

Curriculum vitae for
JOHN B. CARTER

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RESEARCH INTERESTS

Distributed and parallel computing, wide area storage management, memory system design, and multiprocessor computer architecture.

EDUCATION

Ph.D., Rice University, 1993 (Computer Science)

Title of Dissertation: *Efficient Distributed Shared Memory Based on Multi-Protocol Release Consistency*

Thesis Advisor: Willy Zwaenepoel

M.S., Rice University, 1990 (Computer Science)

B.S., Rice University, 1986 (Electrical and Computer Engineering, Magna Cum Laude)

EXPERIENCE

1/1993-present *University of Utah, School of Computing*

Associate Director (8/05-present):

Help lead department of 32 tenure track, 6 research, and 3 clinical faculty. Initiated and manage outreach programs (e.g., industry affiliates, advisory board, technology commercialization, fund raising, and outreach e-mail lists/website).

Associate Professor (8/00-present)/ **Assistant Professor** (1/93-7/00):

Research: High performance, high availability WAN replication mechanisms (*Khazana*, *Swarm*). Securely harvesting idle WAN client resources (*Collective*). Smart memory hardware that dramatically improves performance (*Avalanche*, *Impulse*) and scales to 1000+ processor systems (*Ultraviolet*).

Publications: 11 journal articles, 3 patents (1 issued, 2 pending), 26 conference papers, 14 workshop papers, and 3 book chapters.

Funding: Over \$5.5 million as PI, \$14 million as co-PI or collaborator.

Teaching: 6 PhD and 7 MS graduates, 6 new courses, course evals in top quartile of department, 4 dean's letters, "Most Outstanding Teacher" award (2000).

4/2002-12/2002 **Visiting Researcher**, *IBM Austin Research Laboratory*

4/2002-12/2002 **Visiting Associate Professor**, *The University of Texas at Austin*

12/1995-12/1998 **Chief Scientist**, *MangoSoft Corporation* <http://www.mangosoft.com>

(Part-time 1/97-12/98)

Designed **Mango Medley**, a virtual file server created by pooling the resources of client PCs, and co-managed its development. Employed aggressive data replication and migration to provide fault tolerant performance comparable to the local file system. Won 1997 COMDEX award for Best Connectivity Software. Received 5 patents on Medley technology.

Summer 1994 **Visiting Scientist**, *Swedish Institute of Computer Science*

PUBLICATIONS

Journal Articles

1. Leveraging Wire Properties at the Microarchitecture Level. R. Balasubramonian, N. Muralimanohar, K. Ramani, L. Cheng, and J. Carter. *IEEE Micro*, Vol. 26, No. 6, November/December 2006.
2. Efficient Address Remapping in Distributed Shared-Memory Systems. L. Zhang and J. Carter. In the *ACM Transactions on Architecture and Compiler Optimization (TACO)*, Vol. 3, Issue 2, pp. 209-229, June 2006.
3. Fast Synchronization on Shared-Memory Multiprocessors: An Architectural Approach. Z. Fang, L. Zhang, J. Carter, L. Cheng, and M. Parker. In the Special Issue of the *Journal of Parallel and Distributed Computing* on the Design and Performance of Networks for Super-, Cluster-, and Grid-Computing. Vol. 65, No. 10, pp. 1158-1170, October 2005.
4. Scalable Barriers for Large-scale Shared Memory Multiprocessors. Z. Fang, L. Zhang, J. Carter, and M. Parker. In the *International Journal of High Performance Computing and Networking*, Vol. 1, No. 1/2/3, pp. 33-42, 2004.
5. A Cost Model for Integrated Restructuring Optimizations. B. Chandramouli, W.C. Hsieh, J.B. Carter, and S.A. McKee. In the *Journal on Instruction-Level Parallelism*, Vol. 5, August 2003.
6. Restructuring Computations for Temporal Data Cache Locality, V.K. Pingali, S.A. McKee, W.C. Hsieh and J.B. Carter. *International Journal on Parallel Processing*, Vol. 31, No. 4, August 2003, pp. 305-338.
7. The Impulse Memory Controller, L. Zhang, Z. Fang, M.A. Parker, B.K. Mathew, L. Schaelicke, J.B. Carter, W.C. Hsieh, and S.A. McKee. *IEEE Transactions on Computers*, Vol. 50, No. 11, pp. 1117-1132, November 2001.
8. Impulse: Memory System Support for Scientific Applications, J.B. Carter, W. Hsieh, L. Stoller, M. Swanson, L. Zhang, and S.A. McKee, *Journal of Scientific Programming*, Vol. 7, No. 3-4, pp. 195-209, 1999.
9. An Argument for Simple COMA, A. Saulsbury, T. Wilkinson, J.B. Carter, and A. Landin. *Journal of Future Generation Computer Systems*, Vol. 11, No. 6, October 1995.
10. Design of the Munin Distributed Shared Memory System, J.B. Carter. *Journal of Parallel and Distributed Computing*, Vol. 29, Number 2, pp. 219-227, September 1995.
11. Techniques for Reducing Consistency-Related Communication in Distributed Shared Memory Systems, J.B. Carter, J.K. Bennett and W. Zwaenepoel. *ACM Transactions on Computer Systems*, Vol. 13, No. 3, pp. 205-243, August 1995.

