

# Nalini Venkatasubramanian

School of Information & Computer Science  
Bren Hall 3019  
University of California, Irvine  
Irvine, CA 92697-3435

Email: [nalini@ics.uci.edu](mailto:nalini@ics.uci.edu)  
Fax: (949) 824 4056  
URL: [www.ics.uci.edu/~nalini](http://www.ics.uci.edu/~nalini)

## Research Interests

Distributed Systems Middleware, Multimedia Systems and Applications, Mobile and Ubiquitous Computing, Formal Methods, Data Management, Grid Computing.

## Education

### **Ph.D. - Computer Science**

University of Illinois at Urbana-Champaign, 1998.

Thesis Title - *An Adaptive Resource Management Architecture for Global Distributed Computing.*

Advisor: Prof. Gul A. Agha.

### **M.S. - Computer Science**

University of Illinois at Urbana-Champaign, 1991.

Thesis Title - *Hierarchical Garbage Collection in Scalable Distributed Systems.*

### **B.E. - Computer Science and Engineering**

University Visvesvaraya College of Engineering, Bangalore University, 1989.

## Employment

*1998 – Present*

### **Professor**

School of Information and Computer Sciences, University of California, Irvine

### **Associate Professor (2004-2008)**

School of Information and Computer Sciences, University of California, Irvine

### **Assistant Professor (1998-2004)**

School of Information & Computer Sciences, University of California, Irvine.

### **Faculty**

Center for Emergency Response Technologies (CERT).

*Fall Quarter, 1997*

### **Visiting Lecturer**

Department of Computer Science, University of Illinois at Urbana-Champaign, (on leave of absence from HP Labs).

*1994 – 1998*

### **Member of Technical Staff**

Hewlett-Packard Laboratories, Palo Alto. Media Server Research Group, Broadband Information Systems Lab and E-Services Research Group, Future Systems Department.

*1991 – 1994*

### **Software Design Engineer**

Hewlett-Packard, Cupertino.

Object-Oriented Database Lab, Cooperative Computing Systems Lab.

*Spring, 1991*

### **Research Assistant**

Open Systems Laboratory, Dept. of Computer Science, University of Illinois at Urbana-Champaign.

*Spring and Fall, 1990*

### **Head Teaching Assistant**

Dept. of Computer Science, University of Illinois at Urbana-Champaign.

*Summer, 1990*

### **Summer Employee**

IBM T.J. Watson Research Center.

*Fall, 1989*

### **Teaching Assistant**

Dept of Computer Science, University of Illinois at Urbana-Champaign, for a

grad/senior UG course on advanced computer architectures

### **Awards**

- National Science Foundation Career Award, Networking Research Program, 1999.
- Teaching Excellence Award, Division of Undergraduate Education, University of California, Irvine, 2002.
- Best Paper Award, IEEE Consumer Communications and Networking (CCN) Conference, Las Vegas, Jan 8th - 10th, 2006.
- Best Student Paper Award, IEEE Workshop on Multimodal Sentient Computing: Sensors, Algorithms and Systems ([WMSC 2007](#)) held in conjunction with IEEE CVPR (Computer Vision and Pattern Recognition) 2007.

### **Industry Experience**

*Multimedia Workload Characterization, Broadband Information Systems Lab, HP Labs.*

Developed video workload models and QoS metrics obtained by empirical studies of video-on-demand systems. Investigated economic models for interactive QoS for multimedia systems.

*Distributed Multimedia Servers, Broadband Information Systems Lab, HP Labs.*

Involved in design and implementation of distributed video servers, resource management (load-balancing, data placement, request assignment, real-time scheduling, high availability) and broadband networking for distributed multimedia and web servers.

*Digital Choreography and Virtual Environments, HP Labs.*

Recipient of a Grass Roots Basic Research Grant to pursue an investigation in digital dance and choreography. Prototype interactive animation systems from were extended to support digital choreography and conduct studies on motion manipulation in distributed environments.

*Object Oriented Database Management, Cooperative Computing Systems Lab, HP.*

Involved in the design and implementation of memory management schemes, interoperability facilities, authorization mechanisms, performance benchmarks and for a commercial object oriented database - OpenODB/Oadapter.

*Compilers for Parallel Architectures, IBM T.J. Watson Research Center.* Worked with the Hybrid Dataflow Architecture Group on compilation techniques for parallel machines developing abstract intermediate forms, representing and executing sequential and dataflow computation on a custom high performance architecture.

