

John Buford, PhD

EDUCATION

PhD Computer Science, Graz University of Technology, Austria.
Thesis on Distributed Constraint Logic Programming and AI Planning.
Title: Architecture and Formalisms for Intelligent CAD
Thesis Advisor: Hermann Maurer O.Univ.-Prof. Dr.Dr.h.c.mult.

MS EE&CS, Massachusetts Institute of Technology
Thesis on Color Image Compression
Thesis Advisor: William F. Schreiber, Prof. of Elec. Engr. Emeritus

BS EE&CS, Massachusetts Institute of Technology

MIT Sloan School of Management executive education courses: Product Development; Managing Technical Professionals; Internet Business Strategy

PROFESSIONAL EXPERIENCE

Avaya Labs Research Lincroft, NJ
Research Scientist

1/2007 – present

- Research in SIP application servers, feature interaction, and P2P overlays

Panasonic Princeton Laboratory Princeton, NJ
Project Manager and Lead Scientist

11/2003 – 1/2007

- Research in Internet-scale peer-to-peer overlays for future wireless mobile consumer electronics devices

Kada Systems Burlington, MA and Charlotte, NC
4/2002 – 6/2003

Vice-President of Software Development

- Startup company with customers including Cisco, Texas Instruments, and Analog Devices.
- Managed all product development for best-of-breed startup in PDA and wireless embedded systems software

Altusys Lexington, MA
8/2001 – 3/2002, 1/2007 - present
President and Co-Founder

- Develops technology for homeland security, invented the concept of Situation Management for complex real-time sensor-rich environments
- 1/2007 – present: Funded by two DoD agencies in cyber security research
- 8/2001 – 3/2002: Developed business plan for VC funding, targeted at operation support systems for carriers and ISPs

Verizon Technology Waltham, MA
5/1999 – 7/2001
Director Internet Technologies

- Verizon Technology is the R&D organization for Verizon, the largest

telecommunications company in the US.

- Managed a research department with goals tied to emerging business opportunities in web caching, network QoS, VoIP, spam analysis, VoD
- Multiple contract negotiations and deliveries to Genuity

GTE Laboratories **Waltham, MA**
 10/1997 – 5/1999

Senior Technologist and Chief Software Architect-OSS

- Chief Software Architect for all projects in 100-researcher laboratory for large-scale distributed service and network management for GTE's national network

ACADEMIC EXPERIENCE

1988 - 1997 **University of Massachusetts Lowell Lowell, MA**

Associate Professor of Computer Science, with tenure

- 1994 – 1997 Assoc. Prof. Computer Science, with tenure
- 1988 – 1994 Assist. Professor of Computer Science
- 1996 – 1997 Sabbatical at MIT
- 1994 – 1999 Adjunct Faculty, Univ. California Santa Cruz Extension
- 1994 Visiting Senior Lecturer, Univ. of Auckland, New Zealand
- Courses taught: Multimedia Networking, Multimedia Information Systems; Web Systems, Java Virtual Machine implementation, Mach Internals, Algorithms; Operating Systems; Distributed Object-Based Computing, Artificial Intelligence

Director, Distributed Multimedia Systems Laboratory

- PI or Co-PI on \$2M research funding, sponsors included Hewlett Packard, Nynex Science and Technology, Fujitsu, Unix Systems Laboratories, Texas Instruments
- Developed an early unix-based digital multimedia workstation, funded by HP, Unix Systems Laboratories, and Commodore
- Invented first compression scheme for multimedia document storage and transmission in XML-style encodings, pre-dating WAP and binary XML research: (WO 1997/034240) Compact Tree for Storage and Retrieval of Structured Hypermedia documents.
- Developed first structured query language for XML-style multimedia document databases, predating XML query

1983 - 1988 **University of Denver** **Denver, CO**

Lecturer in Computer Science

- Full-time faculty member concurrent with completing PhD research at Technische Universität Graz
- Head, Artificial Intelligence research group consisting of 3 faculty and several graduates students

CONSULTANT

Technology consultant to many companies including Fidelity, Putnam Investments, Eaton Semiconductor, Dow Jones, Digital Equipment, GTE
Intellectual property consultant on various cases including Amazon vs. Barnes & Noble.