Patents

1. Microarchitectural Wire Management for Performance and Power in Partitioned Architectures; U.S. Patent Application No. 20070192541; Inventors: Rajeev Balasubramonian, Liqun Cheng, John Carter, Naveen Muralimanohar, and Karthik Ramani. Submitted August 16, 2007.

2. Apparatus and Method of Controlling Data Sharing on a Shared Memory Computer System; U.S. Patent Application No. 2006025554; Inventors: John Carter, Randal S. Passint, Liqun Cheng, and Donglai Dai. Submitted November 23, 2006.
3. Node Synchronization for Multiprocessor Computer Systems; Inventors; U.S. Patent Application No. 20060242308; John Carter, Randal S. Passint, Donglai Dai, and Zhen Fang. Submitted October 26, 2006.
4. System and Method for Performing Address Translation in a Computer System; U.S. Patent No. 7,181,589; Inventors: Steven C. Miller, Martin M. Deneroff, Curt F. Schimel, J. Carter, Lixin Zhang, Michael A. Parker. Issued February 20, 2007.
5. Shared Memory Computer Networks; U.S. Patent No. 6,148,377. Inventors: J. Carter, S. Davis, D. Dietterich, S. Frank, R. Phillips, J. Woods, D. Porter, and H. Lee. Issued November 14, 2000.
6. Shared Client-side Web Caching Using Globally Addressable Memory; U.S. Patent No. 6,026,474. Inventors: J.B. Carter, S.H. Davis, D.J. Dietterich, S.J. Frank, and H.S. Lee. Issued February 15, 2000.
7. Remote Access and Geographically Distributed Computers in a Globally Addressable Storage Environment; U.S. Patent No. 5,987,506. Inventors: J.B. Carter, S.H. Davis, and S.J. Frank. Issued November 16, 1999.
8. Structured Data Storage Using Globally Addressable Memory; U.S. Patent No. 5,918,229. Inventors: S.H. Davis, J.B. Carter, S.J. Frank, H.S. Lee, and D.L. Dietterich. Issued June 29, 1999.
9. System and Method for Providing High Availability Data Storage Using Globally Addressable Memory; U.S. Patent No. 5,909,540. Inventors: J.B. Carter, S.H. Davis, D.L. Dietterich, S.J. Frank, R.S. Phillips, J. Woods, D. Porter, and H.S. Lee. Issued June 1, 1999.

Refereed Conference Papers

1. Active Memory Operations. Z. Fang, L. Zhang, J. Carter, A. Ibrahim, and M. Parker. In the *Proceedings of the 21st ACM International Conference on Supercomputing*, June 2007.
2. An Adaptive Cache Coherence Protocol Optimized for Producer-Consumer Sharing. L. Cheng, J. Carter, and D. Dai. In the *Proceedings of the 13th International Symposium on High Performance Computer Architecture (HPCA)*, February 2007.
3. Interconnect-Aware Coherence Protocols for Chip Multiprocessors. L. Cheng, N. Muralimanohar, K. Ramani, R. Balasubramonian, and J. Carter. In the *Proceedings of the International Symposium on Computer Architecture (ISCA)*, pp. 339-351, June 2006.
4. Program Phase Detection and Exploitation, C. Ding, S. Dwarkadas, M.C. Huang, K. Shen, and J.B. Carter. In the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, April 2006.
5. Fast Barriers for Scalable ccNUMA Systems L. Cheng and J.B Carter, In the *Proceedings of the International Conference on Parallel Processing (ICPP'05)*, pp. 241-250, June 2005.
6. Flexible Consistency for Wide Area Peer Replication. S. Susarla and J.B Carter, In the *Proceedings of the International Conference on Distributed Computing Systems (ICDCS'05)*, pp. 199-208, June 2005.