### **Selected Professional Activities and Invited Talks**

- Program Co-chair, IEEE Symposium on World of Wireless and Mobile Multimedia 2008 (WoWMoM 2008).
- General Chair, ACM/IFIP/USENIX Middleware 2007.
- Workshop Co-Organizer, Workshop on Reflective and Adaptive Middleware held with ACM Middleware - 2007, 2008.
- Associate Editor, IEEE Transactions on Mobile Computing, 2008.
- Commercial Tracks Co-chair, IEEE International Parallel and Distributed Processing Symposium, IPDPS 2007.

- Calit2 Igniting Technology Series Talk , “Customized Dissemination in the Large”, March 2007.
- Program Co-Chair, Workshop on Adaptive and Reflective Middleware, ACM Middleware 2006.
- Workshop Co-Organizer, Workshop on Reflective and Adaptive Middleware, ACM Middleware 2005.
- Workshop Co-Organizer, Workshop on Reflective and Adaptive Middleware, ACM Middleware 2004.
- Short Papers Chair, ACM Multimedia 2006.
- Invited Talk, Mobiquitous 2005. “Role of Mobile and Ubiquitous Computing in Emergency Response”
- Program Co-Chair, ACM/SPIE Conference on Multimedia Computing and Networking, 2005 (MMCN 2005).
- UCI TechTalk Series, “ Multimedia Support for the Homeland Security Domain”, 2004.
- Program Chair, ACM/SPIE Conference on Multimedia Computing and Networking, 2004 (MMCN 2004).
- Invited Talk, Hewlett-Packard Laboratories, “*Composability Issues for Mobile Middleware*”, 2003.
- Invited Talk, UC Mexus Program, “*MIRO: Adaptive Middleware for Mobile Internet Robots*”, 2003.
- Workshop Co-Organizer, Workshop on Reflective and Adaptive Middleware, ACM Middleware 2003.
- Plenary Panel Chair, Panel on Middleware for Sensor Applications, IEEE International Conference on Distributed Computing Systems (ICDCS 2003).
- Tutorial Speaker, Systems Support for Sensor Applications, IEEE High Performance Computing 2003.
- Tutorial Speaker, Platforms and Tools for Multimedia Applications, IEEE Design, Automation and Test Europe, 2004.
- Workshop Co-Organizer, Cal-(IT)<sup>2</sup> Workshop on Crisis Response, 2002.
- Program Vice-Chair, IEEE International Conference on Cluster Computing 2001.
- Publications Chair, IEEE International Conference on High Performance Computing 2001 (HiPC 2001).
- Associate Chair, Systems Track of the ACM Multimedia Conference, 2000.
- Invited Talk, OPENSIG 2000 Invited Talk, “*ComPOSE|Q – A Safe Middleware Framework for Large Scale Distributed Systems*”, Oct 2000.
- Conference Co-organizer and Program Committee Member IFIP Conference on Formal Methods in Object Based Open Distributed Systems 2000 (FMOODS'2000).
- Publications Chair, IEEE International Conference on High Performance Computing 2000 (HiPC 2000).
- Invited Talk, Digital Media Innovations, UC Santa Barbara, “*A Virtual Reality Enhanced Digital Surveillance System*”, 1999.
- Invited Talk, Novell Chairman Meeting, “*Flexible Middleware for Large Scale Distributed Computing*”, April 1999.
- Publications Chair, IEEE International Conference on High Performance Computing 1999 (HiPC 1999).
- Invited Talk, HRL Colloquium Series , “*Multimedia in Global Distributed Systems*”, Feb 1999.