PATENTS

2 US Patents issued
19 Patents pending

PUBLICATIONS

Books

J. Buford (contr. ed.) Multimedia Systems. ACM Press and Addison-Wesley, 1994.

Journals

J. Buford. Management of Peer-to-Peer Overlays. International J. of Internet Protocol Technology, Special Issue on Management of IP Networks and Services. Accepted Nov 5, 2007; To appear.

J. Buford, A. Brown, M. Kolberg. Exploiting Parallelism in the Design of Peer-to-Peer Overlays. Journal of Computer Communications. Special Issue on Foundations of Peer-to-Peer Computing Vol 31/3, Feb. 2008, pp 452-463.

L. Lewis, J. Buford, G. Jakobson. Inferring Threats in Urban Environments with Uncertain and Approximate Data: An Agent-based Approach. Journal of Applied Artificial Intelligence. Online Aug 2007. To appear.

S. Nathayana, D. Braun, J. Buford, et al. Peer-to-Peer Streaming for Networked Consumer Electronics. IEEE Communications Magazine. June 2007.

J. Buford, G. Jakobson, L. Lewis. Multi-Agent Situation Management for Large-Scale Disaster Relief Operations. Intl Journal of Intelligent Control and Systems. Special Issue on Emergency Management Systems. Vol. 11, No. 4, Dec. 2006.

J. Buford. Telecommunication Services and Service Management Challenges. J. Universal Computer Science. Special Issue for the Future of Computer Science Symposium (FOCSS). June 2001.

L. Rutledge, J. Buford, R. Price. Mobile Objects in the Distributed HyOctane Hyperdocument Server. J. Computers and Graphics, v 20 n 5, 1997.

J. Buford, L. Rutledge, C. Keskin, and J. Rutledge. HyOctane: A HyTime Engine for an MMIS. J. Multimedia Systems (1) 4, 1994.

Peer-to-Peer Networking, Pervasive and Mobile Computing

A. Brown, M. Kolberg, J. Buford. An Adaptable Service Overlay for Wide-Area Network Service Discovery. IEEE Globecom 2007 Workshop - Enabling the Future Service-Oriented Internet. Nov. 2007

J. Buford, A. Brown, M. Kolberg. Analysis of an Active Maintenance Algorithm for an $O(1)$ -Hop Overlay. IEEE Globecom 2007, Nov. 2007

J. Buford, A. Wang, X. Hei, Y. Liu, K. Ross. Discovery of In-Band Streaming Services in Peer-to-Peer Overlays. IEEE Globecom 2007, Nov. 2007.

S. I. Ahamed, J. Buford, M. Sharmin, M. M. Haque and N. Talukder. Secure Service Discovery. in Handbook of Research on Wireless Security. Idea Group Reference (eds. Y. Zhang, J. Zheng, M. Ma). 2008.

H. Yu, J. Buford, M. Merabtis. Improving Messaging Security in Structured P2P Overlays. ICME 2007. June 2007.

H. Yu, J. Buford. Advanced Topics in Peer-to-Peer Overlay Multicast. in Encyclopedia of Wireless and Mobile Communications (Ed. B. Fuhr) CRC Press. 2008

A. Brown, J. Buford, M. Kolberg. Tork: A Variable-Hop Overlay for Heterogeneous Networks. Fourth Workshop on Mobile Peer-to-Peer 2007. March 2007.

M. Kolberg, F. Touvet, J. Buford, A. Brown. A Markov Model for the EpiChord Peer-to-Peer Overlay in an XCAST Enabled Network. IEEE ICC 2007, June 2007.