7. Highly Efficient Synchronization Based on Active Memory Operations. L. Zhang, Z. Fang, and J.B. Carter, In the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, April 2004.
8. A Novel 32-bit Scalable Multiplier Architecture. Y. Kolla, Y.-B Kim, and J.B. Carter, In the *Proceedings of the Great Lakes Symposium on VLSI*, pp. 241-244, April 2003.
9. Computation Regrouping: Restructuring Programs for Temporal Data Cache Locality. V.K. Pingali, S.A. McKee, W.S. Hsieh, and J.B. Carter. In the *Proceedings of the International Conference on Supercomputing (ICS '02)*, pp. 252-261, June 2002. *Best student paper award*.
10. A Cost Framework for Evaluating Integrated Restructuring Optimizations, B. Chandramouli, J.B. Carter, W.C. Hsieh, and S.A. McKee. In the *Proceedings of the International Conference on Parallel Architectures and Compilation Techniques (PACT '01)*, pp. 131-140, September 2001.
11. Reevaluating Online Superpage Promotion with Hardware Support, Z. Fang, L. Zhang, J.B. Carter, S.A. McKee, and W.C. Hsieh. In the *Proceedings of the Seventh International Symposium on High Performance Computer Architecture*, PP. 63-72, January 2001.
12. Algorithmic Foundations for a Parallel Vector Access Memory System, B.K. Mathew, S.A. McKee, J.B. Carter, and A.L. Davis. In the *Proceedings of the 12th ACM Symposium on Parallel Algorithms and Architectures*, pp. 156-165, July 2000.
13. Online Superpage Promotion Revisited, Z. Fang, L. Zhang, J.B. Carter, S.A. McKee, and W.C. Hsieh, In the *Proceedings of the International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2000)*, pp. 114-115, June 2000.
14. Design of a Parallel Vector Access Unit for SDRAM Memory Systems, B.K. Mathew, S.A. McKee, J.B. Carter, and A. Davis. In the *Proceedings of the Sixth International Symposium on High Performance Computer Architecture*, pp. 39-48, January 2000.
15. Memory System Support for Image Processing, L. Zhang, J.B. Carter, W. Hsieh, and S.A. McKee. In the *Proceedings of the 1999 International Conference on Parallel Architectures and Compilation Techniques*, pp. 98-107, October 1999.
16. Impulse: Building a Smarter Memory Controller, J.B. Carter, W.C. Hsieh, L.B. Stoller, M.R. Swanson, L. Zhang, E.L. Brunvand, A. Davis, C.-C. Kuo, R. Kuramkote, M.A. Parker, L. Schaelicke, and T. Tateyama. In the *Proceedings of the Fifth International Symposium on High Performance Computer Architecture*, pp. 70-79, January 1999.
17. MP-LOCKS: Replacing H/W Synchronization Primitives with Message Passing, C.-C. Kuo, J.B. Carter, and R. Kuramkote. In the *Proceedings of the Fifth International Symposium on High Performance Computer Architecture*, pp. 284-288, January 1999.
18. Design Alternatives for Shared Memory Multiprocessors, J.B. Carter, C.-C. Kuo, R. Kuramkote, and M. Swanson. In the *Proceedings of the Fifth International Conference on High Performance Computing (HiPC '98)*, pp. 41-50, December 1998.
19. AS-COMA: An Adaptive Hybrid Shared Memory Architecture, C.-C. Kuo, J.B. Carter, R. Kuramkote, and M. Swanson. In the *Proceedings of the 1998 International Conference on Parallel Processing (ICPP'98)*, pp. 207-216, August 1998.
20. Increasing TLB Reach Using Superpages Backed by Shadow Memory, M. Swanson, L. Stoller, and J.B. Carter. In the *Proceedings of the 25th Annual International Symposium on Computer Architecture*, pp. 204-213, June 1998.