- Panelist – “Java and Middleware for High Performance Computing”, IEEE International Parallel and Distributed Processing Symposium (IPDPS 99), *“Middleware Support for High Performance Computing”*, April 1999.
- Invited Talk, Hewlett-Packard Research Laboratories, *“QoS-enabled Customizable Middleware for Global Distributed Computing”*, Dec. 1998.
- Program Co-chair - Minitrack on Distributed Multimedia and Web Collaborations at HICSS '97 with Klara Nahrstedt, UIUC and Atul Prakash, University of Michigan, Ann Arbor.
- Executive Committee Member - University of California Digital Media Innovations (DiMI) program.
- Editorial Review Board Member, Journal of Database Management (JDM).
- NSF Panels and Workshops on Networking Research, Operating Systems and Compilers, CISE Infrastructure, Residential Broadband.
- Member of International Taskforce on “Local Distributed Computing: Technology Assessment, and a Look at What Lies Ahead”, combining academic and industry perspectives on the future of local distributed computing - January 1996.
- Hewlett-Packard representative on technical visits, university research reviews and trade shows.
- Reviewer (journals and conferences) - IEEE Transactions on Software Engineering, IEEE Concurrency, ACM Computing Surveys, ACM Multimedia Systems, IEEE Transactions on Parallel and Distributed Technology, Journal of Theory and Practice of Object Systems, ACM Multimedia, EUROPAR, PODC, ICMCS, ICDCS, FMOODS, Parallel Architectures and Languages - Europe.
- NSF/DARPA Next Generation Internet Meeting – *“QoS-enabled Customizable Middleware for Global Distributed Computing”*, Oct.1999.

***Program Committee Member:***

- Workshop on Context-aware Adaptation Mechanisms for Pervasive and Ubiquitous Services" (CAMPUS'08), DisCoTec Federated Series, 2008.
- IEEE Estimedia 2008
- IEEE International Conference on Distributed Computing Systems, ICDCS 2008
- ACM/SPIE Conference on Multimedia Computing and Networking MMCN 2008
- Fourth IEEE International Workshop on Sensor Networks and Systems for Pervasive Computing (PerSenS 2008), held in conjunction with IEEE Percom 2008.
- IFIP 2008 International Conference on Embedded and Ubiquitous Computing 2008 (EUC-08)
- IEEE Information Security Informatics (ISI) 2007.
- ACM/SPIE Conference on Multimedia Computing and Networking MMCN 2007
- IEEE International Conference on High Performance Computing HiPC 2007
- Sixth IEEE Workshop on Adaptive and Reflective Middleware 2007 in conjunction with ACM Middleware 2007.
- IEEE Estimedia 2007 Workshop in conjunction with the IEEE/ACM/IFIP CODES+ISSS 2007 Conference
- IEEE Information Security Informatics (ISI) 2006.

- ACM/SPIE Multimedia Computing and Networking 2006 (MMCN'06), San Jose, California.
- First IEEE International Workshop on Services and Infrastructure for the Ubiquitous and Mobile Internet (SIUMI 2006) in conjunction with IEEE Intl. Conference on Distributed Computing (ICDCS 2006)
- ACM SAC 2006, Track on Programming for Separation of Concerns.
- IEEE International Conference on eScience and Grid Technologies 2005.
- IEEE International Conference on Real Time Applications and Systems, Work in Progress Session, RTAS 2005
- ACM Workshop on End-to-End, Sense-and-Respond Systems, Applications, and Services in conjunction with [MobiSys '05](#)
- IEEE International Workshop on Next Generation Wireless Networks 2005 (WonGEN) in conjunction with International Conference on High Performance Computing (HIPC 2005)
- Fourth Workshop on Adaptive and Reflective Middleware 2005 in conjunction with ACM Middleware 2005.
- First International Workshop on Services and Infrastructure for the Ubiquitous and Mobile Internet (SIUMI 2005) in conjunction with IEEE Intl. Conference on Distributed Computing (ICDCS 2005)
- IEEE International Workshop on Parallel and Distributed Real-time Systems (WPDRTS 2005) in conjunction with IEEE International Parallel and Distributed Processing Symposium 2004 (IPDPS 2005).
- First International Workshop on Multimedia Service Composition in conjunction with ACM Multimedia 2005 (ACM MM 2005).
- ACM/IFIP/USENIX International Middleware Conference (Middleware) 2004.
- IEEE International Workshop on Parallel and Distributed Real-time Systems (WPDRTS 2004) to be held as a part of the IEEE International Parallel and Distributed Processing Symposium 2003 (IPDPS 2004).
- IEEE International Real-Time Systems Symposium (RTSS 2003).
- IFIP International Conference on Formal Methods for Open Object-Based Distributed Systems (FMOODS 2003).
- IEEE International Workshop on Parallel and Distributed Real-time Systems (WPDRTS 2003) to be held as a part of the IEEE International Parallel and Distributed Processing Symposium 2003 (IPDPS 2003).
- International Symposium on Distributed Objects and Applications (DOA) 2003.
- ACM Multimedia Conference, 2003.
- IEEE International Conference on Distributed Computing Systems (ICDCS), 2003.
- ACM/IFIP/USENIX International Middleware Conference (Middleware) 2003.
- International Symposium on Distributed Objects and Applications (DOA) 2002.
- IEEE International Workshop on Parallel and Distributed Real-time Systems (WPDRTS 2002) to be held as a part of the IEEE International Parallel and Distributed Processing Symposium 2002 (IPDPS 2002).
- IEEE International Conference on Distributed Computing Systems (ICDCS), 2002.
- ACM/SPIE Multimedia Computing and Networking 2002 (MMCN'02), January 18-25, 2002, San Jose, California.
- IFIP International Conference on Formal Methods for Open Object-Based Distributed Systems (FMOODS 2002), March 20-22, 2002, University of Twente.

