinois. (on educational leave of absence 1985-1989)
- **Graduate Fellow** (1987 - 1989)
Department of Computer Science, University of Illinois, Urbana, Illinois.
- **Graduate Research Assistant** (1986 - 1987)
Department of Computer Science, University of Illinois, Urbana, Illinois.
- **Graduate Teaching Assistant**(1985 - 1986)
Department of Computer Science, University of Illinois, Urbana, Illinois.

Grants and Contracts

- National Science Foundation, Computing Systems Research Program
Title: TEAMS: Transplanting Artificial Life Behaviors to Mobile Robots
PI: **P. McKinley**
Amount: \$494,364
Duration: 2009 - 2012.
- Army Research Office
Title: AWARE: Adaptive Software Monitoring and Dynamic Reconfiguration for Critical Infrastructure Protection
PI: **P. McKinley**; Co-PI: B. Cheng
Amount: \$315,000
Duration: 2008 - 2011.
- National Science Foundation, Computing Research Infrastructure Program
Title: A Testbed for Evolving Adaptive and Cooperative Behavior Among Autonomous Systems
PI: **P. McKinley**; Co-PIs: B. Cheng, C. Ofria, R. Pennock and X. Tan
Amount: \$188,110
Duration: 2008 - 2010.
- National Science Foundation, Software for Real-World Systems Program
Title: ORCHID: Harnessing Digital Evolution to Design High-Assurance Adaptive Systems
PI: B. Cheng; Co-PIs: **P. McKinley**, C. Ofria, and X. Tan
Amount: \$600,000
Duration: 2008 - 8/2011.

- National Science Foundation, Small Grants for Exploratory Research Program
 Title: Applying Digital Evolution to Behavioral Models
 PI: B. Cheng; Co-PIs: **P. McKinley**, C. Ofria, and R. Lenski
 Amount: \$100,000
 Duration: 9/2007 - 8/2008.
- National Science Foundation, IUCRC Program
 Title: Planning grant: Center for Software-Intensive Ultra-Large-Scale Systems
 PI: B. Cheng; Co-PIs: S. Biswas, C. Ofria, **P. McKinley**, and L. Dillon
 Amount: \$10,000
 Duration: 1/2007 - 12/2007.
- Michigan State University, Quality Funds Program
 Title: High-Assurance Systems Initiative
 PIs: **B. Cheng and P. McKinley** Co-PIs: S. Gage, B. Pentland, C. Radcliffe, X. Tan, S. Biswas,
 S. Kulkarni, L. Dillon, R. Stirewalt
 Amount: \$370,000 (plus \$427,815 in matching from departments and colleges)
 Duration: 2006-2008.
- Office of Naval Research, Critical Infrastructure Protection Program
 Title: RAPIDware: Component-Based Development of Adaptive and Dependable Middleware
 PI: **P. McKinley** Co-PIs: R. Stirewalt, B. Cheng, L. Dillon, S. Kulkarni
 Amount: \$3,135,609
 Duration: 2001-2007.
- National Science Foundation, ITR Program
 Title: ITR: Supporting Adaptable Pervasive Computing through a Kernel-Middleware eXchange
 PI: **P. McKinley**
 Amount: \$210,000
 Duration: 2003-2006.
- National Science Foundation, CISE/EIA Experimental Partnerships Program
 Title: Meridian: An Integrated Toolkit for Developing Interactive Distributed Applications
 PI: B. Cheng Co-PIs: L. Dillon, **P. McKinley**, R. Stirewalt
 Amount: \$1,934,076
 Duration: 2000-2007.
- National Science Foundation, CISE/EIA
 Title: A Proxy-Centric Testbed for Mobile Internet Research
 PI: **P. McKinley** Co-PIs: S. Kulkarni, B. Cheng, R. Stirewalt, J. Lee, L. Dillon
 Amount: \$96,360 plus \$50,000 MSU matching
 Duration: 2001-2004.
- National Science Foundation, CISE/CCR
 Title: Host-Level Protocol Support for Interoperable Distributed Computing
 PI: **P. McKinley**
 Amount: \$199,904
 Duration: 2000-2004.
- National Science Foundation, CISE/NCR
 Title: LSR-Based Group Communication in ATM Networks
 PI: **P. McKinley**

Amount: \$214,945
Duration: 1997-2000.

- National Science Foundation, CISE/CDA
Title: CISE Research Instrumentation for an SMP Cluster Testbed
PI: **P. McKinley** Co-PIs: B. Cheng, A. Jain
Amount: \$125,200 plus \$65,000 MSU matching
Duration: 1997-1998.
- National Science Foundation, CISE/CDA
Title: CISE Research Instrumentation for ATM Networking
PI: H. Hughes Co-PIs: **P. McKinley**, M. Mutka
Amount: \$169,068 plus \$94,000 MSU matching
Duration: 1996-1997.
- National Science Foundation, CISE/CCR
Title: Collective Communication in Wormhole-Routed Massively Parallel Computers
PI: **P. McKinley**
Amount: \$208,200
Duration: 1995-1998.
- Manufacturing Research Consortium
Title: Environmental Information and Decision Support System for Secure Access
to Distributed Multimedia Data
PI: B. Cheng Co-PI: **P. McKinley**
Amount: \$42,360
Duration: 1995-1996.
- National Science Foundation, EHR/DUE
Title: Cooperative Multimedia Computing Laboratory
PI: **P. McKinley** Co-PIs: B. Cheng, J. Weng
Amount: \$94,610 plus \$100,000 MSU matching
Duration: 1995-1997.
- AT&T Foundation
Title: Enhancements to High-Speed Network and Performance Laboratory
PI: H. Hughes Co-PIs: **P. McKinley**, M. Mutka, A. Wojcik
Amount: \$50,000
Duration: 1994-1995.
- U.S. Department of Energy
Title: A Scalable Communications Library for Distributed-Memory Computing Environments
PI: **P. McKinley** Co-PI: L. Ni
Amount: \$294,918
Duration: 1993-1996.
- AT&T Foundation
Title: Enhancements to High-Speed Network and Performance Research Laboratory
PI: H. Hughes Co-PIs: **P. McKinley**, M. Mutka, A. Wojcik
Amount: \$25,000
Duration: 1993-1994.

- National Science Foundation, CISE/CDA
 Title: Equipment Proposal for High Speed Local Area Networks
 PI: H. Hughes Co-PIs: **P. McKinley**, M. Mutka, A. Esfahanian
 Amount: \$100,000 plus \$45,851 MSU matching
 Duration: 1993-1994.
- National Science Foundation, CISE/MIPS
 Title: Multicast Communication in Multicomputers
 PI: L. M. Ni Co-PIs: **P. McKinley**, A. Esfahanian
 Amount: \$331,914
 Duration: 1992-1996.
 First REU Supplement (**McKinley**, Ni, Esfahanian), 1993-1994, \$13,000.
 Second REU Supplement (**McKinley**, Ni, Esfahanian), 1994-1995, \$13,000.
- National Science Foundation, CISE/CDA
 Title: Equipment Proposal for Wormhole-Routed Multicomputer
 PI: L. Ni Co-PIs: **P. McKinley**, M. Mutka, and R. Enbody
 Amount: \$77,000 plus \$45,890 MSU matching
 Duration: 1992-1993.
- AT&T Foundation
 Title: Development of Computer Performance Evaluation and Computer Network Laboratory
 PI: H. Hughes Co-PIs: **P. McKinley**, M. Mutka, A. Wojcik
 Amount: \$25,000
 Duration: 1992-1993.
- Ameritech Corporation
 Title: Multicast Communication in High-Speed Optical Networks
 PI: **P. McKinley**
 Amount: \$30,000
 Duration: 1991-1993.
- Michigan State University (AURIG Program)
 Title: Architectures and Protocols for High-Speed Networks
 PI: **P. McKinley**
 Amount: \$7,607
 Duration: 1991.

Other Awards and Honors

- Best Paper nomination for “Evolution of Robust Data Distribution Among Digital Organisms,” by D. B. Knoester, A. Ramirez, P. K. McKinley and Betty H.C. Cheng, *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2009)*, Montreal, Canada, July, 2009.
- Best Paper Award for “Applying Genetic Algorithms to Decision Making in Autonomic Computing Systems,” by A. Ramirez, D. B. Knoester, B. H. C. Cheng and P. K. McKinley, *Proceedings of the 6th IEEE International Conference on Autonomic Computing and Communications*, Barcelona, Spain, June 2009.