J. Buford, A. Brown, M. Kolberg. Multi-Destination Routing and the Design of Peer-to-Peer Overlays. Workshop on Peer-to-Peer Multicasting 2007

(P2PM 07) at IEEE CCNC 07. January 2007.

J. Buford, A. Brown, M. Kolberg. Parallelizing Peer-to-Peer Overlays with Multi-Destination Routing. IEEE Consumer Communications and Networking Conference (CCNC 2007). Jan 2007.

E. Celebi, P. Frankl, J. Buford. An Integrated Peer-to-Peer Data and Service Dissemination System. IEEE Consumer Communications and Networking Conference (CCNC 2007). Jan 2007.

J. Buford, E. Celebi, P. Frankl. Property-Based Peer Trust in the Sleeper Service Discovery Protocol. Security, Privacy, and Trust for Pervasive Applications (SPTPA 2006). Sept. 2006.

J. Buford, E. Celebi, P. Frankl. Sleeper: A Power-Conserving Service Discovery Protocol. Mobiquitous 2006. July 2006.

J. Buford, B. Burg. Using FIPA Agents with Service Oriented Peer-to-Peer Middleware. MOSO 2006. May 2006.

J. Buford, R. Kumar, G. Perkins. Composition Trust Bindings in Pervasive Computing Service Composition. IEEE Workshop on Pervasive Computing and Communication Security (PerSec) March 2006

J. Buford, A. Brown, M. Kolberg. Meta Service Discovery. IEEE 3rd International Workshop on Mobile Peer-to-Peer Computing (MP2P) 2006, March 2006.

J. Buford, I Park, G. Perkins. Social Certificates and Trust Negotiation. IEEE CCNC 2006. Jan 2006.

J. Buford, R. Kumar. Analysis of Using Java Card™ for DRM Master Key Security. IEEE Workshop on Digital Rights Management. Jan 2006.

SIP and Feature Interaction

J. Zhou, J. Buford, K. Dhara, X. Wu, M. Kolberg. Discovery and Composition of Communication Services in Peer-to-Peer Overlays. IEEE Workshop on Service Discovery and Composition in Ubiquitous and Pervasive Environments (SUPE'07). Nov. 2007.

J. Buford, V. Krishnaswamy. Reducing International Roaming Costs for Global Enterprise Mobility. NGMAST 07. Sept 12-14, 2007.

J. Buford, A. Kaplan, V. Bhasin. Transparent Roaming Between Instant Messaging and Presence Service Providers in Wireless Networks. IEEE CCNC 2006. Jan 2006.

I. Kurilin, V. Safanov, J. Buford. Design of a Reference Implementation of a Standard Java API for Instant Messaging and Presence. ICSE. 2006.

J. Buford, M. Rahman. Instant Messaging and Presence Service (IMPS). In Wireless Multimedia: Technologies and Applications. (eds. A. Salkintzis and N. Passas). 2005.

M. Rahman, B. Hu, J. Buford, A. Kaplan. Mobile multimedia instant messaging and presence services: the architecture and protocols. IEEE International Symposium on Consumer Electronics, 2004, 208 – 213

Situation Management and Situation-Aware Fusion

J. Buford, L. Lewis, G. Jakobson. Insider Threat Detection Using Situation-Aware MAS. submitted 3/1/08 to Fusion 2008 .

G. Jakobson, J. Buford, L. Lewis. Collaboration Agents for C3 Tactical Urban Operations. Defense Transformation and Net-Centric Systems 2008 SPIE Security and Defense 2008. March 2008.

G. Jakobson, J. Buford, L. Lewis. Cognitive Feedback and Adaptation in

Multi-agent Systems for Disaster Situation Management. Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security and Homeland Defense VII. SPIE Security and Defense 2008. March 2008.

L. Lewis, G. Jakobson, J. Buford. Situation-Aware BDI Agents in Support of Autonomous Intelligence, Surveillance, and Reconnaissance (ISR) Analysis. Conference on Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications 2008. SPIE Security and Defense 2008. March 2008.