21. Khazana: An Infrastructure for Building Distributed Services, J.B. Carter, A. Ranganathan, and S. Susarla. In the *Proceedings of the 18th Annual International Conference on Distributed Computing Systems*, pp. 562-571, May 1998.
22. An Argument for Simple COMA, A. Saulsbury, T. Wilkinson, J.B. Carter, and A. Landin. In the *Proceedings of the First International Symposium on High-Performance Computer Architecture Conference*, pp. 276-285, January 1995. *Award paper*.
23. Network Multicomputing Using Recoverable Distributed Shared Memory, J.B. Carter, A. Cox, S. Dwarkadas, E. Elnozahy, D. Johnson, P. Keleher, S. Rodrigues, W. Yu, and W. Zwaenepoel. In the *Proceedings of COMPCON '93*, pp. 519-527, February 1993.
24. Implementation and Performance of Munin, J.B. Carter, J.K. Bennett and W. Zwaenepoel. In *Proceedings of the Thirteenth Symposium on Operating Systems Principles*, pp. 152-164, October 1991.
25. Adaptive Software Cache Management for Distributed Shared Memory Architectures, J.K. Bennett, J.B. Carter, and W. Zwaenepoel. In *Proceedings of the 17th International Symposium on Computer Architecture*, pp. 125-135, May 1990.
26. Munin: Distributed Shared Memory Based on Type-Specific Memory Coherence, J.K. Bennett, J.B. Carter, and W. Zwaenepoel. In *Proceedings of the 1990 Conference on the Principles and Practices of Parallel Programming*, pp. 168-176, March 1990.
27. Optimistic Implementation of Bulk Data Transfer Protocols, J.B. Carter and W. Zwaenepoel. In *Proceedings of the 1989 Sigmetrics Conference*, pp. 61-69, May 1989.

Refereed Workshop Papers

1. Perceptron-based Coherence Predictors. D. Ghosh, J.B. Carter, and H. Duame. In the *Proceedings of the 2nd Workshop on Chip Multiprocessor Memory Systems and Interconnects (CMP-MSI)*, June 2008.
2. Write-Update Optimizations for CC-NUMA Systems. L. Cheng and J.B. Carter. In the *Proceedings of the 11th Workshop on Computer Architecture Evaluation Using Commercial Workloads (CAECW-11)*, February 2008.
3. Wire Management for Coherence Traffic in Chip Multiprocessors. L. Cheng, N. Muralimanohar, K. Ramani, R. Balasubramonian, and J.B. Carter. In the *Proceedings of the 6th Workshop on Complexity-Effective Design (WCED)*, June 2005.
4. Safely Harnessing Wide Area Surrogate Computing -or- How to Avoid Building the Perfect Platform for Network Attacks, S. Goyal and J.B. Carter. In the *Proceedings of the First Workshop on Real, Large Distributed Systems (WORLDS 2004)*, December 2004.
5. A Lightweight Secure Cyber Foraging Infrastructure for Resource-Constrained Devices, S. Goyal and J.B. Carter. In the *Proceedings of the Sixth Workshop on Mobile Computing Systems and Applications*, December 2004.
6. Super-Fast Active Memory Operations-Based Synchronization, L. Zhang, Z. Fang, J.B. Carter, and M.A. Parker, in the *Proceedings of the 2nd International Workshop on Hardware/Software Support for High Performance Scientific and Engineering Computing*, September 2003.
7. Memory System Support for Dynamic Cache Line Assembly, L. Zhang, V.K. Pingali, B. Chandramouli, and J.B. Carter, in the *Proceedings of the Second Workshop on Intelligent Memory Systems*, November 2000.