- Best Paper Award for “Digital Evolution of Behavioral Models for Autonomic Systems,” by H. J. Goldsby, B. H.C. Cheng, P. K. McKinley, D. B. Knoester, and C. A. Ofria, *Proceedings of the Fifth IEEE International Conference on Autonomic Computing*, Chicago, Illinois, June 2008.
- Best Paper recognition for “TA-LTL: Specifying Adaptation Timing Properties in Autonomic Systems,” by Z. Zhou, J. Zhang, P. K. McKinley and B. H. C. Cheng, *Proceedings of the Third IEEE Workshop on Engineering of Autonomic and Autonomous Systems (EASe 2006)*, Columbia, Maryland, April 2006. Selected as one of the best papers, invited for journal publication.
- Best Student Paper Award for “On Quality-of-Service and Energy Consumption Tradeoffs in FEC-Enabled Audio Streaming,” by Z. Zhou, P. K. McKinley and S. M. Sadjadi. *Proceedings of the Twelfth IEEE International Workshop on Quality of Service (IWQoS)*, Montreal, Canada, June 2004. This paper was selected as the best paper whose primary author is a student, from 30 papers accepted for the workshop and 154 total submissions.
- Best Paper Award nomination for “A Thread-Based Interface for Collective Communication on ATM Networks,” by C. C. Huang, Y. Huang and P. K. McKinley, *Proceedings of the 1995 IEEE International Conference on Distributed Computing Systems*, Vancouver, Canada, May 1995. (At most one paper nominated from each conference track.)
- Best Paper Award for “Multicast Tree Construction in Bus-Based Networks,” by P. K. McKinley and J. W. S. Liu, *Proceedings of the 1989 Phoenix Conference on Computers and Communications*, Phoenix, Arizona, 1989.
- Withrow Award for Teaching Excellence (selected by students), College of Engineering, Michigan State University, 1997.
- Ameritech Faculty Fellowship, 1991-1993.
- U.S. Army Graduate Fellowship, 1987-1989.
- Phi Beta Kappa.

Multidisciplinary Activities and Laboratory Development

- *Faculty member*, MSU Ecology, Evolutionary Biology, and Behavior Program, a multidisciplinary graduate program emphasizing the interdisciplinary nature of these fields and other biological sciences such as genetics, developmental and molecular biology.
- *Co-founder* of MSU’s High-Assurance Systems Initiative to develop new educational programs, foster interdisciplinary research, and enhance outreach linkages to local industry and state government.
- *Co-PI*, NSF I/UCRC Center on Ultra-Large-Scale Software Intensive Systems (U. Virginia, UC San Diego, MSU, Vanderbilt). The center will focus on research problems of industrial importance in the context of complex software-intensive systems across multiple application domains. Planning grant funded, full proposal in progress.
- *Co-founder*, Software Engineering and Network Systems Laboratory. Established in 1996 for research in software engineering, computer networking, formal methods, parallel and distributed computing. The SENS Laboratory has grown to include four additional faculty members (L. Dillon, K. Stirewalt, S. Kulkarni, and J. Shapiro) and presently supports approximately 30 graduate research assistants.

Current research grants involving SENS faculty total approximately \$10M (\$7M to SENS investigators and \$3M external collaborators). Laboratory equipment has been supported by two NSF/CISE instrumentation grants, MSU matching funds, the NSF Meridian grant, and the ONR RAPIDware grant.

- *Co-founder*, Multimedia Computing Laboratory. Established in 1995 for undergraduate instruction, with support from NSF ILI Grant and matching funds from Michigan State University.
- *Co-founder*, High-Speed Networking and Performance Laboratory, Established in 1993 for research in computer networking, with support from an NSF CISE Instrumentation Grant, AT&T, and matching funds from Michigan State University.

Publications

Monographs

- *Fault Covering Problems in Reconfigurable VLSI Systems*, (with R. Libeskind-Hadas, N. Hasan, J. Cong, and C. L. Liu), Kluwer Academic Publishers, Norwell, Massachusetts, 1992.

Chapters in Books

- S. M. Sadjadi and P. K. McKinley, "Transparent Autonomization in Composite Systems," in *Autonomic Computing: Concepts, Infrastructure, and Applications*, edited by M. Parashar and S. Hariri, CRC Press, 2006.
- J. Zhang, B.H.C. Cheng, Z. Yang, and P.K. McKinley, "Enabling Safe Dynamic Component-Based Software Adaptation," in *Architecting Dependable Systems*, Springer Lecture Notes for Computer Science, Springer-Verlag, 2005, pp. 194-211.

Refereed Journal and Magazine Articles

- S. M. Sadjadi and P. K. McKinley, "Transparent autonomization of CORBA," *Computer Networks*, vol. 53, no. 10, pp. 1570-1586, 2009.
- P. K. McKinley, B. H.C. Cheng, C. Ofria, D. Knoester, B. Beckmann and H. Goldsby, "Harnessing Digital Evolution," *IEEE Computer*, vol. 41, no. 1, pp. 54-63, January 2008.
- F. A. Samimi, P. K. McKinley, S. M. Sadjadi, C. Tang, J. K. Shapiro and Z. Zhou, "Service Clouds: Distributed Infrastructure for Adaptive Communication Services," *IEEE Transactions on Network and Service Management*, vol. 4, no. 2, pp. 84-95, September 2007.
- C. Tang and P. K. McKinley, "Topology-aware overlay path probing," *Computer Communications* vol. 30, issue 9, pp. 1994-2009, 2007.
- E. P. Kasten and P. K. McKinley, "MESO: Supporting Online Decision Making in Autonomic Computing Systems," *IEEE Transactions on Knowledge and Data Engineering*, 19(4):485-499, April 2007.
- J. Zhang, Z. Zhou, B. H. C. Cheng and P. K. McKinley, "Specifying Real-Time Properties in Autonomic Systems," vol. 3, no. 1, pp. 3-16, March 2007.

- S. Sadjadi, P. McKinley, E. Kasten and Z. Zhou, “MetaSockets: Design and operation of run-time re-configurable communication services,” *Software Practice and Experience*, vol. 36, no. 11–12, pp. 1157–1178, 2006.
- C. Tang and P. K. McKinley, “Energy Optimization under Informed Mobility,” *IEEE Transactions on Parallel and Distributed Systems*, special issue on Localized Communication and Topology Protocols for Ad Hoc Networks, vol. 17, no. 9, pp. 947–962, September 2006.
- P. McKinley, B.H.C. Cheng, and J. Weng, “Integrating Multimedia Technology into the Undergraduate Curriculum,” *International Journal of Engineering Education*, vol. 22, no. 4, 2006.
- P. K. McKinley, S. M. Sadjadi, E. P. Kasten and B. H. C. Cheng, “Composing Adaptive Software,” *IEEE Computer*, vol. 37, no. 7, pp. 56–64, July 2004.
- P. K. McKinley, U. I. Padmanabhan, N. Ancha and S. M. Sadjadi, “Composable Proxy Services to Support Collaboration on the Mobile Internet,” *IEEE Transactions on Computers (Special Issue on Wireless Internet)* vol. 52, no. 6, pp. 713–726, June 2003.
- Y. Huang and P. K. McKinley, “Tree-Based Link-State Routing in the Presence of Routing Information Corruption,” *Computer Communications*, vol. 26 no. 7, pp. 691–699, 2003.
- P. K. McKinley, C. Tang and A. Mani, “A Study of Adaptive Forward Error Correction for Wireless Collaborative Computing,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 13, no. 9, pp. 936–947, September 2002.
- Y. Huang and P. K. McKinley, “Group Leader Election under Link-State Routing,” *Computer Communications*, vol. 23, pp. 653–666, 2000.
- E. Fleury, Y. Huang and P. K. McKinley, “On the Performance and Feasibility of Multicast Core Selection Heuristics,” *Networks*, vol. 35, no. 2, pp. 145–156, John Wiley, 2000.
- D. Judd, P. K. McKinley, A. K. Jain, “Large-Scale Parallel Data Clustering,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 20, no. 8, pp. 871–876, August 1998.
- D. F. Robinson, P. K. McKinley and B. H. C. Cheng, “Path-Based Multicast Communication in Wormhole-Routed Torus Networks,” *Journal of Parallel and Distributed Computing*, vol. 45, pp. 104–121, 1997.
- Y. Huang and P. K. McKinley, “An Adaptive Global Reduction Algorithm for Wormhole-Routed 2D Mesh Networks,” *Parallel Computing*, vol. 23, no. 13, pp. 1909–1936, December 1997.
- Y.-J. Tsai and P. K. McKinley, “An Extended Dominating Node Approach to Broadcast and Global Combine in Multi-Port Wormhole-Routed Mesh Networks,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 8, no. 1, pp. 41–58, January 1997.
- Y.-J. Tsai and P. K. McKinley, “Extended Dominating Node Broadcast in All-Port Wormhole-Routed Torus Networks,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 7, no. 8, August 1996.
- P. K. McKinley, Y.-J. Tsai and D. Robinson, “Collective Communication in Wormhole-Routed Massively Parallel Computers,” *IEEE Computer*, pp. 39–50, December 1995.
- D. F. Robinson, D. Judd, P. K. McKinley and B. H. C. Cheng, “Efficient Multicast Communication in All-Port Wormhole-Routed Hypercubes,” *Journal of Parallel and Distributed Computing*, vol. 31, no. 2, pp. 126–140, December 1995.