G. Jakobson, J. Buford, L. Lewis. Situation Management: Basic Concepts and Approaches. Springer Verlag. Lecture Notes in Geoinformation and Cartography, 2007; Proceedings of the Third International Workshop, St. Petersburg, Russia, pp. 18-33.

G. Jakobson, J. Buford, L. Lewis. A Framework of Cognitive Situation Modeling and Recognition. 3rd IEEE Workshop on Situation Management (SIMA 2007). Oct 2006.

J. Buford, G. Jakobson, L. Lewis. Reflective Situation Management. 3rd IEEE Workshop on Situation Management (SIMA 2007). Oct 2006.

J. Buford, G. Jakobson, L. Lewis. Extending BDI Multi-Agent Systems with Situation Management. Intl Conference on Information Fusion 2006, June 2006.

G. Jakobson, J. Buford, L. Lewis. A Correlation-Driven Reactive Layer for Situation-Aware BDI Agent Architecture. Joint Conference on Knowledge-Based Software Engineering 2006 (JCKBSE'06). Aug 2006.

L. Lewis, J. Buford, G. Jakobson. Threat and Vulnerability Assessment of Large Urban Transportation Facilities. IEEE Conference on Technologies for Homeland Security 2006. June 2006.

G. Jakobson, N. Parameswaran, J. Buford, P. Ray, L. Lewis. Situation-Aware Multi-Agent System for Disaster Relief Operations Management. ISCRAM 2006.

J. Buford, G. Jakobson, L. Lewis, N. Parameswaran, P. Ray. D-AESOP: A Situation-Aware BDI Agent System for Disaster Situation Management. First International Workshop on Agent Technology for Disaster Management (ATDM) May 2006, Hakodate, Japan.

G. Jakobson, L. Lewis, C. Matheus, M. Kokar, J. Buford. Overview of Situation Management at SIMA 2005. SIMA Workshop. MILCOM 2005.

G. Jakobson, J. Buford, and L. Lewis. A Hybrid Approach to Event Correlation and Situation Management. Proc of the Ninth IFIP/IEEE Intl Symposium on Integrated Network Management, May 2005 Nice, France.

J. Buford, G. Jakobson, and L. Lewis. Case Study of Urban Transportation Threat Monitoring Using the AESOP Situation Manager. Proc of the 2005 IEEE Conf Technologies for Homeland Security, April 2005, Boston, MA.

G. Jakobson, L. Lewis, and J. Buford. Behavioral Anomaly Detection in Dynamic Self-Organizing Systems: A Cognitive Fusion Approach. Proc. of the Intl Conf on the Integration of Knowledge Intensive Multi-Agent Systems (KIMAS '05), April 18-21, 2005, Waltham, MA.

G. Jakobson, L. Lewis, J. Buford, and E. Sherman. Battlespace Situation Analysis: The Dynamic CBR Approach. Proc. of the Military Communications Conference (MILCOM 2004), Nov 2004, Monterey CA.

J. Buford, G. Jakobson, and L. Lewis. Intelligent Agent-Based Architecture for Real-Time Threat Assessment. Proc of the 2004 IEEE Conf on Technologies for Homeland Security, April 21, 2004, Cambridge, MA.

G. Jakobson, J. Buford, and L. Lewis. An Approach to Integrated Cognitive

Fusion. Proc of the 7th Intl Conf on Information Fusion, June 2004, Stockholm, Sweden.

G. Jakobson, L. Lewis, and J. Buford. Towards an Architecture for Reasoning about Complex Event-Based Dynamic Situations. 26th Intl Conf on Software Engineering, International Workshop on Distributed Event-Based Systems (DEBS '04), May 24-25, 2004, Edinburgh, Scotland.

Network and Service Management

J. Buford, D. Bowie, X. Huang, M. Mady. Automatic Ticketing of Email for ISP Customer Care. IFIP/IEEE DSOM 2001, Oct 2001, Nancy, France.

