

CV: James P.G. Sterbenz

Research Expertise and Interests

Networking and communication among distributed systems and applications, particularly in new, challenging, and novel contexts and application scenarios:

- Survivable, resilient networks, disruption tolerant end-to-end protocols, and adaptive applications with inter-layer awareness and control loops
- High-speed networking and user-to-user communication, particularly with high bandwidth-x-delay products and delay tolerance (weak/episodic connectivity and satellite to interplanetary latencies)
- Active, cognitive, adaptive, programmable, and extensible network architectures and components; network processors and networked storage
- Ubiquitous and pervasive computing and mobile communication
- Heterogeneous end systems, network components, link and subnetwork types (including sensor/actuator nets, ubiquitous computing, and the wireless/optical interface) and their unification in the global information infrastructure for distributed applications
- Network signalling, monitoring, control, and management
- Resource tradeoffs between end / intermediate systems, and among memory, processing, communication bandwidth, energy consumption, and latency
- Scalable large systems of systems and their interactions, including networks, computer and switch architecture, operating systems, and applications
- The discovery and application of fundamental principles for systemic and systematic architecture, simulation, and design of distributed systems, networks, and protocols
- Education of students and young researchers through teaching, mentoring, and leadership in conferences, journals, and professional societies

Education

1986 – 1991 Washington University in St. Louis Missouri **D.Sc. in Computer Science**

Axon: A Host–Network Interface Architecture for Gigabit Communications

Axon was the first *zero-copy* host-network interface and uses distributed virtual shared memory over a wide area network for interprocess communication. The pipelined network interface includes a hardware implementation of integrated layer processing (layer smashing), as well as rate (flow) and error control. Axon was extensively simulated at 1 Gb/s, including the hardware error and flow control mechanisms at the gate level.

Advisor: Gurudatta M. Parulkar

Committee: David J. Farber, Jonathan Turner, Jerome R. Cox, Gary S. Delp, Martin Dubetz

1984 – 1986 Washington University in St. Louis Missouri **M.S. in Computer Science**

Design and Implementation of a 2x2 VLSI Fast Packet Switch Element

Creation of a cell library and custom VLSI design, implementation, and fabrication of a 2x2 switch element using the Mosis tool set for the Washington University broadcast packet switch.

Advisor: Jonathan Turner

Design and Implementation of a High-Level Job Scheduler for MVS

Designed a front-end scheduler that inserted programs into the proper MVS scheduler queues based on user requirement and administrative policy.

Advisor: Harold Mack

1982 – 1983 **University of Minnesota** **Minneapolis, Minnesota**
Graduate classes in computer architecture, operating systems, queueing theory

1981 **San Diego State University** **California**
Graduate classes in computer architecture

1976 – 1980 **Washington University in St. Louis** **Missouri**
B.S. in Electrical Engineering
B.S. in Computer Science
A.B. in Economics – minors in Anthropology and Asian Studies

1974 – 1975 **University of Missouri** **Columbia, Missouri**
Undergraduate classes in Chemical Engineering and Chemistry degree programs

**Professional
Experience**

2005 – present **University of Kansas, Lawrence, Kansas**
Associate Professor
Department of Electrical Engineering and Computer Science, School of Engineering
Communications and Networking Systems Laboratory, Information &
Telecommunication Technology Center
Research in survivable and disruption-tolerant networks.
Teaching graduate and undergraduate networking courses.

2004 – present **Lancaster University, UK**
Visiting Professor of Computing
Computing Department, Faculty of Applied Sciences
C-PI (with David Hutchison) of ResiliNets resilient and survivable networking
initiative: research in self-organisation and programmable networks for resilient and
autonomic networking.
Teaching advanced networking and Internet graduate and undergraduate courses.

2004 – 2005 **Northeastern University, Boston, Massachusetts**
Lecturer (part-time)
Telecommunication System Management program, College of Engineering
Teaching graduate data networking course.

2003 – 2005 **University of Massachusetts Amherst, Massachusetts**
Visiting Research Scientist
Computer Networks Research Group, Department of Computer Science
Research in end-to-end protocols for disruption-tolerant and sensor networks with
emphasis on delay/congestion/corruption discrimination and cross-layering.
Group leader and document editor, DARPA Strategic Networking research agenda
(NetVision), 2003–2004.

1999 – 2003 **BBN Technologies** **Cambridge, Massachusetts**
Senior Network Scientist
Responsible for development of new research agenda, both internally and in
conjunction with funding agency program managers; proposal writing in response to
solicitations, technical leadership and project management of funded research projects.