- D. F. Robinson, P. K. McKinley and B. H. C. Cheng, “Optimal Multicast Communication in Torus Networks,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 6, no. 10, pp. 1029–1042, October 1995.
- C. Trefftz, P. K. McKinley, C. C. Huang, T.-Y. Li and Z. Zeng, “A Scalable Eigenvalue Solver for Symmetric Tridiagonal Matrices,” *Parallel Computing*, vol. 21, pp. 1213–1240, August 1995.
- X. Lin, P. K. McKinley and L. M. Ni, “The Message Flow Model for Routing in Wormhole-Routed Networks,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 6, no. 7, pp. 755–760, July 1995.
- X. Lin, P. K. McKinley and A.-H. Esfahanian, “Adaptive Multicast Wormhole Routing in 2D Mesh Networks,” *Journal of Parallel and Distributed Computing*, vol. 28, no. 1, pp. 19–31, July 1995.
- C. C. Huang and P. K. McKinley, “Communication Issues in Parallel Computing across ATM Networks,” *IEEE Parallel and Distributed Technology*, vol. 2, no. 4, pp. 73–86, Winter 1994.
- P. K. McKinley, H. Xu, A.-H. Esfahanian and L. M. Ni, “Unicast-Based Multicast Communication in Wormhole-Routed Direct Networks,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 5, no. 12, pp. 1254–1265, December 1994.
- P. K. McKinley, “Group Communication in Staircase Multichannel Lightwave Networks,” *Journal of Parallel and Distributed Computing*, vol. 23, no. 1, pp. 60–71, October 1994.
- H. Xu, E. T. Kalns, P. K. McKinley and L. M. Ni, “ComPaSS: A Communication Package for Scalable Software Design,” *Journal of Parallel and Distributed Computing*, vol. 22, no. 3, pp. 449–461, September 1994.
- X. Lin, P. K. McKinley and L. M. Ni, “Deadlock-free Multicast Wormhole Routing in 2D-Mesh Multicomputers,” *IEEE Transactions on Parallel and Distributed Systems*, vol. 5, no. 8, August 1994.
- M. W. Mutka and P. K. McKinley, “Supporting a Simulation Environment with OpenSim,” *Simulation*, vol. 61, no. 4, pp. 223–235, October 1993.
- L. M. Ni and P. K. McKinley, “A Survey of Wormhole Routing Techniques in Direct Networks,” *IEEE Computer*, vol. 26, no. 2, pp. 62–76, February 1993.
- H. Xu, P. K. McKinley and L. M. Ni, “Efficient Implementation of Barrier Synchronization in Wormhole-Routed Hypercube Multicomputers,” *Journal of Parallel and Distributed Computing*, vol. 16, pp. 172–184, October 1992.
- P. K. McKinley, N. Hasan, R. Libeskind-Hadas and C. L. Liu, “Disjoint Coverings in Replicated Heterogeneous Arrays,” *SIAM Journal of Discrete Mathematics*, vol. 4, pp. 281–291, May 1991.
- P. K. McKinley and J. W. S. Liu, “Multicast Tree Construction in Bus-Based Networks,” *Communications of the ACM*, vol. 33, no. 1, pp. 29–42, January 1990.

Refereed Conference and Workshop Proceedings

- D. B. Knoester and P. K. McKinley, “Evolving Virtual Fireflies,” *Proceedings of the 10th European Conference on Artificial Life*, Budapest, Hungary, September, 2009.
- B. D. Connelly and P. K. McKinley, “Evolving Social Behavior in Adverse Environments,” *Proceedings of the 10th European Conference on Artificial Life*, Budapest, Hungary, September, 2009.

- H. Goldsby, D. B. Knoester, J. Clune, P. K. McKinley and Charles Ofria, “The Evolution of Division of Labor,” *Proceedings of the 10th European Conference on Artificial Life*, Budapest, Hungary, September, 2009.
- D. B. Knoester and P. K. McKinley, “Evolution of Probabilistic Consensus in Digital Organisms,” *Proceedings of the Third IEEE International Conference on Self-Adaptive and Self-Organizing Systems*, San Francisco, California, September, 2009.
- B. E. Beckmann, D. B. Knoester and Philip K. McKinley, “Effects of Communication Impairments on Quorum Sensing,” (poster summary), *Proceedings of the Third IEEE International Conference on Self-Adaptive and Self-Organizing Systems*, San Francisco, California, September, 2009.
- B. E. Beckmann and P. K. McKinley, “Evolving Quorum Sensing in Digital Organisms,” *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2009)*, Montreal, Canada, July, 2009.
- D. B. Knoester, A. Ramirez, P. K. McKinley and Betty H.C. Cheng, “Evolution of Robust Data Distribution Among Digital Organisms,” *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2009)*, Montreal, Canada, July, 2009. (**Best Paper nomination**).
- A. Ramirez, D. B. Knoester, B. H.C. Cheng and P. K. McKinley, “Applying Genetic Algorithms to Decision Making in Autonomic Computing Systems,” *Proceedings of the 6th IEEE International Conference on Autonomic Computing and Communications*, Barcelona, Spain, June 2009. (**Best Paper Award**).
- B. E. Beckmann, L. Grabowski, P. K. McKinley and C. Ofria, “Applying Digital Evolution to the Design of Self-Adaptive Software,” *Proceedings of the 2009 IEEE Symposium on Artificial Life*, Nashville, Tennessee, March 2009.
- B. D. Connelly, P. K. McKinley and B. E. Beckmann, “Evolving Cooperative Pheromone Usage in Digital Organisms,” *Proceedings of the 2009 IEEE Symposium on Artificial Life*, Nashville, Tennessee, March 2009.
- B. E. Beckmann and P. K. McKinley, “Evolution of Adaptive Population Control in Multi-agent Systems,” *Proceedings of the Second IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO)*, pages 181–190, Venice, Italy, October 2008.
- D. B. Knoester, P. K. McKinley, and C. Ofria, “Cooperative Network Construction using Digital Germlines,” *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2008)*, Atlanta, Georgia, July 2008.
- B. E. Beckmann, P. K. McKinley, and C. Ofria, “Selection for Group-Level Efficiency Leads to Self-Regulation of Population Size,” *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2008)*, Atlanta, Georgia, July 2008.
- B. E. Beckmann, L. M. Grabowski, P. K. McKinley, and C. Ofria “Autonomic Software Development Methodology Based on Darwinian Evolution,” poster summary, *Proceedings of the 5th IEEE International Conference on Autonomic Computing*, Chicago, Illinois, June 2008.
- H. J. Goldsby, B. H.C. Cheng, P. K. McKinley, D. B. Knoester, and C. Ofria “Digital Evolution of Behavioral Models for Autonomic Systems,” *Proceedings of the 5th IEEE International Conference on Autonomic Computing*, Chicago, Illinois, June 2008. (**Best Paper Award**).

- F. A. Samimi and P. K. McKinley “Dynamis: Dynamic Overlay Service Composition for Distributed Stream Processing,” *Proceedings of the 20th International Conference on Software Engineering and Knowledge Engineering*, San Francisco, California, 2008.
- D. B. Knoester, P. K. McKinley, B. Beckmann and C. Ofria, “Directed Evolution of Communication and Cooperation in Digital Organisms,” *Proceedings of the 9th European Conference on Artificial Life*, Lisbon, Portugal, September 2007.
- B. Beckmann, P. K. McKinley and C. Ofria, “Evolution of Adaptive Sleep Response in Digital Organisms,” *Proceedings of the 9th European Conference on Artificial Life*, Lisbon, Portugal, September 2007.
- D. B. Knoester, P. K. McKinley and C. Ofria, Using Group Selection to Evolve Leadership in Populations of Self-Replicating Digital Organisms *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2007)*, London, UK, July 2007.
- B. Beckmann, P. K. McKinley, D. B. Knoester and C. Ofria, “Evolution of Cooperative Information Gathering in Self-Replicating Digital Organisms,” *Proceedings of the First IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO)*, Boston, Massachusetts, July 2007.
- E. P. Kasten, P. K. McKinley and S. H. Gage, “Automated Ensemble Extraction and Analysis of Acoustic Data Streams,” *Proceedings of the First International Workshop on Distributed Event Processing, Systems and Applications (DEPSA)*, in conjunction with IEEE ICDCS 2007, Toronto, Ontario, Canada, June 2007.
- H. J. Goldsby, D. B. Knoester, B.H.C. Cheng, P. K. McKinley and C. A. Ofria, Digitally Evolving Models for Dynamically Adaptive Systems *Proceedings of the ICSE Workshop on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*, Minneapolis, Minnesota, May 2007.
- B. H. C. Cheng, P. K. McKinley and C. A. Ofria, “Applying Digital Evolution to the Design of Self-Adaptive ULS Systems (Position Paper),” *Proceedings of the ICSE Workshop on Software Technologies for Ultra-Large-Scale (ULS) Systems*, Minneapolis, Minnesota, May 2007.
- P. K. McKinley, F. A. Samimi, J. K. Shapiro, and C. Tang, “Service Clouds: A Distributed Infrastructure for Constructing Autonomic Communication Services,” *Proceedings of the Second IEEE International Symposium on Dependable, Autonomic and Secure Computing (DASC’06)* Indianapolis, Indiana, September 2006.
- Z. Zhou and P. K. McKinley, “COCA: A Contract-Based Infrastructure for Composing Adaptive Multimedia Systems,” *Proceedings of the 8th International Workshop on Multimedia Network Systems and Applications (MNSA 2006)*, held in conjunction with the IEEE 26th International Conference on Distributed Computing Systems (ICDCS 2006), Lisbon, Portugal, July 2006.
- F. Samimi, P. K. McKinley and S. M. Sadjadi, “Mobile service clouds: A self-managing infrastructure for autonomic mobile computing services,” *Proceedings of the Second IEEE International Workshop on Self-Managed Networks, Systems and Services (SelfMan)*, Dublin, Ireland, June 2006.
- Z. Zhou, J. Zhang, P. McKinley and B. Cheng, “TA-LTL: Specifying Adaptation Timing Properties in Autonomic Systems,” *Proceedings of the Third IEEE Workshop on Engineering of Autonomic Systems (EASe 2006)*, Columbia, Maryland, April 2006.
- S. M. Sadjadi and P. K. McKinley, “Using Transparent Shaping and Web Services to Support Self-Management of Composite Systems,” *Proceedings of the Second IEEE International Conference on Autonomic Computing (ICAC)*, Seattle, Washington, June 2005.