J. Lee, W. Miniscalco, M. Li, W. D. Shambroom, J. Buford. Analysis of Web Workloads Using the Bootstrap Methodology. Proceedings Web Caching Workshop 2001. June 2001.

J. Buford, G. Jakobson. Managing Dynamic IP Services: Correlation-Based Scenarios and Architecture. IEEE Enterprise Networking 2001 June 2001.

J. Buford, J. Hefter, C. Matheus. Mobile Technology in Telecommunications Operations. Interactive Applications of Mobile Computing. Rostock, Germany, November 1998

Invited Conference Papers (Multimedia Systems)

J. Buford. Real-time Multimedia and the Web: Interactive TV II? (invited paper). WebNet 98 (Nov 1998) Orlando.

J. Buford. Managing Multimedia Information: A Research Agenda (invited presentation). SIMOS 98 Workshop on Management of Multimedia Information, Hierden, The Netherlands (May 1998)

J. Buford. Distributed Multimedia Systems. (invited presentation) SIKS 98. Zeist, The Netherlands (May 1998).

J. Buford. Multimedia Document Databases: Survey of Query Languages. (invited paper) DEXA 97 Workshop on Query Processing Issues in DMIS. Sept. 1997. Toulouse, France.

J. Buford. Multimedia and the World Wide Web: Past, Present, Future. (invited paper). Intl Wireless and Telecommunicatios Symposium 1997. Kuala Lumpur, Malaysia. May 1997.

J. Buford. Multimedia Information Delivery and Processing. (invited paper). SPIE Review. January 1996.

J. Buford. The Advent of Integrated Multimedia Environments. (invited paper) ED-MEDIA 93.

Multimedia Systems

F.Andres, J. Buford and K.Ono. An Application-oriented Approach for HyTime Structured Document Management, , in Proc. 9th Int. Conference on Database and Expert Systems Applications, Austria, August 1998.

J. Buford, C. Gopal. Delivery of MHEG-5 in a DAVIC ADSL Network. ACM Multimedia 97, Seattle, WA. Nov 1997

J. Buford. Lessons from Real-Time Hypermedia Systems. W3C Workshop on Real-Time Multimedia and the Web. Nice, France. Oct. 1996.

J. Buford. CORBA and WWW: On a Collision Course. Joint W3C/OMG Workshop on Distributed Objects and Mobile Code. Boston, June 1996.

J. Buford and L. Rutledge. Third Generation Distributed Hypermedia Systems. in Handbook of Multimedia Information Management (ed. W. Grosky, R. Jain, and R. Mehrotra), Prentice Hall. 1997.