- Co-PI (with Alden Jackson), *Secure Environment for Network Control, Monitoring, and Management* (SENCOMM), DARPA ITO Active Networks program, 1999–2003. SENCOMM is an architecture and implementation of an active MEE (management execution environment) that provides the basis for

active network monitoring and control. SENCOMM has been deployed on the ABone and prototype MAAs (management active applications) include ABone monitoring, intrusion/anomaly detection, and multicast tree topology mapping/monitoring. Project collaboration with University of Kentucky, USC/ISI, Columbia University, and ETH Zürich.

- Group leader and document editor, *DARPA Strategic Networking* research agenda (NetVision), 2002–2003.
- Technical contributor, *Optical Transport Network Architecture and Cryptography* project, US Government project, 2003.
- Technical contributor, *Knowledge Plane* seedling project, DARPA IPTO, 2003.
- Member of *NewArch* project, DARPA ITO NGI, 2002–2003.
- PI, *Web VADE MECUM* (WVM), DARPA ITO WiaB program, 2001–2002. WVM is a prototype latency-aware web browser that estimates response time (based on various criteria including past history and current channel conditions) and colors links accordingly (red = slow, yellow = cached, green = recently cached or fast). Users can then explicitly determine fetch behaviour by right clicking (normal fetch from source, display cached, display cached and non-blocking fetch from source). WVM is targetted to weakly and episodically connected clients as well as very long latencies (e.g. interplanetary). WVM is a user directed application solution for DTNs that relies on knowledge of network conditions.
- PI, *Survivable Mobile Wireless Information Networks*, DARPA ATO SUMOWIN program, 2001–2002. SUMOWIN was a seedling program to help form a new DARPA program. We investigated a number of techniques for mobile wireless survivability summarized in the WiSe 2002 paper. Key concepts include forwarding even when an end-to-end path does not exist through the network (no routing convergence), and nodes physically transporting data (store-and-haul).
- PI, *Transport Protocol Mechanisms and TCP Enhancements for High-Speed Wireless Networks*, NASA GRC and ESTO, 2000–2002. We explored generic mechanisms for corruption/congestion discrimination and signalling, as well as two specific mechanisms for improving the performance of transport protocols in wireless networks: ETEN (explicit transport error notification) for which we simulated a theoretical performance bound and analysed several specific mechanisms; Swift Start in which we use capacity estimation and pacing to quickly open the TCP window while minimising burstiness and avoiding congestion.
- Technical lead for internal *Mobile Ubiquitous Computing and Communication* program development, including a systematic understanding of the protocols and algorithms needed for auto-configuration and self-organisation of mobile ad hoc networks, 1999-2001.
- Co-PI (with Martha Steenstrup), *Network Architectures for Unpiloted Combat Aerial Vehicles (UCAVs)*, ONR, 1999–2000.
- Technical Contributor and mentor to first-time PI (Rajesh Krishnan), *PetaWeb High-Speed Optical IP Infrastructure*, DARPA ITO NGI program (Nortel subcontract), 1999–2000. In this work we were concerned with the impact of the deployment of large densely connected optical backbones in the Internet, as part of the NGI NTONC program, and investigated the performance of TCP over a load reactive link (similar to a use-it-or-lose-it traffic class).
- Co-PI (with Rajesh Krishnan), *Generic Control Mechanism for Multihop Wireless Networks*, DARPA ITO GloMo program, 1999-2000. Collaboration with University of Texas.

1999 – 2002 **BBN Technologies** **Cambridge, Massachusetts**

Research Group Manager: Mobile, Wireless, and Active Networking

Line management of 8 research staff and research project management of projects described above (as well as some additional projects).

Project manager for

- DARPA ITO Active Networks SENCOMM, 1999–2002
- DARPA ITO WiaB WVM, 2001–2002
- DARPA ATO SUMOWIN, 2001–2002
- DARPA ATO SUO SAS (ITT subcontract), 2000
- DARPA ITO NGI PetaWeb, 1999–2000

- DARPA ITO GloMo
 - RAVEN (ITT subcontract) 1999–2000
 - GCM (with University of Texas at Dallas), 1999
- ONR UCAV
 - 6.1 routing algorithms, 1999–2000
 - 6.2 network architecture, 1999–2000
- NASA ESTO TCP, 2000–2002

1998 – 1999 **GTE Laboratories** **Waltham, Massachusetts**

Principal Member of Technical Staff

Principal Investigator of Internet Multimedia Services Project

Technical lead for research projects, internal funding proposals, and supervisor of one full time research staff and several interns.