8. Pointer-Based Prefetching within the Impulse Adaptable Memory Controller: Initial Results, L. Zhang, S.A. McKee, W.C. Hsieh, and J.B. Carter, in the *Proceedings of the ISCA 2000 Workshop on Solving the Memory Wall Problem*, June 2000.
9. Supporting Multiple Coherence Protocols in Programmable Shared Memory Controllers, R. Kuramkote, J.B. Carter, and C.-C. Kuo. In the *Proceedings of the Eighth Workshop on Scalable Shared Memory Multiprocessors*, pp. 6-7, May 1999.
10. Supporting Persistent C++ Objects in a Distributed Storage System, A. Ranganathan, Y. Izrailevsky, S. Susarla, J. Carter, and G. Lindstrom. In the *Proceedings of the 1999 Workshop on Compiler Support for Systems Software*, pp. 64-71, May 1999.
11. Keeping Distributed Memory Simple, Yet Efficient. M. Swanson, L. Stoller, and J. Carter. In the *Proceedings of Third International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS '98)*, pp. 2-13, April 1998. *Invited Presentation*.
12. Distributed Shared Memory: Where We Are and Where We Should Be Headed, J.B. Carter, D. Khandekar and L. Kamb. In the *Proceedings of the Fifth Workshop on Hot Operating Systems (HotOS V)*, pp. 119-122, May 1995.
13. FLEX: A Tool for Building Efficient and Flexible Systems, J.B. Carter, B.A. Ford, M. Hibler, R. Kuramkote, J. Law, J. Lepreau, D.B. Orr, L. Stoller, and M. Swanson. In the *Proceedings of the Fourth Workshop on Workstation Operating Systems*, pp. 198-202, October 1993. *Highest rated paper*.
14. Distributed Shared Memory: Experience with Munin, J. Bennett, J.B. Carter, A. Cox, D. Johnson, M. Elnozahy, and W. Zwaenepoel. In the *Proceedings of the Fifth ACM SIGOPS Workshop on Models and Paradigms for Distributed Systems Structuring*, September 1992.
15. Distributed Shared Memory: Experience with Munin, J.K. Bennett, J.B. Carter, A.L. Cox, E.N. Elnozahy, D.B. Johnson, P. Keleher, and W. Zwaenepoel. In the *Proceedings of the European SIGOPS Workshop*, July 1992.
16. Distributed Operating Systems Based on a Protected Global Virtual Address Space, J.B. Carter, A. Cox, D. Johnson, and W. Zwaenepoel. In the *Proceedings of the Third Workshop on Workstation Operating Systems*, May 1992.

Archival Book Chapters

1. Memory System Support for Irregular Applications, J.B. Carter, W. Hsieh, M. Swanson, L. Zhang, A. Davis, M. Parker, L. Schaelicke, L. Stoller, and T. Tateyama. In *Languages, Compilers and Run-Time Systems for Scalable Computers*, D. O'Hallaron (editor), Springer-Verlag Lecture Notes in Computer Science 1511, pp. 17-26, 1998.
2. Toward Large-Scale Shared Memory Multiprocessors, J.K. Bennett, J.B. Carter, and W. Zwaenepoel. In *Scalable Shared Memory Multiprocessing*, M. Dubois and S. Thakkar (editors), Kluwer Academic Publishers, pp. 316-325, 1991.
3. Munin: Distributed Shared Memory Using Multi-Protocol Release Consistency, J.B. Carter, J.K. Bennett and W. Zwaenepoel. In *Operating Systems of the 90s and Beyond*, A.I. Karshner and J. Nehmer (editors), Springer-Verlag Lecture Notes in Computer Science 563, pp. 56-60, 1991.

RESEARCH AWARDS

Principal Investigator

Title of Project: Making Utah a Digital Media Powerhouse
Supporting Agency: State of Utah, USTAR program
Total Costs: \$2,500,000
Duration: July 2008- June 2013

Title of Project: Improving Memory Power and Performance for Multicore Processors
Supporting Agency: National Science Foundation
Total Costs: \$300,000
Duration: May 2007 - April 2010

Title of Project: Improving Memory Systems Performance for Large Scale Shared Memory Multiprocessors
Supporting Agency: SGI/National Security Agency
Total Costs: \$540,256
Duration: June 2003 - December 2005

Title of Project: System Infrastructure for Pervasive Computing
Supporting Agency: Univ. of Utah Research Committee
Total Costs: \$30,000
Duration: September 2003 - August 2004

Title of Project: Ultraviolet
Supporting Agency: SGI/DARPA
Total Costs: \$500,000
Duration: June 2002 - June 2003

Title of Project: Adaptive Structure Aware Memory Systems
Supporting Agency: Advanced Research Projects Agency (DARPA)
Total Costs: \$4,343,757
Duration: March 1998 - December 2002

Title of Project: Investigating a Hybrid Function and Data Shipping Environment
Supporting Agency: National Science Foundation
Total Costs: \$100,000
Duration: August 1993 - January 1997

Title of Project: Using UCB Videos to Improve Computer Science Education
Supporting Agency: University of Utah
Total Costs: \$680
Duration: September 1994 - December 1994