- C. Gopal and J. Buford. Delivering Hypermedia Sessions from a Continuous Media Server. in *Multimedia Information Storage and Management* (ed. S. Chung). Kluwer Press. 1996.
- L. Rutledge, J. Buford, R. Price. *Mobile Objects and the HyOctane Distributed Hypermedia Server*. IMC 1996.
- Maria da Graça Campos Pimentel, John F. Buford: Non-invasive improvements to hyperlinking with HTML. *WebNet* 1996.
- Chetan B. Gopal, César A. C. Teixeira, John F. Buford: MHEG-5 delivery in the DAVIC environment. *WebNet* 1996.
- J. Buford. HyTime: Evaluation and Implementation Experience. *ACM Hypertext 96*, March 1996. Washington DC
- Lloyd Rutledge, John Buford, John Rutledge. Modeling Techniques for HyTime, Proc International Conference on Multi-Media Modeling (MMM'95), Singapore, November 1995
- J. Buford. A Transfer Protocol for an Open Hyperdocument Model Server. *ED-MEDIA 95*. June 1995
- J. Buford. Evaluation of a Query Language for Structured Hypermedia Documents. *Proc. DAGS 95--Electronic Publishing and the Information Superhighway*. May 1995
- Buford, J., Rutledge, L., and Gopal, C., Storage Server Requirements for Delivery of Hypermedia Documents. *Proc. Multimedia Computing and Networking 95*.
- L. Rutledge, J. Buford, J. Rutledge. Applying HyTime to HTML. *IASTED 1995*.
- Buford, J., Rutledge, L., and Rutledge, J. Toward Automatic Generation of HyTime Applications. *Proc. Eurographics Multimedia 94*, June 1994.
- Buford, J., Doran, M., and Bornfreund, J. Open Distributed Multimedia Computing. in *Handbook of Multimedia* (ed. by J. Keyes), McGraw-Hill, 1994.
- Buford, J., Rutledge, L., and Rutledge, J. Integrating Object-Oriented Scripting Languages with HyTime. 1994 IEEE Intl Conf on Multimedia Computing and Systems, May 1994.
- Buford, J., and Gopal, C. Standardizing a Multimedia Interchange Format: A Comparison of OMFI and MHEG. 1994 IEEE Intl Conf on Multimedia Computing and Systems, May 1994.
- Buford, J. Requirements for Multimedia Standards. U.S. Dept of Defense, Defense Information Systems Agency, JIEO 1908, Sept. 1994.
- Buford, J., Rutledge, L., Keskin, C., and Rutledge, J. HyOctane: A HyTime Engine for an MMIS. *ACM Multimedia 1993*, August 1993
- Buford, J. and Heines, J. Improving Visual Programming for Multimedia Authoring. *Proc. World Conference on Educational Multimedia and Hypermedia (ED-MEDIA 93)*.
- Buford, J. A Design Space Perspective on the Evolution of Multimedia Technology. *Proc. on the Challenge of Multimedia*. Sponsored by MIT and Trinity College, Dublin. March 1993.
- Buford, J. On the Design of Multimedia Interchange Formats, Third International Workshop on OS and Network Support for Video and Audio, 1992.
- Buford, J., Rutledge, J., and Heines, J. Visual Programming Abstractions for Interactive Multimedia Presentation Authoring (Short Paper). *Proc. 1992 International Workshop on Visual Languages*, Sept. 1992.
- Buford, J., and Syta, A. Routing of Multimedia Connections in Hybrid Networks. *SPIE Proceedings 1786 Fiber Networks for Voice, Video, and*

Multimedia Services. Sept. 1992.

Buford, J., Rutledge, J., Miner, R., and Krolak, P. Supporting Real-Time Analysis of Multimedia Communication Sessions. SPIE Proceedings 1785 Enabling Technologies for High Bandwidth Applications. Sept. 1992.

Buford, J., Keskin, C., and Rutledge, J. Toolkits for Multimedia Interface Design. Exhibition '92, June 1992.

Buford, J. and Li, X. Network Protocol Issues for Continuous Media Applications (Short Paper). 2nd International Workshop on OS and Network Support for Digital Audio and Video. Nov. 1991.

Artificial Intelligence

Buford, J. Parallel Objects on Distributed Constraint Logic Programming Machines. OOPSLA Workshop on Object-Based Concurrent Programming, SIGPLAN Notices, April, 1989.

Buford, J., Lakshmipathy, N., and Schlesinger, J. A Tutoring System with Incomplete Domain Expertise. Proc. Intl Conf. on AI and Education '89, Amsterdam, May, 1989.

Buford, J., Lakshmipathy, N., and Schlesinger, J. An Intermediate Representation for Mathematical Problem Solving. Proc. International Conference on Computer Assisted Learning, Springer-Verlag, 1989.

Buford, J. Planning and Explaining with Interacting Expert Systems. in Intelligent CAD Systems 2: Implementation Issues (ed. P. ten Hagen, T. Tomiyama, and V. Akman) Springer-Verlag, (1989).

Buford, J. Multi-Agent Reasoning in Design. Proc AAAI Workshop on AI in Design, August, 1988.