- Designed and prototyped a session control architecture for location-independent heterogeneous personal communication. Users are able to communicate with one another by name (e.g. “call Alice”) without knowing any other details. A name database resolves to *user agents*, which serve as an individual’s point-of-presence in the network with knowledge of location and communication preferences and capabilities. The user agents negotiate to establish the communication session.
- Early participation in the CANES (composable active network elements) DARPA ITO Active Nets project with Georgia Tech.

1994 – 1997 **GTE Laboratories** **Waltham, Massachusetts**

Senior Member of Technical Staff

Project leader for Internet Multimedia Services Project.

- Lead research project in interactive hyperlinked multimedia streaming services using SMIL. Designed and prototyped multimedia services including video email.

Project member of Broadband Intelligent Networks Project.

1991 – 1994 **IBM HPCC and** **Milford, Connecticut**
IBM Research **Hawthorne, New York**

Advisory Engineer Scientist

High-speed network architecture and design.

- Architecture and protocol design for ATM over IBM Research plaNET/Orbit gigabit network that used variable size packets.
- Architecture and design of gigabit host–network interfaces for RS/6000 workstations.

1981 – 1984 **IBM** **Rochester, MN**

Engineer

System programmer and system administrator in Manufacturing Control Systems development group.

- Designed and implemented real-time extensions to MVS operating system to support process control.
- Systems programmer and administrator for several IBM mainframe computers supporting development and running the Rochester manufacturing plant.

1980 – 1981 **NCR** **San Diego, California**

Hardware Engineer

- Microcontroller design for NCR 8600 series mainframe computer

1976 – 1978 **Sterbenz & Associates** **St. Louis, Missouri**

Engineer

- Hardware and software design and implementation of 8080 and 8748 distributed system to maintain status of North St. Louis County Fire Protection District emergency equipment, including custom operating system for operator interaction and automatic update from mobile vehicles

Publications

Books

James P.G. Sterbenz, Samarath Bhattacharjee, and Douglas Maughan, editors, *Active Networks: Research and Architecture*, (in preparation)

James P.G. Sterbenz and Joseph D. Touch, *High Speed Networking: A Systematic Approach to High-Bandwidth Low-Latency Communication*, John Wiley Networking Council (A. Lyman Chapin technical editor), Apr. 2001

Edited Volumes

Naoki Wakamiya, Marcin Solarzski, and James Sterbenz, editors, *Active Networks: IFIP-TC6 5th International Working Conference, IWAN 2003*, LNCS 2982, Springer, Berlin, 2004

James Sterbenz, Osamu Takada, Christian Tschudin, and Bernhard Plattner, editors, *Active Networks: IFIP-TC6 4th International Working Conference, IWAN 2002*, LNCS 2546, Springer, Berlin, 2002

Joseph D. Touch and James P. G. Sterbenz, editors, *IFIP Protocols for High Speed Networks VI*, Kluwer Academic Publishers, Boston, 2000

Refereed Papers

Rajesh Krishnan, James P.G. Sterbenz, Wesley M. Eddy, Craig Partridge, and Mark Allman, “Explicit Transport Error Notification (ETEN) for Error-Prone Wireless and Satellite Networks”, *Computer Networks*, vol.46, #3, October 2004, pp. 343–362

Christoph Wirz, Regina Rosales Hain, Alden W. Jackson, Bernhard Plattner, and James P.G. Sterbenz, “Multicast Monitoring with SENCOMM”, *IFIP IWAN 2002 Poster Proceedings*, Zürich, December 2002

James P.G. Sterbenz, Rajesh Krishnan, Regina Rosales Hain, Alden W. Jackson, David Levin, Ram Ramanathan, and John Zao, “Survivable Mobile Wireless Networks: Issues, Challenges, and Research Directions”, *Proceedings of the ACM Wireless Security Workshop (WiSE) 2002 at MobiCom*, Atlanta GA, September 2002, pp. 31–40

Rajesh Krishnan, Mark Allman, Craig Partridge, James P.G. Sterbenz, and William Ivancic, "Explicit Transport Error Notification (ETEN) for Error-Prone Wireless and Satellite Networks – Summary", *NASA Earth Science Technology Conference (ESTC) 2002*, Pasadena CA, June 2002

Alden W. Jackson, James P.G. Sterbenz, Mathew N. Condell, and Regina Rosales Hain, "Active Monitoring and Control: The SENCComm Architecture and Implementation", *Proceedings of the DARPA Active Networks Conference and Exposition (DANCE) 2002*, San Francisco CA, June 2002, pp. 379–393