- 9th IEEE International Conference on Network Protocols (ICNP 2001), Mission Inn, November 11 - 14, 2001, Riverside, California.
- Workshop on Optimizing Middleware, ACM Programming Language Design and Implementation (PLDI 2001).
- International Symposium on Distributed Objects and Applications (DOA) 2001.
- IEEE International Workshop on Parallel and Distributed Real-time Systems (WPDRTS 2001) to be held as a part of the IEEE International Parallel and Distributed Processing Symposium 2001 (IPDPS 2001).
- IEEE International Conference on Distributed Computing Systems (ICDCS), 2001.
- IEEE International Symposium on Cluster Computing and the Grid, 2001.
- ACM Multimedia Conference, 2000.
- Workshop on Parallel and Distributed Real-time Systems, International Parallel and Distributed Processing Symposium 2000 (IPDPS 2000).

## **Funding**

- Co-PI, NSF, “Collaborative Research: Dispatcher’s Assistant for Emergency First Response” 120K, 2008.
- Co-PI, DHS-FEMA Firefighter Safety Grant, \$1,000,000, 2008.
- Industry Gift, Nokia Research Labs, \$8K, 2008.
- Industry Gift (joint with Sharad Mehrotra), The School Broadcasting Company Inc., \$50K, 2007.
- Industry Gift, Nokia Research Labs, \$5K, 2007.
- Principal Investigator, “Collaborative Research: CSR-EHS: Modeling and Exploiting Cross-Layer Timing in Distributed Embedded Systems”, NSF, Total award: \$200,000, 2006-2009.
- Co-PI, “Responsphere: An IT Infrastructure for Responding to the Unexpected”, NSF, total award, 1.8 million, 2004-2009.
- Co-PI, “Disaster Portal”, NSF, total award 102K, 2005-2006.
- Co-PI, “Responding to the Unexpected”, NSF Large ITR, total award \$12.5 million, 2003-2008.
- Co-PI, “Adaptive Systems Interoperability”, ONR, total award \$5 million (\$890,000 – UCI), 2002 – 2007.
- Principal Investigator, “QoS-enabled Customizable Middleware for Global Distributed Computing”, NSF Career Award, total award \$402,656, 1999 – 2003.
- Co-Investigator, “MIRO: Adaptive Middleware for a Mobile Internet Robot Laboratory”, UC Mexus Program, total award \$40,000, 1999 – 2000. With Alfredo Witzenfield (PI).
- Principal Investigator, “Agent Based Middleware for Flexible Global Distributed Computing”, Hewlett Packard, total award \$40,000, 2000 – 2003.
- Co-Investigator, “Time Based Coordination of Network Embedded Nodes”, DARPA / AFOSR, total award \$1,455,560, 2001 – 2005. With Kane Kim (PI).
- Principal Investigator, “Workshop on Formal Methods for Open Object-Based Distribution Systems (FMOODS2000)”, NSF, total award \$10,000, 2000 – 2001.
- Principal Investigator, Novell Inc., total award \$160,000, 1999 – 2001.

- Principal Investigator, “E-speak Pilot”, Hewlett Packard, total award \$12,000, 2000.
- Equipment Awards for the Responsphere Infrastructure (approx \$250K value) -- Microsoft, IBM, Nokia, Motorola, The School Broadcasting Company, Canon, D-Link, Printronix, CDW-G, Walker Wireless, ViaSat, AMD, 5G Wireless, Ether2, NetPhone, Alliance of Foam Packaging Recyclers.
- Equipment Award, Hewlett Packard Company.
- Equipment Award, Novell Corporation.
- Equipment Award (ixMicro).
- Distance Learning Equipment Award.