Buford, J. A Theoretical Model for Intelligent CAD, in Intelligent CAD Systems 1: Theoretical and Methodological Aspects (eds. P.J.W. ten Hagen, T. Tomiyama), Springer-Verlag, (1987).

J. Buford, H. Maurer. A Rule-Based Editor for Intelligent CAI. Proc. 2nd RMCAI June 1987

J. Buford. POOL: Parallel Object Oriented Logic. 1987 Rocky Mountain Artificial Intelligence Conference, Boulder, CO, (June 1987).

Koegel, J. Logic for CAD. 1987 IEEE Design Automation Workshop on AI and CAD, Phoenix, AZ, Jan 1987

**TPC CHAIR AND
GENERAL CHAIR**

TPC Chair, IEEE Consumer Communications and Networking Conference 2009 (CCNC 09)
TPC Co-Chair, IEEE Globecom 2007 General Symposium, Peer-to-Peer Networking track
TPC Vice-Chair, IEEE Consumer Communications and Networking Conference 2007, P2P and Content Distribution.
TPC Co-Chair, 4rd IEEE International Workshop on Mobile Peer-to-Peer Computing (MP2P'07)
TPC Co-Chair, 5th IEEE International Workshop on Mobile Peer-to-Peer Computing (MP2P'08)
TPC Co-Chair, IEEE Workshop on Situation Management (SIMA) 2007, co-located with IEEE MILCOM
TPC Co-Chair, IEEE Intl Workshop on Peer-to-Peer Multicasting (P2PM 2007).
Special Session Co-Chair, Intl Conference on Information Fusion 2008.
Special Session Co-Chair on Peer-to-Peer Overlays, IEEE MILCOM 2008.
General chair, ACM Multimedia 99; Treasurer, ACM Multimedia 96, 97.

**EDITORIAL
BOARD AND
PROGRAM
COMMITTEES**

Journal Board: Peer-to-Peer Networking and Applications, Springer-Verlag.
Program Committee member – Fusion 2008; P2P 2008; IEEE WCNC 2008; SPTPA 2007, 2008; IEEE CCNC 2005,2006,2007; IEEE IC Multimedia Computing and Systems 94, 96, 97, 99; ACM Multimedia 96, 99; EGMM 00, 01, 04, 05; ED-MEDIA 95, 96, 97, 98, 99; WebNet 96, 97, 98, 99; ISMM Intl Conference on Distributed Multimedia Systems and Applications 94, 95; 95 DAGS; 1997 WoMH; IWMMDBMS 95, 97, 99; HICSS-32; ICON 98, 99; International Workshop on Mobile Computing 96, 98, 2000, 2003.
Journal Board: J. Multimedia Tools and Applications 1994 - 1998
Journal Reviewer: ACM/IEEE Transactions on Networking, IEEE Trans. on Multimedia; J. Network and Computer Applications; IEEE Communications Magazine.
IEEE Computer special issues on Visual Programming, Content Based Retrieval; J. Network System Management 2002
Reviewer: National Science Foundation; NSERC (Canada)
Reviewer: ACM Multimedia 95, 00, 01; ECHT 95, UIST 92, Hypertext 96 ;

STANDARDS

IRTF Scalable Adaptive Multicast Research Group, Co-chair, March 2006 - present
Spec Lead, Java Community Process, JSRs 164, 165, 186, 187 (These specifications all advanced to standards while I was the Spec Lead).
Chair, 1994-1997, X3L3.3 Multimedia and Hypermedia Information Encoding, a US standards committee representing the US to ISO SC29/WG12 MHEG. Formed committee in 1994. Member of X3L3 92 - 97. Treasurer X3L3 1996 - 1997.
US Head of Delegation to ISO JTC1/SC29/WG12 MHEG, 1992 - 1996.
Co-editor of ISO MHEG Part 3: Support for scripting languages. 1994 - 1996. (ISO standard 13522-3).