Rajesh Krishnan and James P.G. Sterbenz "TCP over Load-Reactive Links", *Proceedings of the IEEE 9th International Conference on Network Protocols (ICNP 2001)*, Riverside CA, November 2001, pp. 172–179

James P.G. Sterbenz and Rajesh Krishnan, *Multi-Modal Routing and Switch Node Architecture*, DARPA/DOE/NASA/NIST/NLM/NSF Workshop on New Visions for Large-Scale Networks: Research and Applications, Vienna VA, March 2001

Rajesh Krishnan, James P.G. Sterbenz, and A. Lyman Chapin, "Issues in Designing a PetaWeb-Based IP Infrastructure", *Proceedings of Networks 2000*, Toronto ON, September. 2000

James P.G. Sterbenz, Alden Jackson, Rajesh Krishnan, and Craig Partridge, *Smart Spaces Position Paper*, DARPA/NIST/NSF Workshop on Research Issues in Smart Computing Environments, College of Computing, Georgia Institute of Technology, Atlanta GA, July 1999

Ken Calvert, Samrat Bhattacharjee, Ellen Zegura, and James P.G. Sterbenz, "Directions in Active Networks", *IEEE Communications*, vol.36 #10, Oct. 1998, pp. 72–78

James P.G. Sterbenz and Gregory S. Lauer, "Session Control Issues for Gigabit Networks", *IEEE Gigabit Networking Workshop (GBN)*, (presentation and abstract), 1997

Jean-Paul Nussbaumer, Baiju V. Patel, Frank Schaffa, and James P.G. Sterbenz, "Networking Requirements for Interactive Video on Demand", *IEEE Journal on Selected Areas in Communications*, vol.13, #5, June 1995, pp.779–787

Gregory S. Lauer, James P.G. Sterbenz, and Israel Zibman, "An Architecture for Broadband Services", *Proceedings of IEEE Intelligent Networks (IN)'95*, Ottawa ON, May 1995

James P.G. Sterbenz and Gurudatta M. Parulker, "Design of a Gigabit Host–Network Interface", *Journal of High Speed Networking*, Vol.2 #1, IOS Press, Amsterdam, 1993, pp. 27–62

James P.G. Sterbenz, Anshul Kantawala, Milind Buddhikot and Gurudatta M. Parulker, "Hardware Based Error and Flow Control in the Axon Gigabit Host–Network Interface", *Proc. of IEEE INFOCOM'92*, Florence, May 1992, pp 282–293

James P.G. Sterbenz and Gurudatta M. Parulker, "Axon Host–Network Interface for Gigabit Communications", in *IFIP Protocols for High Speed Networks (P/HSN) II*, Palo Alto CA, Marjory Johnson, editor, Elsevier / North Holland 1991, pp. 211–236

James P.G. Sterbenz and Gurudatta M. Parulker, "Axon: Application-Oriented Lightweight Transport Protocol Design", *Proceedings of Tenth International Conference on Computer Communication (ICCC'90)*, New Delhi, November 1990, Narosa Publishing House, pp. 379–387

James P.G. Sterbenz and Gurudatta M. Parulkar, "Axon Network Virtual Storage for High Performance Distributed Applications", *Proceedings of IEEE 10th International Conference on Distributed Computing Systems (ICDCS)*, Paris, June 1990, pp 484–492

James P.G. Sterbenz and Gurudatta M. Parulkar, "Axon: A Distributed Communication Architecture for High-Speed Networking", *Proceedings of IEEE INFOCOM'90*, San Francisco CA, June 1990, pp. 415–425

Invited Papers

James P.G. Sterbenz, Bernhard Plattner, Bobby Bhattacharjee, Lukas Ruf, and Mattias Bosshardt, "Programmable Networks: Alternative Mechanisms and Design Choices", *Proceedings of the IFIP International Working Conference on Active Networks*, Lawrence, Kansas, October 2004, to appear

James P.G. Sterbenz, *Peer-to-Peer vs. the Internet: A Discussion on the Proper and Practical Location of Functionality*, Dagstuhl Seminar 04411, Service Management and Self-Organization in IP-based Networks, Wadern Germany, October 2004, <http://drops.dagstuhl.de/portals/04411/115>.