Co-Principal Investigator

Title of Project: Program Phase Detection and Exploitation
Supporting Agency: National Science Foundation
Total Costs: \$100,000 (subcontract of \$520,000 contract)
Principal Investigator: Chen Ding (University of Rochester)
Duration: July 2005 - June 2009

Title of Project: Communication and Memory Architectures
for Scalable Parallel Computing
Supporting Agency: Advanced Research Projects Agency (ARPA)
Total Costs: \$4,733,290
Duration: November 1994 - March 1998
Principal Investigator: Al Davis

Title of Project: Fast and Flexible Mach-based Systems
Supporting Agency: Advanced Research Projects Agency (ARPA)
Total Costs: \$4,104,092
Duration: August 1994 - December 1998
Principal Investigator: Jay Lepreau

Faculty Associate

Title of Project: Utah's Engineers: A Statewide Initiative
Supporting Agency: National Science Foundation
Total Costs: Approx. \$1,500,000
Duration: June 2007 - June 2008
Principal Investigator: Cynthia Furse

Title of Project: A Laboratory Workbench for Security Research
Supporting Agency: National Science Foundation
Total Costs: \$1,466,666
Duration: July 2005 - June 2008
Principal Investigator: Jay Lepreau

Title of Project: Mach Kernel and IDL Infrastructure for Security
Supporting Agency: Advanced Research Projects Agency (ARPA)
Total Costs: \$2,066,266
Duration: July 1996 - June 1999
Principal Investigator: Jay Lepreau

Gifts

Gift Provider: Hewlett-Packard Corporation
Gift Amount: \$25,000
Date: November 2000

GRADUATE STUDENTS ADVISED

Graduated

Student	Level	Graduation	Employment
Liqun Cheng	Ph.D.	2007	Intel
<i>Research area:</i> Multiprocessor memory system design.			
Zhen Fang	Ph.D.	2006	Intel
<i>Research area:</i> Active (smart) memory systems.			
Sai Susarla	Ph.D.	2005	Network Appliances
<i>Research area:</i> Configurable consistency for wide-area caching systems.			
Lixin Zhang	Ph.D.	2002	IBM Research
<i>Research area:</i> Supporting vector-style gather operations on conventional systems.			
Ravindra Kuramkote	Ph.D.	2002	Hewlett-Packard
<i>Research area:</i> Multiprotocol DSM hardware for commodity-based multiprocessors.			
Chen-Chi Kuo	Ph.D.	1999	Intel
<i>Research area:</i> System support for scalable multiprocessor architectures.			
Yury Izrailevsky	M.S.	2005	Yahoo!
<i>Research area:</i> Wide area object-oriented distributed systems.			
Arjun Dutt	M.S.	2002	SUN
<i>Research area:</i> Circuit design for a smart memory controller.			
Bharat Chandramouli	M.S.	2001	Intel
<i>Research area:</i> Cost functions and compiler support for vector-style applications.			
Venkata Pingali	M.S.	2001	USC
<i>Research area:</i> Applying memory optimizations to vector-style applications.			
Linus Kamb	M.S.	1998	Arkona Systems
<i>Research area:</i> Efficient distributed interprocess communication.			
Dilip Khandekar	M.S.	1996	Network Appliances
<i>Research area:</i> Portable and efficient software distributed shared memory.			
Paul Roberts	M.S.	1995	IBM - Colorado Springs
<i>Research area:</i> Efficient debugging of dynamic memory-related software bugs.			

Current

Student	Level	Graduation (estimated)
Sachin Goyal	Ph.D.	Fall 2007
<i>Research area:</i> Using secure collectives to harvest idle untrusted Internet client resources		
Devyani Ghosh	Ph.D.	Spring 2011
<i>Research area:</i> Using machine learning techniques to improve memory power and performance in chip multiprocessors		

Member of the dissertation/thesis committees of an additional 18 Ph.D. and 16 M.S. students.

PROFESSIONAL SERVICE

Advisory Panels

Member of the Technical Advisory Board of Katana Corporation, January 2003-present.

Member of the Technical Advisory Board of Revivio Corporation, November 2002-present.

Member of NSF Research Initiation Award Review Panel, March 1994

Member of Joint NSF/ARPA/NIH Digital Libraries Review Panel, April 1994

Euro-Par Conference Advisory Board, 1995-present.