### **Students Advising and Advised:**

#### Ph.D. advisees

- Mayur Deshpande (Ph.D. Spring 2007)
- Sebastian Gutierrez-Nolasco, (Ph.D. Summer 2007)
- Qi Han (Ph.D., Summer 2005)
- Shivajit Mohapatra (Ph.D., Summer 2005)
- Yun Huang (Ph.D. , Summer 2008)
- Jehan Wickramasuriya (Ph.D. expected Winter 2009)
- Vidhya Balasubramanian (Ph.D. expected 2008)
- Daniel Massaguer (M.S. 2005, Ph.D. 2009)
- Bo Xing (Ph.D. 2009)
- Leila Jalali (Ph.D. 2010)
- Minyoung Kim (co-advised with Nikil Dutt, Ph.D. 2008)
- Kyoungwoo Lee (co-advised with Nikil Dutt, Ph.D 2008)
- Hojjat Jafarpour (co-advised with Sharad Mehrotra, Ph.D. 2009)
- Jinsu Wang (Ph.D 2009)

#### M.S. advisees:

- Jonathan Cristoforetti (M.S. 2007)
- Suraj Nagasrinivasa (M.S. 2005)
- Humeyra Altintas (M.S. 2005)
- Xing Zheng (M.S. 2004)
- Mark Panahi (M.S. 2004)
- Henry Yan, (M.S. 2003)

- Bhaskar Chatterjee (M.S. 2002),
- Zhenghua Fu (M.S. 2001)
- Xiaoping Wei (M.S. 2001)

Selected Undergraduate Researchers:

- Amit Abhishek, Alfred Anguiano, Samuel Mandell, Christopher Bell, Jason Collins, Sadullah Nader, Michael Philpott, Preethi Srinagesh

International Exchange Research Students:

- Luca Clementi, Marco Domenichini, Jonathan Cristoforetti, Alessandro Ghigi.

## **Publications**

### Book Chapters

- BC-5 Jehan Wickramasuriya, Sharad Mehrotra and Nalini Venkatasubramanian. *RFID-Enabled Privacy-Preserving Video Surveillance : A Case Study*, RFID Handbook: Applications, Technology, Security and Privacy, To appear, 2008.
- BC-4 B. Hore, H. Jafarpour, R. Jain, S. Ji, D. Massaguer, S. Mehrotra, N. Venkatasubramanian and U. Westermann. "*SATware: Middleware for Sentient Spaces*", In "Multimodal Surveillance: Sensors, Algorithms and Systems", Ed. Zhigang Zhu and Thomas S. Huang, 2007.
- BC-3 Naveen Ashish, Rajesh Hegde, Charles Huyck, Dmitri Kalashnikov, Sharad Mehrotra, Padhraic Smyth and Nalini Venkatasubramanian. "*Situational Awareness Technologies for Disaster Response*". Terrorism Informatics: Knowledge Management and Data Mining for Homeland Security (Chen et al Eds), Springer, Sep 2007
- BC-2 Yun Huang, Shivajit Mohapatra, Qi Han and Nalini Venkatasubramanian, *QoS Aware Resource Discovery in Mobile Environments*, Chapter VI, The Handbook of Mobile Middleware (ISBN: 0849338336), A. Corradi and P. Bellavista eds., Chapman and Hall/CRC Press, September 2006
- BC-1 S. Mohapatra, C. Periera, N. Dutt, R. Gupta and N. Venkatasubramanian: *Energy-Aware Adaptation for End-to-end Video Streaming to Mobile Handheld Devices*. Ultra Low Power Electronics and Design. Chapter 14. Kluwer Academic Publishers, 2004.

### Journal Articles

- J-21 Kyoungwoo Lee, Aviral Shrivastava, Ilya Issenin, Nikil Dutt, and Nalini Venkatasubramanian, "Partially Protected Caches to Reduce Failures due to Soft Errors in Multimedia Applications", IEEE Transactions on Very Large Scale Integration (TVLSI) Systems, 2008, to appear.
- J-20 Minyoung Kim, Sudarshan Banerjee, Nikil Dutt, Nalini Venkatasubramanian, "*Energy-aware Co-synthesis of Real Time Multimedia Applications on MPSoCs*", ACM Transactions on Embedded Computing Systems (TECS), Vol 7, No. 2, Article 9, February 2008
- J-19 Qi Han, Nalini Venkatasubramanian, Sharad Mehrotra. *Application-aware Integration of Data Collection and Power Management in Wireless Sensor Networks*, Journal of Parallel and Distributed Computing (JPDC), Vol.67, Issue 9, September 2007.
- J-18 Iosif Lazaridis, Qi Han, Sharad Mehrotra and Nalini Venkatasubramanian, *Fault-Tolerant Evaluation of Continuous Queries over Sensor Data*, International Journal on Distributed Sensor Networks (IJDSN), accepted for publication.