James P.G. Sterbenz, "Protocols for High-Speed Networks: A Brief Retrospective Survey of High-Speed Networking Research", *IFIP Protocols for High Speed Networks VII*, Georg Carle and Martina Zitterbart, editors, Springer, Berlin, 2002, pp. 243–265

Bernhard Plattner and James P.G. Sterbenz, "Mobile Wireless Active Networking: Issues and Research Agenda", *IEICE Workshop on Active Network Technology and Applications (ANTA) 2002*, Tokyo, March 2002, pp. 71–74

James P.G. Sterbenz, "Intelligence in Future Broadband Networks: Challenges and Opportunities in High-Speed Active Networking", *Proceedings of IEEE International Zürich Seminar on Broadband Communications (IZS 2002)*, Zürich, February 2002, pp. 2-1–2-7

Gregory D. Abowd and James P.G. Sterbenz, "Final Report on the Inter-Agency Workshop on Research Issues for Smart Environments", *IEEE Personal Communications*, vol.7 #5, October 2000, pp. 36–40

James P.G. Sterbenz, "Towards Gigabit Networking", in *Towards Gigabit Networking*, IEE Digest No: 1996/118, 1996, pp. 1/1–1/5

James P.G. Sterbenz, Henning G. Schulzrinne, and Joseph D. Touch, "Report and Discussion on the IEEE ComSoc TCGN Gigabit Networking Workshop 1995", *IEEE Network*, vol.9 #4, July/August 1995, pp. 9–21

James P.G. Sterbenz, "Protocols for High Speed Networks: Life After ATM?", in *IFIP Protocols for High Speed Networks IV*, Gerald Neufeld and Mabo Ito, editors, Chapman & Hall, London, 1995, pp. 3–18

Selected Technical Reports

Alden W. Jackson, James P.G. Sterbenz, Yechiam Yemini, and Alexander V. Konstantinou, *Management Architecture Framework for Active Networks*, BBN Technical Report 8386, January 2004

Craig Partridge, James P.G. Sterbenz, Robert J. Bobrow, and Mark H. Burstein, *Cognition in Forward Networks*, BBN Technical Report 8375, October 2003

Christoph Wirz, James P.G. Sterbenz, Matthias Bossardt, and Bernhard Plattner, *Active Network Multicasting and Tree Monitoring with SENCOMM*, Diploma Thesis DA-2002.29, ETH Zürich, BBN Technical Report 8358, November 2002

James P.G. Sterbenz, Tushar Saxena, and Rajesh Krishnan, *Latency-Aware Information Access with User-Directed Fetch Behaviour for Weakly-Connected Mobile Wireless Clients*, BBN Technical Report 8340, May 2002

Craig Partridge, Dennis Rockwell, Mark Allman, Rajesh Krishnan, and James P.G. Sterbenz, *A Swifter Start for TCP*, BBN Technical Report 8339, March 2002

Rajesh Krishnan, Mark Allman, Craig Partridge, and James P.G. Sterbenz, *Explicit Transport Error Notification (ETEN) for Error-Prone Wireless and Satellite Networks*, BBN Technical Report 8333, February/March 2002

Alden Jackson, James P.G. Sterbenz, Matthew N. Condell, Joel Levin, and David J. Waitzman, *SENCOMM Architecture*, BBN Technical Memo 1278, January 2001

Rajesh Krishnan, and James P.G. Sterbenz, *An Evaluation of the TSMA Protocol as a Control Channel Mechanism in MMWN*, BBN Technical Memo 1279, April 2000

James P.G. Sterbenz, Alden W. Jackson, and Matthew N. Condell, *Hyperactive Networking*, Active Networks Group Internet Draft, 1 April 2000

Leonard Kleinrock, James P.G. Sterbenz, Nick Maxemchuck, Simon S. Lam, Henning Schulzrinne, and Peter Steenkiste, *The National Exchange for Networked Information Systems: A White Paper*, UCLA Computer Science technical report CSD-930039, November 1993

James P.G. Sterbenz, *Design and Implementation of a 2x2 VSLI Packet Switch Element*, Washington University Computer and Communications Research Center Technical Report WUCCRC-88-1, April 1988

Additional Contribution to Funding Agency Reports

IIIE: The Invisible Intelligent Information Exchange – A Ten Year Vision and Framework for Government-Sponsored Networking Research, lead editor and contributor 2002–2004, DARPA report, to appear.