- S. Fleming, B. H. C. Cheng, R. E. K. Stirewalt and P. K. McKinley, “An Approach to Implementing Dynamic Adaptation in C++,” *Proceedings of the ICSE Workshop on Design and Evolution of Autonomic Application Software (DEAS)*, St. Louis, Missouri, May 2005.
- S. M. Sadjadi, P. K. McKinley and B. H. C. Cheng, “Transparent Shaping of Existing Software to Support Pervasive and Autonomic Computing,” *Proceedings of the ICSE Workshop on Design and Evolution of Autonomic Application Software (DEAS)*, St. Louis, Missouri, May 2005.
- C. Tang and P. K. McKinley, “Improving Mutipath Reliability in Topology-Aware Overlay Networks,” *Proceedings of the Fourth International Workshop on Assurance in Distributed Systems and Networks (ADSN 2005)*, in conjunction with the 25th IEEE International Conference on Distributed Computing Systems, June 2005.
- C. Tang and P. K. McKinley, “iMobif: An Informed Mobility Framework for Energy Optimization in Wireless Ad Hoc Networks,” *Proceedings of the Second International Workshop on Wireless Ad Hoc Networking (WWAN 2005)*, in conjunction with the 25th IEEE International Conference on Distributed Computing Systems, June 2005.
- E. P. Kasten and P. K. McKinley, “MESO: Perceptual Memory to Support Online Learning in Adaptive Software,” *Proceedings of the 3rd International Conference on Development and Learning (ICDL'04)*, La Jolla, California, October, 2004.
- S. M. Sadjadi, P. K. McKinley, B. H.C. Cheng and R. E. K. Stirewalt, “TRAP/J: Transparent Generation of Adaptable Java Programs,” *Proceedings of the International Symposium on Distributed Objects and Applications (DOA 2004)*, Agia Napa, Cyprus, October 2004.
- Z. Yang, Z. Zhou, B. H.C. Cheng and P. K. McKinley. “Enabling Collaborative Adaptation across Legacy Components,” *Proceedings of The 3rd Workshop on Reflective and Adaptive Middleware (RM 2004)*, in conjunction with the ACM/IFIP/USENIX 5th International Middleware Conference (Middleware 2004), Toronto, Ontario, Canada, October 2004.
- F. A. Samimi, P. K. McKinley, S. M. Sadjadi and P. Ge, “Kernel-Middleware Interaction to Support Adaptation in Pervasive Computing Environments,” *Proceedings of the Second International Workshop on Middleware for Pervasive and Ad-Hoc Computing (MPAC 2004)*, in conjunction with the ACM/IFIP/USENIX 5th International Middleware Conference (Middleware 2004), Toronto, Ontario, Canada, October 2004.
- Z. Zhou, P. K. McKinley and S. M. Sadjadi, “On Quality-of-Service and Energy Consumption Trade-offs in FEC-Enabled Audio Streaming,” *Proceedings of the 12th IEEE International Workshop on Quality of Service (IWQoS 2004)* Montreal, Canada, June 2004. (**Selected as Best Student Paper**).
- J. Zhang, Z. Yang, B. H.C. Cheng and P. K. McKinley, “Adding Safeness to Dynamic Adaptation Techniques,” *Proceedings of the ICSE 2004 Workshop on Architecting Dependable Systems* Edinburgh, Scotland, May 2004.
- S. M. Sadjadi and P. K. McKinley, “Transparent Self-Optimization in Existing CORBA Applications,” *Proceedings of the International Conference on Autonomic Computing (ICAC)*, New York, May 2004.
- S. M. Sadjadi, P. K. McKinley, R. E. K. Stirewalt and B. H.C. Cheng, “Generation of Self-Optimizing Wireless Network Applications,” (Poster Summary), *Proceedings of the International Conference on Autonomic Computing (ICAC)*, New York, May 2004.

- C. Tang and P. K. McKinley, "A Distributed Approach of Topology-Aware Overlay Path Monitoring," *Proceedings of THE 24th IEEE International Conference on Distributed Computing Systems (ICDCS 2004)*, Tokyo, Japan, March 2004.
- S. M. Sadjadi and P. K. McKinley, "ACT: An Adaptive CORBA Template to Support Unanticipated Adaptation," *Proceedings of the 24th International Conference on Distributed Computing Systems (ICDCS 2004)*, Tokyo, Japan, March 2004.
- E. P. Kasten and P. K. McKinley, "Perimorph: Run-Time Composition and State Management for Adaptive Systems," *Proceedings of the Fourth International Workshop on Distributed Auto-adaptive and Reconfigurable Systems (with ICDCS 2004)*, March 2004.
- C. Tang and P. K. McKinley, "On the Cost-Quality Tradeoff in Topology-Aware Overlay Path Probing," *Proceedings of the IEEE International Conference on Network Protocols (ICNP'03)*, Atlanta, Georgia, November 2003.
- C. Tang and P. K. McKinley, "Modeling Multicast Packet Losses in Wireless LANs," *Proceedings of the ACM International Workshop on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM'03)*, in conjunction with *ACM Mobicom*, San Diego, September 2003.
- S. Sadjadi, P. K. McKinley, E. P. Kasten, "Architecture and Operation of an Adaptable Communication Substrate," *Proceedings of the Ninth IEEE International Workshop on Future Trends in Distributed Computing*, San Juan, Puerto Rico, May 2003.
- Z. Yang, B. H. C. Cheng, R. E. K. Stirewalt, J. Sowell, S. M. Sadjadi and P. K. McKinley, "An Aspect-Oriented Approach to Dynamic Adaptation," *Proceedings of the ACM SIGSOFT Workshop on Self-Healing Systems (WOSS02)*, Charleston, South Carolina, November 2002.
- P. K. McKinley, S. Sadjadi, E. P. Kasten and R. Kalaskar, "Programming Language Support for Adaptable Wearable Computing," *Proceedings of the Sixth International Symposium on Wearable Computers*, Seattle, Washington, October 2002.
- P. K. McKinley, S. M. Sadjadi and E. P. Kasten, "An Adaptive Software Approach to Intrusion Detection and Response," *Proceedings of the 10th International Conference on Telecommunication Systems, Modeling and Analysis*, Monterey, California, October 2002.
- S. M. Sadjadi, P. K. McKinley and E. P. Kasten, "MetaSockets: Run-Time Support for Adaptive Communication Services," (Poster Summary) *Addendum to the Proceedings of the 2002 International Symposium on Distributed Objects and Applications*, Irvine, California, October 2002.
- C. Tang and P. K. McKinley, "Queueing Losses and Adaptive Reliable Multicast in Wireless LANs," *Proceedings of the IEEE International Conference on Networking*, Atlanta, Georgia, August 2002.
- P. Ge and P. K. McKinley, "Leader-Driven Multicast for Video Streaming on Wireless LANs," *Proceedings of the IEEE International Conference on Networking*, Atlanta, Georgia, August 2002.
- J. Zhang, J. Lee and P. K. McKinley, "Optimizing Java Piped I/O Stream Library for Performance," *Proceedings of the 15th Workshop on Languages and Compilers for Parallel Computing (LCPC)*, College Park, Maryland, July 2002.
- E. Kasten, P. K. McKinley, S. Sadjadi and R. Stirewalt, "Separating Introspection and Intercession in Metamorphic Distributed Systems," *Proceedings of the IEEE Workshop on Aspect-Oriented Programming for Distributed Computing (with ICDCS'02)*, Vienna, Austria, July 2002.