- J-17 Liang Cheng, Shivajit Mohapatra, Magda El Zarki, Nikil Dutt and Nalini Venkatasubramanian, "*Quality-Based Backlight Optimization for Video Playback on Handheld Devices*," Journal on Advances in Multimedia, vol. 2007, Article ID 83715, July 2007.
- J-16 Shivajit Mohapatra, Nikil Dutt, Alex Nicolau, Nalini Venkatasubramanian, "*DYNAMO: A Cross-Layer Framework for End-to-End QoS and Energy Optimization in Mobile Handheld Devices*", IEEE Journal on Selected Areas in Communication (JSAC), Special Issue on Cross-Layer Optimized Wireless Multimedia, May 2007.
- J-15 Qi Han and Nalini Venkatasubramanian, *Timeliness-Accuracy Balanced Collection of Dynamic Data* , IEEE Transactions on Parallel and Distributed Systems (TPDS), Vol. 18, No.2, February 2007
- J-14 Minyoung Kim, Hyunok Oh, Nikil Dutt, Alex Nicolau, Nalini Venkatasubramanian, "*PBPAIR: An Energy-efficient Error-resilient Encoding Using Probability Based Power Aware Intra Refresh*", ACM SIGMOBILE Mob. Comput. Commun. Rev. 10(3): 58-69, 2006.
- J-13 Q. Han and N. Venkatasubramanian: *Information Collection Services for QoS-aware Mobile Applications*. IEEE Transactions on Mobile Computing (TMC), Vol.5, No.5, May 2006.
- J-12 S. Pasricha, M. Luthra. S. Mohapatra, N. Dutt and N. Venkatasubramanian: *Dynamic Backlight Adaptation for Low-Power Handheld Devices*. IEEE Design and Test of Computers, Special Issue on Embedded Systems for Real Time Embedded Systems. 2004.
- J-11 Nalini Venkatasubramanian, Carolyn Talcott, Gul Agha, "*A Formal Model for Reasoning about Adaptive QoS-Enabled Middleware*", ACM Transactions on Software Engineering and Methodology, ACM TOSEM 2004.
- J-10 Zhenghua Fu and Nalini Venkatasubramanian, "*An Evaluation of Composite Routing and Scheduling Policies for Dynamic Multimedia Environments* ", ACM Multimedia Systems Journal, 2004.
- J-9 Iosif Lazaridis, Qi Han, Xingbo Yu, Sharad Mehrotra, Nalini Venkatasubramanian, and Dmitri Kalashnikov, *QUASAR: Quality Aware Sensing Architecture*, ACM SIGMOD Record, March 2004.
- J-8 Qi Han, Sebastian Gutierrez-Nolasco, and Nalini Venkatasubramanian, *Reflective Middleware for Integrating Network Monitoring with Adaptive Object Messaging*, IEEE Networks (Special Issue on Middleware), 2004.
- J-7 Sudeep Pasricha, Shivajit Mohapatra, Manev Luthra, Nikil Dutt and Nalini Venkatasubramanian. "*Reducing Backlight Power Consumption for Streaming Video Applications on Mobile Handheld Devices*". Special Issue Journal of Korean Multimedia Society (KSSM), December 2003.
- J-6 Xingbo Yu, Koushik Niyogi, Sharad Mehrotra and Nalini Venkatasubramanian. "*Adaptive Middleware for Distributed Sensor Environments*", IEEE Distributed Systems Online, May 2003.
- J-5 Nalini Venkatasubramanian. "*Safe Composability of Middleware Services*", Communications of the ACM. June 2002.
- J-4 Qi Han and Nalini Venkatasubramanian. "*Aggregation Based Information Collection for Mobile Environments*", Journal of High Speed Networking, Vol. 11, No. 3-4, 2002.
- J-3 Qi Han and Nalini Venkatasubramanian. "*AutoSeC: An integrated Middleware Framework for Dynamic Service Brokering*", IEEE Distributed Systems Online 2001, Vol. 2, No. 7, 2001.
- J-2 Nalini Venkatasubramanian, Carolyn Talcott. "*A Semantic Framework for Modeling and Reasoning about Reflective Middleware* ", IEEE Distributed Systems Online, Vol. 2, No. 6, October 2001.
- J-1 Nalini Venkatasubramanian, Gul Agha and S. Miriyala, "*Scalable Concurrent Computing*", Journal of The Indian Academy of Sciences, March 1992.