NSF Wireless Networking Workshop Final Report, University of Kansas ITTC Technical Report ITTC-FY2004-TR-32950-01, 2004; report section editor and contributor; workshop presenter, Chicago IL, July 2003

Report of the ARPA/NSF Workshop on Research in Gigabit Networking, workshop participant and member of authoring committee, Washington DC, July 1994

Selected Additional Presentations

Keynote Addresses

Keynote Address: *Protocols for High-Speed Networks: A Brief Retrospective Survey of High-Speed Networking Research*, IEEE ICWLHN/ICN, Atlanta GA, August 2002

Closing address: *Protocols for High-Speed Networks: A Brief Retrospective Survey of High-Speed Networking Research*, IFIP/IEEE Protocols for High-Speed Networks, Berlin, April 2002

Keynote address: *Intelligence in Future Broadband Networks: Challenges and Opportunities in High-Speed Active Networking*, IEEE International Zürich Seminar on Broadband Communications (IZS 2002), Zürich Switzerland, February 2002

Keynote address: *Towards Gigabit Networking*, IEE Colloquium, Towards Gigabit Networking, Manchester UK, May 1996

Keynote address: *Protocols for High Speed Networks: Life After ATM?*, IFIP Protocols for High Speed Networks, Vancouver BC, August 1994

Other Invited Presentations

James P.G. Sterbenz, "Network Processors: Opportunity for Open, Programmable, Extensible, Adaptive, Active Networks?", *IEEE OpenSig 2002*, Lexington KY, October 2002

James P.G. Sterbenz, Chip Elliott, Craig Partridge, Jason Redi, and Ram Ramanathan, *Towards a Flexible and Adaptive MANET Network*, Office of the Secretary of Defense Seminar on MANET, Crystal City VA, September 2002

James P.G. Sterbenz, Chip Elliott, Craig Partridge, Jason Redi, and Ram Ramanathan, *Wideband RF in Mobile Wireless Networking*, presentation to the Defense Science Board, Alexandria VA, September 2002

Alden Jackson and James P.G. Sterbenz, *Active Network Monitoring and Control*, Dagstuhl Seminar on Active and Programmable Networks, Wadern Germany, February 2002

Bernhard Plattner and James P.G. Sterbenz, "Mobile Wireless Active Networking: Issues and Research Agenda", *DARPA Active Networks Next Generation Workshop*, Orlando FL, November 2001

James P.G. Sterbenz, Alden W. Jackson, Rajesh Krishnan, and Craig Partridge, *Network Protocols and Research Issues for Pervasive Computing*, OpenSig 2000, Napa CA, October 2000

Martha Steenstrup and James P.G. Sterbenz, *UCAV (Unpiloted Combat Arial Vehicle) Networking Technology*, presentation to the Naval Studies Board, Irvine CA, December 1999

Seminars and Colloquia

Survivable and Disruption-Tolerant Networking: Issues, Challenges, and Research Directions

University of Kansas ITTC Seminar, Dec. 2004

Universität Tübingen Computer Networks and Internet Seminar, Germany, Sep. 2004

KTH Royal Institute of Technology Network Systems Seminar, Stockholm, June 2004

Boston University ECE Seminar, April 2004

Survivable Mobile Wireless Networks: Issues, Challenges, and Research Directions

University of Massachusetts Computer Science Seminar, Amherst, April 2003

IEEE Boston Section Seminar, Verizon Laboratories, Waltham MA, December 2002

Northeastern University Telecommunications Seminar (inaugural), November 2002

University of Kentucky Computer Science Seminar, Lexington, October 2002

Latency Aware Information Access with User Directed Handling of Cache Misses

Fraunhofer FOKUS Seminar, Berlin, April 2002

IBM Research Seminar, Zürich, Switzerland, February 2002

University of Saarbrücken Seminar, Germany, February 2002

Computer Networks Div. Seminar, USC/ISI, Marina del Rey CA, November 2001

Computer Engineering Seminar, ETH Zürich, Switzerland, September 2001

Computer Networks Seminar, University of Bern, Switzerland, June 2001

Computer Science Seminar, University of Kentucky, Lexington, May 2001

Telematics Seminar, University of Karlsruhe, Germany, May 2001

Network Research Issues in Ubiquitous Computing, 25th anniversary of the

Washington University Computer Science Department, St. Louis MO, October 2000

Ubiquitous Computing and Smart Spaces: Research Issues and Problems

Computer Science Colloquium, University of Mass., Amherst, June 2000

Electrical Engineering Colloquium, ETH Zürich, Switzerland, October 1999

SENCOMM: Smart Environment for Network Control, Monitoring and Management
Computer Science Colloquium, Georgia Tech College of Computing, April 2000

Conference Panel Presentation and Participation

Would Self-Organised or Self-Managed Networks Lead to Improved QoS?, IFIP/IEEE IWQoS 2005, Passau, Germany, David Hutchison, chair, June 2005.

Network Processors: Prospects for Practical Deployment, IEEE Hot Interconnects 2004, Stanford CA, Bryan Lyles and James P.G. Sterbenz co-chairs, August 2004.