- P. K. McKinley, E. P. Kasten, S. M. Sadjadi and Zhinan Zhou, "Realizing Multi-Dimensional Software Adaptation," *Proceedings of the ACM Workshop on Self-Healing, Adaptive and self-MANaged Systems (SHAMAN)*, held in conjunction with the 16th Annual ACM International Conference on Supercomputing, New York City, June 2002.
- P. Ge and P. K. McKinley, "Comparisons of Error Control Techniques for Wireless Video Multicasting," *Proceedings of the 21st IEEE International Performance, Computing, and Communications Conference*, Phoenix, Arizona, April 2002.
- B. Cheng, L. Dillon, R. Stirewalt, P. K. McKinley, S. Kulkarni, and J. Lee, "Automated Development and Run-Time Adaptation of Interactive Distributed Applications," *Proceedings of the Workshop on New Visions for Software Design and Productivity: Research and Applications*, sponsored by NSF, DARPA and other agencies, Nashville, Tennessee, December 2001.
- P. K. McKinley, U. Padmanabhan and N. Ancha, "Experiments in Composing Proxy Audio Services for Mobile Users," *Proceedings of the IFIP/ACM International Conference on Distributed Systems Platforms (Middleware 2001)*, pp. 99-120, Heidelberg, Germany, November 2001.
- P. Ge and P. K. McKinley, "Experimental Evaluation of Error Control for Video Multicast over Wireless LANs," *Proceedings of the Third International Workshop on Multimedia Network Systems*, 2001.
- P. K. McKinley and U. I. Padmanabhan, "Design of Composable Proxy Filters for Mobile Computing," *Proceedings of the Second International Workshop on Wireless Networks and Mobile Computing*, 2001.
- P. K. McKinley and A. P. Mani, "A Study of Proxy-Based Adaptive Forward Error Correction for Collaborative Computing on Wireless LANs," *Proceedings of the IEEE Symposium on Applications and the Internet (SAINT)*, San Diego, California, January 2001.
- P. K. McKinley and S. Gaurav, "Experimental Evaluation of Forward Error Correction on Multicast Audio Streams in Wireless LANs," (Poster Summary), *Proceedings of ACM Multimedia 2000*, Los Angeles, California, October 2000.
- P. K. McKinley and J. Li, "Pocket Pavilion: Synchronous Collaborative Browsing for Wireless Handheld Computers," *Proceedings of the IEEE International Conference on Multimedia and Expo*, New York, July 2000.
- J. M. Arango and P. K. McKinley, "VGuide: Design and Performance Evaluation of a Synchronous Collaborative Virtual Reality Application," *Proceedings of the IEEE International Conference on Multimedia and Expo*, New York, July 2000.
- P. K. McKinley, A. M. Malenfant and J. M. Arango, "Pavilion: A Distributed Framework for Collaborative Web-Based Applications," *Proceedings of ACM GROUP'99*, Phoenix, Arizona, November 1999.
- P. K. McKinley, R. T. Rao and R. F. Wright, "H-RMC: A Hybrid Reliable Multicast Protocol in the Linux Kernel," *Proceedings of IEEE SC'99*, Portland, Oregon, November 1999.
- P. K. McKinley and R. F. Wright, "RMC: Reliable Multicasting in the Linux Kernel," *12th International Conference on Parallel and Distributed Computing Systems*, Fort Lauderdale, Florida, August 1999.
- P. K. McKinley, R. R. Barrios, A. M. Malenfant, "Design and Performance Evaluation of a Java-Based Instructional Tool", *Proceedings of the IEEE International Conference on Distributed Computing Systems*, Austin, Texas, June 1999.

- P. K. McKinley, B. H. C. Cheng, J. J. Weng, “Moving Industry-Guided Multimedia Technology into the Classroom,” *Proceedings of the ACM Conference on Computer Science Education*, New Orleans, Louisiana, pp. 160-164, March 1999.
- E. Fleury, Y. Huang, P. K. McKinley, “On the Performance and Feasibility of Multicast Core Selection Heuristics,” *Proceedings of the Seventh International Conference on Computer Communications and Networks*, Lafayette, Louisiana, October 1998.
- Y. Huang, E. Fleury and P. K. McKinley, “LCM: A Multicast Core Management Protocol for Link-State Routing Networks,” *Proceedings of the IEEE International Conference on Communications (ICC)*, Atlanta, Georgia, June 1998.
- Y. Huang and P. K. McKinley, “Optimal Switch-Aided Flooding in ATM Networks,” *Proceedings of the IEEE ATM’98 Workshop*, Fairfax, Virginia, May 1998.
- Y. Huang and P. K. McKinley, “A Centralized Generic Protocol for Multipoint Connections,” *Proceedings of 22nd IEEE Conference on Computer Networks*, Minneapolis, Minnesota, November 1997.
- Y. Huang and P. K. McKinley, “Group Leader Election under Link-State Routing,” *Proceedings of IEEE International Conference on Network Protocols*, Atlanta, Georgia, October 1997.
- Y.-j. Tsai and P. K. McKinley, “The Tau-Model: A Unified Communication Cost Model,” *Proceedings of the 10th International Conference on Parallel and Distributed Computing Systems*, New Orleans, Louisiana, October 1997.
- E. Kass and P. K. McKinley, “IMcast: An Object-Oriented Tool for Image Multicasting,” *Proceedings of IEEE International Conference on Multimedia Computing Systems*, Ottawa, Canada, June 1997.
- Y. Huang and P. K. McKinley, “Switch-Aided Flooding Operations in ATM Networks,” *Proceedings of IEEE INFOCOM’97*, Kobe, Japan, April 1997.
- D. Judd, P. K. McKinley and A. K. Jain, “Performance Evaluation of Parallel Data Clustering in NOW Environments,” *Proceedings of the Eighth SIAM Conference on Parallel Processing for Scientific Computing*, Minneapolis, Minnesota, March 1997.
- Y.-j. Tsai and Y. Huang and P. K. McKinley, “Performance Evaluation of Barrier Synchronization on ATM Networks,” *Proceedings of the 1996 IEEE International Conference on Computer Communications and Networks*, October 1996.
- D. Judd and P. K. McKinley and A. K. Jain, “Large-Scale Parallel Data Clustering,” *Proceedings of the 13th International Conferences on Pattern Recognition*, Vienna, Austria, August 1996.
- Y. Huang and P. K. McKinley, “Efficient Collective Operations with ATM Network Interface Support,” *Proceedings of the 1996 International Conference on Parallel Processing*, vol. I, Bloomington, Illinois, pp. 34–43, August 1996.
- C. C. Huang and P. K. McKinley, “COGS: An Object-Oriented Toolkit for Building Configurable Process Group Services,” *Proceedings of the Twentieth International Conference on Technology of Object-Oriented Languages and Systems (TOOLS’USA96)*, Santa Barbara, California, July 1996.
- Y. Huang and P. K. McKinley, “A Lightweight Protocol for Multipoint Connections under Link-State Routing,” *Proceedings of the 16th IEEE International Conference on Distributed Computing Systems*, Hong Kong, pp. 335–343, May 1996.

- Y. Huang, C. C. Huang and P. K. McKinley, “Multicast Virtual Topologies for Collective Communication in MPCs and ATM Clusters,” *Proceedings of Supercomputing’95*, San Diego, California, December 1995.
- Y. Huang and P. K. McKinley, “An Adaptive Global Reduction Algorithm for Wormhole-Routed 2D Mesh Networks,” *Proceedings of the Seventh IEEE Symposium on Parallel and Distributed Processing*, San Antonio, Texas, pp. 114–119, October 1995.
- C. C. Huang, Y. Huang and P. K. McKinley, “A Thread-Based Interface for Collective Communication on ATM Networks,” *Proceedings of the 15th IEEE International Conference on Distributed Computing Systems*, Vancouver, British Columbia, pp. 254–261, May 1995. **(Nominated for Best Paper Award)**.
- C. Trefftz and P. K. McKinley and T.-Y. Li and Z. Zeng, “A Parallel Algorithm for the Singular Value Problem in Bidiagonal Matrices,” *Proceedings of the Seventh SIAM Conference on Parallel Processing for Scientific Computing*, San Francisco, California, pp. 62–67, February 1995.
- Y.-J. Tsai and P. K. McKinley, “Extended Dominating Node Broadcast in All-Port Wormhole-Routed Torus Networks,” *Proceedings of the Fifth Symposium on the Frontiers of Massively Parallel Computation*, McLean, Virginia, pp. 529–536, February 1995.
- Y.-J. Tsai and P. K. McKinley, “Broadcast in All-Port Wormhole-Routed 3D Mesh Networks Using Extended Dominating Sets,” *Proceedings of the 1994 International Conference on Parallel and Distributed Systems*, pp. 120–127, December 1994.
- C. C. Huang and E. P. Kasten and P. K. McKinley, “Design and Implementation of Multicast Operations for ATM-Based High Performance Computing,” *Proceedings of IEEE Supercomputing’94*, Washington, D.C., pp. 164–173, November 1994.
- D. Judd, N. K. Ratha, P. K. McKinley, J. Weng and A. K. Jain, “Parallel Implementation of Vision Algorithms on Workstation Clusters,” *Proceedings of the 12th International Conference on Pattern Recognition*, Jerusalem, Israel, pp. 317–321, October 1994.
- D. F. Robinson, P. K. McKinley and B. H. C. Cheng, “Optimal Multicast Communication in Torus Networks,” *Proceedings of the 1994 International Conference on Parallel Processing*, vol. I, St. Charles, Illinois, pp. 134–141, August 1994.
- C. C. Huang and P. K. McKinley, “Parallel Reduction Operations on ATM Networks,” *Proc. of the 1994 IEEE Symposium on High-Performance Distributed Computing*, San Francisco, California, pp. 43–50, August 1994.
- Y.-J. Tsai and P. K. McKinley, “A Dominating Set Model for Broadcast in Wormhole-Routed 2D Mesh Networks,” *Proceedings of the Eighth ACM International Conference on Supercomputing*, Manchester, England, pp. 126–135, July 1994.
- C. Trefftz, P. K. McKinley, C. C. Huang, T.-Y. Li and Z. Zeng, “Design and Performance Evaluation of a Distributed Eigenvalue Solver on a Workstation Cluster,” *Proceedings of the 14th International Conference on Distributed Computing Systems*, Poznan, Poland, pp. 608–615, June 1994.
- Y.-J. Tsai and P. K. McKinley, “An Extended Dominating Node Approach to Collective Communication in Wormhole-Routed 2D Meshes,” *Proceedings of the IEEE Scalable High Performance Computing Conference*, pp. 199–206, May 1994.