#### Conference Papers:

- C-114 Hojjat Jafarpour, Bijit Hore, Sharad Mehrotra and Nalini Venkatasubramanian. "*Subscription Subsumption Evaluation for Content-based Publish/Subscribe Systems*", accepted in ACM/IFIP/USENIX Middleware 2008, Leuven, Belgium, December 2008.

- C-113 Ravi Chandra Jammalamadaka, Roberto Gamboni, Sharad Mehrotra, Kent Seamons, Nalini Venkatasubramanian. "DataGuard: An Interoperable Security Middleware for Untrusted Internet Data Storage", accepted in WiP Track, ACM/IFIP/USENIX Middleware 2008, Leuven, Belgium, December 2008.
- C-112 Kyoungwoo Lee, Aviral Shrivastava, Minyoung Kim, Nikil Dutt, and Nalini Venkatasubramanian "Mitigating the Impact of Hardware Failures on Multimedia Applications -- A Cross-Layer Approach", to appear in ACM International Conference on Multimedia (ACM MM 08), Oct. 2008.
- C-111 Minyoung Kim, Daniel Massaguer, Nikil Dutt, Sharad Mehrotra, Shangping Ren, Mark-Oliver Stehr, Carolyn Talcott, Nalini Venkatasubramanian, "A Semantic Framework for Reconfiguration of Instrumented Cyber Physical Spaces", Second Workshop on Event-based Semantics (WEBS'08) in conjunction with IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'08) in part of CPSWEEK, Apr. 2008, St. Louis, MO, USA.
- C-110 Jay Lickfett, Naveen Ashish, Sharad Mehrotra, Nalini Venkatasubramanian and Jacob Green. *The RESCUE Disaster Portal for Disasters and Emergency Response*, The 5th International ISCRAM Conference, May 2008, Washington DC.
- C-109 Kyoungwoo Lee, Aviral Shrivastava, Nikil Dutt, and Nalini Venkatasubramanian "Data Partitioning Techniques for Partially Protected Caches to Reduce Soft Error Induced Failures", IFIP Working Conference on Distributed and Parallel Embedded Systems (DIPES 08), Sep. 2008.
- C-108 Kyoungwoo Lee, Minyoung Kim, Nikil Dutt, and Nalini Venkatasubramanian, "Error-Exploiting Video Encoder to Extend Energy/QoS Tradeoffs for Mobile Embedded Systems", IFIP Working Conference on Distributed and Parallel Embedded Systems (DIPES 08), Sep. 2008.
- C-107 Yun Huang and Nalini Venkatasubramanian. *Mobile Data Overlay (MDO): A Data Placement Paradigm for Mobile Applications*, 9th IEEE International Conference on Mobile Data Management (MDM'08), 2008.
- C-106 Minyoung Kim, Mark-Oliver Stehr, Carolyn Talcott, Nikil Dutt, Nalini Venkatasubramanian, *Constraint Refinement for Online Verifiable Cross-Layer System Adaptation*, to appear in IEEE/ACM Design Automation and Test in Europe (DATE'08), Mar. 2008, Munich, Germany.
- C-105 Minyoung Kim, Nikil Dutt, Nalini Venkatasubramanian, Carolyn Talcott, "xTune: Online Verifiable Cross-Layer Adaptation for Distributed Real-Time Embedded Systems", SIGBED Review, Volume 5, Number 1, January 2008, Special Issue on the RTSS Forum on Deeply Embedded Real-Time Computing, Best Overall Idea Award & Best System Architecture Award at IEEE RTSS '07 Ph.D. Forum
- C-104 Ravi Chandra Jammalamadaka, Roberto Gamboni, Sharad Mehrotra, Kent Seamons, Nalini Venkatasubramanian. *DataGuard: A Middleware that Builds Secure Network Drives over Untrusted Internet Data Storage*, Demo Paper, EDBT 2008.
- C-103 Ronen Vaisenberg, Shengyue Ji, Bijit Hore, Sharad Mehrotra, Nalini Venkatasubramanian. *Exploiting Semantics for Sensor Re-Calibration in Event Detection Systems*, ACM/SPIE Symposium on Multimedia Computing and Networking, MMCN 2008.
- C-102 Jinsu Wang, Sharad Mehrotra and Nalini Venkatasubramanian. *PBCA - Prediction Based Channel Allocation*, Proceedings of IEEE Globecom 2007, December 2007.
- C-101 Minyoung Kim, Mark-Oliver Stehr, Carolyn Talcott, Nikil Dutt and Nalini Venkatasubramanian. *Combining Formal Verification with Observed System Execution Behavior to Tune System Parameters*, The 5<sup>th</sup> International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS 2007), Guest conference of the Embedded Systems Week (ESWEEK) 2007.
- C-100 B. Hore, H. Jafarpour, R. Jain, S. Ji, D. Massaguer, S. Mehrotra, N. Venkatasubramanian and U. Westermann. SATWare: Middleware for Sentient Spaces. IEEE Workshop on Multimodal Sentient Computing: Sensors, Algorithms and Systems ([WMSC 2007](#)) held in conjunction with CVPR 2007 conference. Best Student Paper Award.
- C-99 Ravi Chandra Jammalamadaka, Roberto Gamboni, Sharad Mehrotra, Kent Seamons, Nalini