Programmability, Active Networking, Applications, and the OpenArch Community, IEEE OpenArch 2003, San Francisco CA, Bobby Bhattacharjee chair, April 2003

Network Processors: Role in High-Speed Networks, IEEE HSN Workshop, San Francisco CA, James P.G. Sterbenz chair, March 2003

Securing Wireless Mobile Networks: Is it Possible?, INFOCOM 2002, New York, Will Ivancic chair, June 2002

The End of the 'End-to-End Argument'?, ICNP 2001, Riverside CA, Lixia Zhang chair, November 2001

Active Networks in the Real World?, ICNP'99, Toronto ON, November 1999

Smart Spaces: Research Issues and Problems, IEEE LCN'99, Lowell MA, October 1999

Intelligence in the Network, IEEE ComSoc TCCC Computer Communications Workshop, Phoenix AZ, September 1997

ATM: Dead or Alive?, IEEE Boston Chapter Seminar, September 1997

What Belongs in the Network, and What Does in the Network Mean, IFIP Protocols for High Speed Networks, Sophia Antipolis, France, James Sterbenz chair, October 1996

US Gigabit Testbed Programmes, Networkshop'93, Melbourne Australia, 1993
INET'93 Panel, San Francisco, CA

Teaching and Mentoring

University Course Teaching

Survivable, Resilient, and Disruption Tolerant Networking

- Graduate seminar EECS800, Department of Electrical Engineering and Computer Science, University of Kansas, fall 2005

Advanced Networking and the Internet

- Graduate course CSM8, Department of Computing, Lancaster University, (team teaching with Chris Edwards and Laurent Mathy) winter 2005

Advances in Telecommunications: Survivable Networks

- Undergraduate lectures for CS353, Department of Computing, Lancaster University, winter 2005

Data Networking

- Graduate course TSM G330, Telecommunication Systems Management, College of Engineering, Northeastern University, fall 2004

High-Speed Networking

- Graduate Diploma-level intensive course, Universität der Bundeswehr, München Germany, March 2004

Operating Systems

- Upper division undergraduate and graduate course SDP 420, Systems and Data Processing Program, Washington University in St. Louis, mid-1980s

Systems Programming

- Undergraduate course SDP 220, Systems and Data Processing Program, Washington University in St. Louis, mid-1980s

Conference Tutorials

Protocols for High-Speed Networks: A Systematic Approach to High-Bandwidth Low-Latency Communication

- IEEE Hot Interconnects, Stanford CA, August 2002, August 2003, August 2004
- IEEE MILCOM, Boston MA, October 2003
- IEEE ICN/ICWHLN, Atlanta GA, August 2002

Introduction to Active Networks (with Bernhard Plattner)

- IEICE Active Network Technologies and Applications, Osaka Japan, May 2003
- IFIP IWAN, Zürich Switzerland, December 2002

Introduction to Active Networks (with Alden Jackson)

- IEEE/ACM Workshop on Mobile Software Agents, Montreal QC, August 2001
- IEEE Intelligent Network Workshop (IN) 2001, Boston MA, May 2001

ATM Technology and Networking

- IBM Research, 1993 and 1994
- GTE Laboratories ~1995

Thesis Supervision

Primary and Joint Supervision:

- Linlin Xie, *Mechanisms for DDoS and Flash Mitigation*, Lancaster University, Ph.D. (in progress with David Hutchison)
- Christoph Wirz, Dipl.Ing., *Active Network Multicasting and Tree Monitoring with SENCOMM*, ETH Zürich Diploma Thesis DA-2002.29, October 2002

Co-Examiner:

- Ralph Keller, Dr. Sc. Techn., *Self-Configuring Active Services for Programmable Networks: A Routing-Integrated Approach*, ETH Zürich Doctoral Dissertation 15372, Shaker Verlag, Aachen, 2004 (with Bernhard Plattner and Jonathan Turner)
- Roman Pletka, Dr. Sc. Techn., *Adaptive End-to-End Quality of Service Guarantees in IP Networks*, ETH Zürich Doctoral Dissertation, 15481, Shaker Verlag, Aachen, 2004 (with Burkhard Stiller)

Committee Membership:

- Rajesh Krishnan, Ph.D., *Efficient Self-Organization of Large Wireless Sensor Networks*, Boston University Department of Electrical and Computer Engineering Doctoral Dissertation, July 2003
- Chien-Chun Lu, University of Pittsburgh, 1999