- X. Lin, A.-H. Esfahanian, P. K. McKinley and A. Burago, “Adaptive Multicast Wormhole Routing in Hypercube Multicomputers,” in the *Proceedings of the Fifth IEEE Symposium on Parallel and Distributed Processing*, Dallas, Texas, pp. 72–79, December 1993.
- D. F. Robinson, D. Judd, P. K. McKinley and B. H. C. Cheng, “Efficient Collective Data Distribution in All-Port Wormhole-Routed Hypercubes,” *Proceedings of Supercomputing’93*, Portland, Oregon, pp. 792–801, November 1993.
- P. K. McKinley and C. Trefftz, “Efficient Broadcast in All-Port Wormhole Routed Hypercubes,” *Proceedings of the 1993 International Conference on Parallel Processing*, vol. II, St. Charles, Illinois, pp. 288–291, August 1993.
- X. Lin, P. K. McKinley and L. M. Ni, “The Message Flow Model for Routing in Wormhole-Routed Networks,” *Proceedings of the 1993 International Conference on Parallel Processing*, vol. I, St. Charles, Illinois, pp. 294–297, August 1993.
- X. Lin, P. K. McKinley and A.-H. Esfahanian, “Adaptive Multicast Wormhole Routing in 2D Mesh Multicomputers,” *Proceedings of 1993 Parallel Architectures and Languages Europe Conference (PARLE’93)*, Munich, Germany, pp. 228–241, June 1993.
- C. Trefftz, P. K. McKinley, T.-Y. Li and Z. Zeng, “A Scalable Eigenvalue Solver for Symmetric Tridiagonal Matrices,” *Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing*, Norfolk, Virginia, pp. 602–609, March 1993.
- P. K. McKinley and C. Trefftz, “MultiSim: A Tool for the Study of Large-Scale Multiprocessors,” *Proceedings of the 1993 International Workshop on Modeling, Analysis and Simulation of Computer and Telecommunication Networks (MASCOTS)*, San Diego, California, pp. 57–62, January 1993.
- C. Trefftz and P. K. McKinley, “Performance Evaluation of Wormhole Routing in Octagonal Mesh Multicomputers,” *Proceedings of the 1992 Conference on Parallel and Distributed Systems*, Hsinchu, Taiwan, pp. 25–33, December 1992.
- P. K. McKinley, H. Xu, E. Kalns and L. M. Ni, “ComPaSS: Efficient Communication Services for Scalable Architectures,” *Proceedings of IEEE Supercomputing’92*, Minneapolis, Minnesota, pp. 478–487, November 1992.
- H. Xu, P. K. McKinley and L. M. Ni, “A Scalable Multicast Service for Mesh Networks,” *Proceedings of Frontiers’92: The 5th Symposium on the Frontiers of Massively Parallel Computation*, McLean, Virginia, pp. 156–163, October 1992.
- P. K. McKinley, H. Xu, A.-H. Esfahanian and L. M. Ni, “Unicast-Based Multicast Communication in Wormhole-Routed Networks,” *Proceedings of the 1992 International Conference on Parallel Processing*, vol. II, St. Charles, Illinois, pp. 10–19, August 1992.
- H. Xu, P. K. McKinley and L. M. Ni, “Efficient Implementation of Distributed Barrier Synchronization in Hypercube Multicomputers,” *Proceedings of the 12th International Conference on Distributed Computing Systems*, Yokohama, Japan, pp. 118–125, June 1992.
- M. W. Mutka and P. K. McKinley, “The OpenSim Approach – Tools for Management and Analysis of Simulation Jobs,” *Proceedings of the USENIX Winter 1992 Technical Conference*, San Francisco, California, pp. 291–304, January 1992.
- X. Lin, P. K. McKinley and L. M. Ni, “Performance Evaluation of Multicast Wormhole Routing in 2D-Mesh Multicomputers,” *Proceedings of the 1991 International Conference on Parallel Processing*, vol. I, pp. 435–442, August 1991.

- P. K. McKinley, “Lightwave Multichannel Networks with Grid-Based Topologies,” *Proceedings of the International Phoenix Conference on Computers and Communications*, Scottsdale, Arizona, pp. 506–512, March 1991.
- B. Rajagopalan and P. K. McKinley, “A Token-Based Protocol for Reliable, Ordered Multicast,” *Proceedings of the Eighth Symposium on Reliable Distributed Systems*, Seattle, Washington, October 1989.
- P. K. McKinley and J. W. S. Liu, “Group Communication in Multichannel Networks with Staircase Interconnection Topologies,” *Proceedings of SIGCOMM*, Austin, Texas, pp. 170–181, September 1989.
- P. K. McKinley and J. W. S. Liu, “Multicast Tree Construction in Bus-Based Networks,” *Proc. International Phoenix Conference on Computers and Communications*, Scottsdale, Arizona, pp. 171–177, March 1989. **(Best Paper Award)**.
- P. K. McKinley, “Multicast Routing in Spanning Bus Hypercubes,” *Proc. International Conference on Parallel Processing*, St. Charles, Illinois, pp. 204–211, August 1988.
- P. K. McKinley and J. W. S. Liu, “Multicast Routing in Bus-Based Computer Networks,” *Proceedings of the Computer Networking Symposium*, Washington, D.C., pp. 277–287, April 1988.
- D. A. Reed, P. K. McKinley and M. Barr, “Performance Analysis of Switching Strategies,” *Proc. Symposium on the Simulation of Computer Networks*, Colorado Springs, Colorado, pp. 130–141, August 1987.
- P. K. McKinley and Y. Ofek, “Resource Sharing in a Synchronous Optical Hypergraph,” *Proc. Symposium on the Simulation of Computer Networks*, Colorado Springs, Colorado, pp. 159–169, August 1987.

Invited Publications

- P. K. McKinley, R. Stirewalt, B. Cheng, L. Dillon, S. Kulkarni, “Interactive Distributed Applications and the Computer Science Curriculum,” *IEEE Distributed Systems Online*, October 2002.
- P. K. McKinley, “Design of Collective Communication Operations on ATM Networks,” *Newsletter of the Technical Committee on Distributed Processing*, IEEE Computer Society, Summer 1997.
- P. K. McKinley, “Support for Collective Communication in MPCs and Clusters,” *Technical Committee on Computer Architecture Newsletter*, IEEE Computer Society, pp. 28-30, Summer-Fall Issue, 1994.

Thesis/Project Supervision

Ph.D. Students

- Brian Connelly, “Digital Evolution of Cooperative Communication Behavior,” current student.
- Daniel Couvertier, “Evolution of Cooperative Predation,” current student.
- David Knoester, “Evolution of Cooperative Behavior in Distributed Systems,” current student.
- Benjamin Beckmann, “Dynamic Software Adaptation in Sensor Networks,” current student.

- Farshad Samimi, “Service Clouds: Overlay-Based Infrastructure for Autonomic Communication Services,” Ph.D., December 2007. Currently with a GoldSpot Media.
- Eric Kasten, “An Integrated Approach to Autonomous Computation in Data Streaming Applications,” Ph.D., May 2007. Currently research staff at Michigan State University.
- Zhinan Zhou, “Design and Evaluation of Adaptive Software for Mobile Computing Systems,” Ph.D., August 2006. Currently with Samsung Corporation.
- Chiping Tang, “Underlay-Aware Overlay Networks,” Ph.D., August 2005. Currently with Microsoft Corporation.
- Peng Ge, “Interactive Video Multicast in Wireless LANs,” Ph.D., December 2004. Currently with Intel Corporation.
- Masoud Sadjadi, “Transparent Shaping Support for Adaptability in Pervasive and Autonomic Computing,” Ph.D., August 2004. Current position: Assistant Professor, School of Computer Science, Florida International University.
- Yih Huang, “Group Communication under Link-State Routing,” Ph.D., May 1998. Position upon graduation: Assistant Professor, Department of Computer Science, George Mason University.
- Yih-jia Tsai, “Modeling Collective Communication: Design and Performance Evaluation,” Ph.D., May 1997. Position upon graduation: Assistant Professor, Department of Computer Science and Information Engineering, Tamkang University, Taiwan.
- David F. Robinson, “Scalable Multicast Communication in Massively Parallel Computers,” Ph.D., 1994 (co-advised with B. Cheng). Current position: Associate Professor, Department of Computer Science, Quincy University.
- Christian Trefftz, “Effects of Collective Communications in Parallel Numerical Algorithms,” Ph.D., 1994. Current position: Associate Professor, Department of Computer Science, Grand Valley State University.

M.S. Students

- David Knoester, “Using Developmental Learning for Network Intrusion Detection,” M.S. thesis, May 2004.
- Rahul Kalaskar, “Collaborative Multimedia Computing with Adaptive Middleware,” M.S. project, May 2003.
- Chiping Tang, “Simulation of reliable multicast communication in wireless local area networks,” M.S. thesis, May 2002.
- Udiyan Padmanabhan, “Design of a Composable Proxy Framework,” M.S. project, May 2001.
- Suraj Gaurav, “Experimental Evaluation of Forward Error Correction on Multicast Audio Streams in Wireless LANs,” M.S. project, May 2001.
- Arun Mani, “Performance studies of forward error correction in wireless local area networks,” M.S. project, August 2000.
- Ji Li, “Pocket Pavilion: Extending collaborative applications to wireless handheld computers,” MS project, May 2000.