Program Committees

HPCA '08 (International Conf. on High-Performance Computer Architecture), *General Chair*

SUPERCOMPUTING '07, *Area Chair*

ICPP '06 (International Conference on Parallel Processing), *Area Chair*

ICDCS '06 (International Conference on Distributed Computing Systems)

WMPI '06 (Workshop on Memory Performance Issues), *Organizer and Program Co-Chair*

PPHEC '05 (Workshop on Productivity and Performance in High-End Computing)

HPCA '05 (International Symposium on High Performance Computer Architecture)

PACT '05 (International Conference on Parallel Architectures and Compilation Techniques)

ISPASS '04 (International Symposium on Performance Analysis of Systems and Software)

ASPLOS '04 (Int'l Symp. on Arch. Support for Prog. Languages and Operating Systems)

WMPI '04 (Workshop on Memory Performance Issues), *Organizer and Program Co-Chair*

PPHEC '04 (Workshop on Productivity and Performance in High-End Computing)

PACT '03 (International Conference on Parallel Architectures and Compilation Techniques)

HPCA '02 (International Symposium on High Performance Computer Architecture)

ICPP '01 (International Conference on Parallel Processing)

HPCA '01 (International Symposium on High Performance Computer Architecture)

IMS '00 (Second Workshop on Intelligent Memory Systems)

PPoPP '99 (ACM Symposium: Principles and Practices of Parallel Programming), May 1999.

PODC '99 (ACM Symposium: Principles of Distributed Computing), May 1999.

ICDCS '99 (International Conference on Distributed Computing Systems), May 1999.

HIPS '97-99 (High-level Parallel Programming Models and Supportive Environments)

IEEE Hot Topics in Operating Systems (HotOS), May 1996 and 1997

EUROPAR '95, August 1995

Fourth Workshop on Workstation Operating Systems, October 1993

Refereeing

Reviewer for fifteen journals (e.g., ACM Transactions on Computer Systems and IEEE IEEE Transactions on Parallel and Distributed Computing) and dozens of conferences and workshops.

UNIVERSITY SERVICE

Committees

Dates	Committee
2007-present	University Technology Commercialization Advisory Committee
2005-present	School of Computing Executive Committee
2003-present	Outreach Committee (chair, founder)
2003-2004	Chair of School of Computing RPT Committee
1998-2002	College Council
1994-1997	Computer Facilities Committee
1993-1995,1996-2000	Faculty Recruiting Committee
1993-1995,1996-1999	Graduate Studies Committee
1992-1993	Undergraduate Committee

Curriculum Development

1. **CS 3960-02 (Industry Forum)**: This is a one-credit course in which industry leaders present their views on a topic of their choice to computer science students. Topics range from highly technical (e.g., applied machine learning and medical imaging) to career oriented (e.g., interviewing and how to build a successful startup). The course exposes students to “real world” issues that are not covered in a typical undergraduate curriculum.
2. **CS 5961 (Networked Game Design)**: Teaches distributed systems as motivated by network gaming. Covers distributed systems (e.g., concurrency, scalability, fault tolerance, and security) and game (e.g., latency compensation, cheating, and MMOs) issues. Projects begin with a client-server game and culminate with a latency-tolerant clustered MMO.
3. **CS 606/7460 (Distributed Systems)**: This course explores the principles and practices of distributed systems, including system organization (client-server, p2p, clusters), concurrency, resource management, scalability, pervasive systems, fault tolerance, and security. Groups of students design, implement, and evaluate a distributed system of their choosing.
4. **CS 673/6961 (Advanced Networking)**: This graduate-level course explored emerging networking technology and standards of the late 90s (Spring '95 and Spring '99). Topics included next generation routing and reservation protocols, high-speed (gigabit and beyond) technology, Internet services, mobile networking, multicast, multimedia, and security.
5. **CS 676 (Design and Evaluation of Advanced Computer Architectures)**: This course was a graduate-level special topics course that focused on performance modeling and evaluation. Topics included how to design effective and valid experiments, workload characterization, benchmarks, queueing theory, markov modeling, and simulation.
6. **CS 686-2 (High Tech Entrepreneurism)**: This one-time offering explored a mix of engineering and business students to the technical and business issues involved in creating a successful high-tech startup (co-taught with a professor of business).

Other Courses Taught

1. **CS 506/5460/6460 (Operating Systems)**
2. **CS 508/5480/6480 (Networking)**
3. **CS 507 (Compilers)**
4. **CS 7934 (Computer Systems Seminar)**