Graduate Student Intern Supervision

- Christoph Wirz, ETH Zürich, 2002, at BBN Technologies
- Leon Poutievski, University of Kentucky, 2000, 2001, at BBN Technologies
- Peerapon Siripongwutikorn, University of Pittsburgh, 1998, at GTE Laboratories
- Che-Ming Chang, University of Pittsburgh, 1997 at GTE Laboratories
- Chien-Chun Lu, University of Pittsburgh, 1996, at GTE Laboratories
- Samrat Bhattacharjee, Georgia Tech, 1995, at GTE Laboratories

High School and Middle School Science Fair Judging

- Hopkinton Mass. School District, 2001–2005
- Massachusetts regional and State, 2002–2004

Professional Activities

Editorial Board Membership

Journal of Communications and Networks, 2000–2004,
Division Co-Editor for Networks and Services, 2005–present

IEEE Network Magazine, 1999–present

Computer Networks Journal, 1999–2002

Special issues

- Co-editor (with Dimitrios Stiliadis) of *Hot Interconnects* special issue of *IEEE Micro*, to appear 2005
- Co-editor (with Bernhard Plattner and Christian Tschudin) of *Active Networks* special issue of *Computer Networks*, to appear 2005
- Co-editor (with Bryan Lyles and Ira Richer) of *Applications Enabling the Wide Scale Deployment of Gigabit Networks* special issue of *IEEE Journal on Selected Areas in Communications*, Vol.13 #5, June 1995

Professional Society Leadership

Chair, IFIP Protocols for High-Speed Networks international steering committee (PfHSN), 2000–present

Member, IFIP Active Networks international steering committee 2003–present

Member, ICICE (Japan) Communications Society Special Technical Group on Active Network Technologies and Applications (ANTA), 2003–present

Member, IEEE ComSoc Technical Committee on High-Speed Networking (TCHSN) formerly TC Gigabit Networking (TCGN) Steering Committee, 1992–present

Member, IEEE Communications Society Strategic Planning Committee, 1998–1999

Chair, IEEE Communications Society Technical Committee on Gigabit Networking (founding member), 1994–1998

Member, IEEE Communications Society Boston Section Steering Committee

Professional Society Membership

Senior Member IEEE Communications Society and Computer Society

Member IEE (Institution of Electrical Engineers), United Kingdom

Member IEICE (Institute of Electronics, Information and Communications Engineers) Communications Society, Japan

Member ACM SIGCOMM, SIGMOBILE, SIGARCH, SIGOPS, SIGMICRO

Pioneer Member Internet Society; member of Interplanetary SIG

IFIP working group 6.2 (network and internetwork architectures)

Listed in *Who's Who in America*, Marquis, 2001–present.

Who's Who in the World, Marquis, 2002–present

Conference and Workshop Leadership

General Co-Chair, IEEE Hot Interconnects, Stanford CA, August 2005

Technical Program Co-Chair, IEEE Hot Interconnects, Stanford CA, August 2004

Technical Program Co-Chair, IFIP/IEICE/IEEE International Working Conference on Active Networks (IWAN) 2003, Kyoto Japan, December 2003

Technical Program Co-Chair, IFIP International Working Conference on Active Networks (IWAN) 2002, Zürich Switzerland, December 2002

Technical Program and General Co-Chair, IFIP/IEEE Protocols for High Speed Networks (PfHSN) 1999, Salem MA, August 1999

Vice-General Chair, ACM SIGCOMM, Cambridge MA, August–September 1999

Technical Program Chair, IEEE TCGN Gigabit Networking Workshops 1994, 1995, 1996

Conference and Workshop Activities

Member of numerous technical program committees, including:

- ACM SIGCOMM DTN 3005, SIGCOMM FDNA 2003, SIGCOMM 1994–1995, NOSSDAV 1997
- IEEE ICDCS 2006, GI 2005, GBN/HSN 1992–2003, HotI 2002–2005, HPCS 1995–1997, INFOCOM 2006, 1994–1998, OpenArch 1999–2001, 2003
- IFIP HPN 1997, IWAN 2004–2005, PfHSN 1992–2002

Session chair for numerous events, including IEEE INFOCOM and ACM SIGCOMM

Reviewer for numerous conferences, workshops, and journals

Other Review Activities

National Science Foundation panel participation

- Infrastructure panels, 2005
- CISE Networking Cluster panels, 2004
- ITR panels, 2000, 2001

Reviewer, Interplanetary Internet Project, DARPA ITO NGI, 1999–2001

National Academies CSTB reviewer for *Looking Over the Fence at Networks: A Neighbors View of Networking Research*, National Academies Press, 2001.

Other Activities

Civic Service

Town of Hopkinton Massachusetts

- Master Plan Committee (technology and transportation subcommittee leader), 2004–2005
- Traffic Committee member, 2001–2005

References

Available on Request