- Jesus Arango, “VGuide: Design and Performance Evaluation of a synchronous collaborative virtual reality application,” MS project, May 2000.
- Aaron Malenfant, “Pavilion: A Middleware Framework for Collaborative Web-Based Applications,” M.S. project, May 2000.
- Ravi Rao, H-RMC: A Hybrid Reliable Multicast Protocol for the Linux Kernel, M.S. project, July 1999.
- Robin Wright, “Design of Flow Control Mechanisms for Reliable Multicast,” M.S. thesis, December 1998.
- Robel Barrios, “WEBCLASS: A Multimedia Web-Based Instructional Tool,” M.S. project, August 1998.
- Gerald Fordyce, “Implementing Collective Operations in the Windows NT Operating System,” M.S. project, December 1997.
- Eric Kasten, “O2Threads: An Object-Oriented Threads Package for Internet Applications,” M.S. project, May 1997.
- Eric Kass, “IMcast: An Object-Oriented Image Multicasting System,” M.S. project, December 1996.
- Manish Rathi, “A Monitoring and Testing Tool for ATM LANs,” M.S. project, 1996.
- Tharuna Nirajan “A Video Conferencing Package for Computer Network Instruction,” M.S. project, 1996.

Undergraduates

- Joseph Meleca, undergraduate research assistant, “Evolution of Resistance in Digital Organisms,” summer 2009.
- Anthony Curley, Professorial Assistant, Experimental research in evolutionary robotics, 2008-present.
- Alex Kuhn, “Simulation of Wireless Sensor Network Systems and Protocols,” 2006-2007.
- Paul Labadie, “Design of an Object-Oriented Multicast Video Server,” 1995-1996.
- Scott Hetrick, “Java-based Applications on World-Wide Web,” 1995-1996.
- Joseph D. Budzyn, “Design and Performance of a Video Server,” Summer 1995.
- Wendy S. Weiss, “MultiSim⁺⁺: An Object-Oriented Simulator of Parallel Computer Architectures,” 1993–1994.
- C. Jeremy Uniacke, “Parallel Numerical Algorithms on Workstation Clusters,” Summer 1993.
- William J. Ryan, “Load Balancing in a Scalable Eigenvalue Solver,” Summer 1992,

Teaching Experience

University Courses Developed and Taught

- Selected Topics in Biologically-Inspired Distributed Systems (graduate, seminar/project)
- Selected Topics in Autonomic Computing Systems (graduate, seminar/project)
- Selected Topics in Sensor Networks (graduate, seminar/project)
- Selected Topics in Mobile Computing and Communications (graduate, seminar/project)
- Selected Topics in Computer Networks and Distributed Systems (graduate, seminar/project)
- Advanced Topics in Computer Networks (graduate, lecture/project)
- Advanced Operating Systems (graduate, lecture/project)
- Advanced Computer Architecture (graduate, lecture/project)
- Operating Systems (undergraduate, lecture/laboratory)
- Computer Networks (undergraduate, lecture/laboratory)
- Computer Communications (undergraduate, lecture/laboratory)

Short Courses Offered

- “Programming Support for Distributed-Memory Computing Environments,” (with L.M. Ni). The course was offered at two conferences: the Seventh International Parallel Processing Symposium (IPPS), Newport Beach, California, April 1993, and the 13th IEEE International Conference on Distributed Computing Systems (ICDCS) Pittsburgh, Pennsylvania, May 1993.

Development of Instructional Resources

- Continuous development of new laboratory exercises/projects for undergraduate and graduate systems, enabling students to gain experience in developing interesting applications. Examples include: sensor network simulation, data classification methods, audio/video streaming, collaborative web browsing, data compression and encryption, error control techniques for wireless networks.
- Development of course packs for computer networks and operating systems courses. These have been used by several other faculty at MSU and by faculty at other institutions (e.g., Clemson, Arizona State, George Mason, Saginaw Valley State, Grand Valley State)
- Integration of major new topics into courses over the years (e.g., Linux kernel internals, middleware technologies, mobile computing and wireless networking, video streaming, sensor networks, workstation cluster software design).

Service Activities

Professional Service

- **Editorial Board Member**

- *IEEE Transactions on Parallel and Distributed Systems*, 2001-2005.

- **Program Co-Chair**

- 2003 IEEE International Conference on Distributed Computing Systems, Providence, Rhode Island, May 2003.

- **Program Committee Vice Chair**

- 2005 IEEE International Conference on Pervasive Computing and Communications (PerCom), Kauai, Hawaii, March 2005.
- 2001 IEEE International Conference on Distributed Computing Systems (ICDCS), Phoenix, Arizona, April 2001 (VC for Internet Technologies)
- 2000 IEEE International Conference on Distributed Computing Systems (ICDCS), Taipei, Taiwan, April 2000 (VC for Distributed Operating Systems)

- **Program Committee Member**

- Third IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO) San Francisco, California, September 2009.
- Sixth IEEE International Conference on Autonomic Computing (ICAC), Barcelona, Spain, June 2009.
- Second IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO) Venice, Italy, October 2008.
- First International Conference on Autonomic Computing and Communication Systems (Autonomics'07) Rome, Italy, October 2007.
- First Workshop on Software Engineering for Pervasive Computing Applications and Systems (SEPCAS) Minneapolis, Minnesota, May 2007.
- ACM/IFIP/USENIX 7th International Middleware Conference, Melbourne, Australia, November 2006.
- 2006 IEEE International Conference on Distributed Computing Systems, Lisbon, Portugal, July 2006.
- Fourth Workshop on Adaptive and Reflective Middleware (ARM 2005), Grenoble, France, November 2005.
- 2005 International Symposium on Distributed Objects and Applications (DOA), Agia Napa, Cyprus, October 2005.
- Fifth International Workshop on Software Engineering and Middleware (SEM 2005), co-located with ESEC/FSE'05, Lisbon, Portugal, September 2005.
- Fourth IEEE International Symposium on Network Computing and Applications (IEEE NCA05) Cambridge, Massachusetts, July 2005.
- 2005 IEEE International Conference on Autonomic Computing, Seattle, Washington, June 2005.
- 2005 IEEE International Conference on Distributed Computing Systems, Columbus, Ohio, June 2005.

- 2005 International Conference on Parallel Processing, Oslo, Norway, June 2005
- Tenth IEEE International Workshop on Future Trends in Distributed Computing Systems, Suzhou, China, May 2004.
- 2004 IEEE International Conference on Pervasive Computing and Communications, Orlando, Florida, March 2004.
- 2004 International Workshop on Distributed Auto-adaptive and Reconfigurable Systems, Tokyo, Japan, March 2004.
- 2002 IEEE International Conference on Distributed Computing Systems, Vienna, Austria, July 2002.
- 2002 International Conference on Parallel Processing, Vancouver, Canada, August 2002
- 2002 Workshop on Aspect Oriented Programming for Distributed Computing Systems, Vienna, Austria, July 2002.
- 2000 International Conference on Parallel Processing, Toronto, Canada, August 2000.
- 1999 IEEE International Conference on Computer Communications and Networks, Boston, Massachusetts, October 1999.
- 1999 International Workshop on Group Communication, Aizu, Japan, September 1999.
- 1998 IEEE International Conference on Parallel and Distributed Systems, Tainan, Taiwan, December 1998
- 1998 IEEE International Conference on Computer Communications and Networks, October 1998.
- 1997 IEEE International Conference on Parallel and Distributed Systems, Seoul, Korea, December 1997.
- Sixth IEEE Symposium on High-Performance Distributed Computing, August 1997.
- Third IEEE Symposium on High-Performance Computer Architecture, January 1997.
- 1996 International Conference on Parallel Processing, August 1996.
- 1995 IEEE International Conference on Distributed Computing Systems, Vancouver, British Columbia, May 1995.
- 1994 IEEE International Conference on Parallel and Distributed Systems, Hsinchu, Taiwan, December 1994.
- 1993 IEEE International Conference on Parallel and Distributed Systems, Taipei, Taiwan, December 1993.
- 13th IEEE International Conference on Distributed Computing Systems, Pittsburgh, Pennsylvania, June 1993.
- 1993 Phoenix Conference on Computers and Communications, Phoenix, Arizona, March 1993.
- 1992 Phoenix Conference on Computers and Communications, Phoenix, Arizona, March 1992.

- **Workshops Chair**

- 2005 IEEE International Conference on Distributed Computing Systems, Columbus, Ohio, June 2005.

- **Publicity Chair**

- 1998 IEEE International Conference on Distributed Computing Systems, Amsterdam, The Netherlands, May 1998.

- 1995 IEEE International Symposium on High-Performance Computer Architecture, Raleigh, North Carolina, January 1995.

- **Session Chair**

- 2007 IEEE International Conference on Distributed Computing Systems, Toronto, Ontario, July 2007.
- 2006 IEEE International Conference on Distributed Computing Systems, Lisbon, Portugal, July 2006.
- Second IEEE International Workshop on Self-Managed Networks, Systems and Services (Self-Man), Dublin, Ireland, June 2006.
- 2005 IEEE International Conference on Autonomic Computing, Seattle, Washington, June 2005.
- 2005 IEEE International Conference on Distributed Computing Systems, Columbus, Ohio, June 2005.
- 2005 IEEE International Conference on Pervasive Computing and Communications (PerCom), Kauai, Hawaii, March 2005.
- 2004 International Workshop Quality of Service, Montreal, Canada, June 2004.
- 2004 IEEE International Conference on Autonomic Computing, New York, May 2004.
- 2004 International Workshop Distributed Auto-adaptive and Reconfigurable Systems, Hachioji, Japan, March 2004.
- 2004 IEEE International Conference on Distributed Computing Systems, Hachioji, Japan, March 2004.
- 2003 IEEE International Workshop on Modeling Analysis and Simulation of Wireless and Mobile Systems, San Diego, California, September 2003.
- Ninth IEEE International Workshop on Future Trends in Distributed Computing Systems, San Juan, Puerto Rico, June 2003.
- 2002 IEEE International Conference on Distributed Computing Systems, Vienna, Austria, July 2002.
- 2001 IEEE International Conference on Distributed Computing Systems, Phoenix, Arizona, April 2001.
- Third International Workshop on Multimedia Network Systems, Phoenix, Arizona, April 2001.
- 1999 International Conference on Parallel and Distributed Computing Systems, Fort Lauderdale, Florida, August 1999.
- 1997 International Conference on Parallel and Distributed Computing Systems, New Orleans, Louisiana, October 1997.
- 13th IEEE International Conference on Distributed Computing Systems, Pittsburgh, Pennsylvania, June 1993.
- 1992 International Conference on Parallel Processing, St. Charles, Illinois, August 1992.
- 1991 Computer Software and Applications Conference, Tokyo, Japan, September 1991.

- **Vice-Chair**, Chapter V - Computers, IEEE Southeast Michigan Chapter (IEEE/SEM), 1996 - 1998.

- **Review Panel Member**

- NSF/CISE review panels, 2007, 2006, 2005, 2000, 1999(2), 1997, 1995.

- NSF/DUE review panel, 1996.
- DOE HPCC review panel, 1995.
- **Referee** for the following journals: IEEE Transactions on Network and Service Management, IEEE Transactions on Computers, IEEE Transactions on Software Engineering, IEEE Transactions on Parallel and Distributed Systems, Communications of the ACM, ACM Computing Surveys, Software Practice and Experience, Journal of Parallel and Distributed Computing, Computer Systems in Engineering, Information Processing Letters, Parallel Processing Letters, Journal of Computer Simulation, Parallel Computing, Computer Communications. Also a referee for many conferences in addition to program committee memberships.
- **Individual Reviewer** of research proposals to NSF, ARO, DOE, and the Swedish Research Council for Engineering Sciences.
- **Book Reviewer** for IEEE Computer Society Press and several other publishers.
- **Member**, IEEE Computer Society, ACM.

University Committee Service

- Engineering College Advisory Council (elected), 2006-2007 (Secretary), 2005-2006 (Secretary).
- CSE Chair Search Committee (elected), 2006-2007, 1994-1995.
- CSE Faculty Search Committee (elected), 2005-2006 (Chair), 2002-2003 (Chair), 2000-2001, 1999-2000, 1996-1997.
- CSE Graduate Studies and Research Committee, 2008-2010, 2006-2008 (Chair), 2005-2006, 2000-2003, 1991-1992 (secretary).
- CSE Department Advisory Committee (elected), 2001-2003, 1996-1997.
- CSE Computing Environment Committee, 2003-2004, 1999-2000, 1996-1998 (chairperson), 1995-1996 (secretary), 1992-1994, 1990-1991 (secretary).
- Graduate Recruitment Committee, 2000-2001.
- CSE Qualifying Exam Committee 2000-2001, 1999-2000 (chairperson), 1997-1998, and various qualifier subcommittees (1992-1997).
- CSE Space Committee, 1996-1997.
- CSE Colloquium Committee Chair, 1995-1996, 1993-1994.
- CSE Awards Committee, 1994-1995.
- Engineering College Computer Engineering Task Force, 1994 - 2001.
- Engineering College Computer Engineering Faculty Committee, 1990 - 1992.
- Engineering College Wireless Infrastructure Committee, 2000 - 2002.
- University Academic Council / Faculty Council (elected), 1994-1996.
- University Hearing Board (elected), 1993-1995.

Invited Talks, Exhibits, and Other Presentations

- Digital Evolution of Robust, Self-Adaptive Distributed Systems, NSF IUCRC Kickoff Meeting, Crystal City, Virginia, October 2007.
- Digital Evolution of Robust and Resilient Software for Distributed Systems, CSE Graduate Seminar, East Lansing, Michigan, September 2007.
- Directed Evolution of Communication and Cooperation in Digital Organisms, poster presentation, European Conference on Artificial Life (ECAL), Lisbon, Portugal, September 2007.
- Self-Adaptive Software Technologies for High-Assurance Systems, College of Engineering Seminar, East Lansing, Michigan, October 2006
- Evolution of Adaptive Sleep Response in Digital Organisms, poster presentation, European Conference on Artificial Life (ECAL), Lisbon, Portugal, September 2007.
- High-Assurance Autonomic Systems: RAPIDware and Follow-on Projects, Motorola Labs, Schaumburg, Illinois, August 2006
- The Role of Transparency in Autonomic Cyberinfrastructure, IBM Watson Research Center, Hawthorne, New York, March 2006
- Dynamic Adaptation for Autonomic Distributed Computing, invited presentation, Motorola Labs, Schaumburg, Illinois, July 2005.
- RAPIDware Project Overview and Status, ONR site visit, East Lansing, Michigan, October 2005.
- University Cyberinfrastructure: Pervasive, Sustainable, Autonomic, Evolvable, presented at MSU Cyberinfrastructure Workshop, East Lansing, Michigan, February 2005.
- RAPIDware: Component-Based Development of Adaptive and Dependable Middleware, DoD Workshop on Critical Infrastructure Protection, Annapolis, Maryland, August 2004.
- Generation of Self-Optimizing Wireless Network Applications, poster presentation, International Conference on Autonomic Computing (ICAC), New York, May 2004.
- Supporting Unanticipated Adaptation in Mobile Computing Systems, invited seminar, Department of Computer Science and Engineering, University of Minnesota, Minneapolis, Minnesota, December 2003.
- Support for Run-Time Adaptation in RAPIDware, invited seminar, Department of Computer Science and Engineering, University of Notre Dame, South Bend, Indiana, September 2003.
- RAPIDware: Adaptive Middleware for Critical Infrastructure Protection, MSU Cybersecurity Workshop, East Lansing, Michigan, November 2002.
- RAPIDware: Design of Adaptive Software for “Always-On” Systems, invited seminar, U.S.-European Union Workshop on Critical Infrastructure Protection, Lansdowne, Virginia, September 2002.
- MetaSockets: Run-Time Support for Adaptive Communication Services, poster presentation, International Symposium on Distributed Objects and Applications, Irvine, California, October 2002.
- Issues in the Design of Middleware for Mobile Computing Systems, invited seminar, Strategic Workshop on Middleware for Mobile Systems, jointly sponsored by the European Research Council on Informatics and Mathematics and the U.S. National Science Foundation, Vienna, Austria, July 2002.

- Design and Use of Adaptive Components in RAPIDware, invited seminar, Department of Computer Science, University of Illinois, Urbana, Illinois, April 2002.
- Design and Use of Adaptive Components in RAPIDware, invited seminar, Department of Computer Science, Purdue University, West Lafayette, Indiana, April 2002.
- RAPIDware: Adaptive Middleware for Mobile Computing, invited seminar, Department of Computer Science Indiana University - Purdue University at Indianapolis, Indianapolis, Indiana, April 2002.
- RAPIDware: Adaptive Middleware for Multi-Party Applications, invited seminar, National Superconducting Cyclotron Laboratory, East Lansing, Michigan, October 2001.
- RAPIDware: Component-Based Development of Adaptive and Dependable Middleware, ONR PI Meeting, Arlington, Virginia, July 2001.
- Design of Proxy Services for Heterogeneous Distributed Computing, invited seminar, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, February 2001.
- Adaptive Middleware for Heterogeneous Distributed Computing, invited seminar, Lucent Technologies, Holmdel, New Jersey, January 2001.
- Experimental Evaluation of Forward Error Correction on Multicast Audio Streams in Wireless LANs, poster presentation, ACM Multimedia Conference, Los Angeles, California, October 2000.
- Pocket Pavilion: Synchronous collaborative browsing for wireless handheld computers, poster presentation, IEEE International Conference on Multimedia and Expo, New York, July 2000.
- VGuide: Design and Performance Evaluation of a Synchronous Collaborative Virtual Reality Application, poster presentation, IEEE International Conference on Multimedia and Expo, New York, July 2000.
- Research Directions in Multi-Party Systems and Applications, invited seminar, Department of Electrical and Computer Engineering, Iowa State University, Ames, Iowa, April 1999.
- Research Directions in Multi-Party Systems and Applications, invited seminar, Lucent Technologies, Murray Hill, New Jersey, December 1998.
- Joint Research Exhibit of MSU Computer Science and Electrical Engineering Departments, IEEE Supercomputing'95, San Diego, California, December 1995.
- Collective Communication in Multicomputers and ATM Networks, invited seminar, Department of Electrical Engineering and Computer Engineering, Iowa State University, March 1995.
- Design of the ComPaSS Communications Library, Department of Energy Headquarters, Germantown, Maryland, March 1995.
- Cluster²: Parallel Data Clustering on a Workstation Cluster, poster presentation, IEEE Supercomputing'94, Washington, D.C., November 1994.

Personal Information

U.S. citizen. Born in 1960 and raised in St. Ansgar, Iowa. Married Betty H.C. Cheng in 1990. Three children: David (1996), Paul (2000), Sarah (2003).

References

Available upon request.