- Venkatasubramanian. *gVault: A Gmail Based Cryptographic Network File System*. To appear in the proceedings of 21st Annual IFIP WG 11.3 Conference on Data and Applications.
- C-98 Yun Huang and Nalini Venkatasubramanian, "*MAPGrid: A New Architecture for Empowering Mobile Data Placement in Grid Environments*" Poster Paper, Seventh IEEE International Symposium on Cluster Computing and the Grid 2007,(CCGrid07), Brazil.
- C-97 Minyoung Kim, Mark-Oliver Stehr, Carolyn Talcott, Nikil Dutt, Nalini Venkatasubramanian, *A Probabilistic Formal Approach to Cross-layer Optimization in Distributed Embedded Systems*, IFIP Conference on Formal Methods for Open Object-Based Distributed Systems (FMOODS'07), Jun. 2007, Paphos, Cyprus., LNCS 4468 (pp. 285 - 300).
- C-96 Mayur Deshpande, Abhishek Amit, Mason Chang, Nalini Venkatasubramanian and Sharad Mehrotra. *Flashback: A Peer-to-Peer Webserver for Handling Flash Crowds* IEEE International Conference on Distributed Computing Systems (ICDCS). 2007
- C-95 Xingbo Yu, Sharad Mehrotra and Nalini Venkatasubramanian. *Sensor Scheduling for Aggregate Monitoring in Wireless Sensor Networks*, Proceedings of the International Conference on Scientific and Statistical Database Management (SSDBM) 2007.
- C-94 Bijit Hore, Hojjat Jafarpour, Ramesh Jain, Shengyue Ji, Daniel Massaguer, Sharad Mehrotra, Nalini Venkatasubramanian and Utz Westermann, "*Design and Implementation of a Middleware for Sentient Spaces*", Proceedings of IEEE ISI 2007.
- C-93 Mirko Montanari, Sharad Mehrotra and Nalini Venkatasubramanian. "*Architecture for an Automatic Customized Warning Dissemination System*", Proceedings of IEEE ISI 2007
- C-92 Yiming Ma, Dmitri Kalashnikov, Sharad Mehrotra, Nalini Venkatasubramanian, Ram Hariharan, Naveen Ashish and Jay Lickfett. "*On-Demand Information Portals for Disaster Situations*", Proceedings of IEEE ISI 2007.
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## **Software Systems/Releases:**

***CrisisAlert:*** An automated system to disseminate customized information to schools and other organizations in case of disasters. <http://www.ics.uci.edu/~projects/dissemination/artifacts.htm>,  
<http://www.disasterportal.org:8280/crisis/>

***RAPID:*** A P2P framework for flash distribution (over the Internet) of heterogeneous data to a large number of recipients in as short a time period as possible (Flash Dissemination) using an underlying minimum-state gossip-based protocol (CREW). <http://www.ics.uci.edu/~projects/dissemination/rapid.htm>

***Flashback:*** System for scalably handling large unexpected traffic spikes on web-sites where clients (browsers) create a dynamic, self-scaling Peer-to-Peer (P2P) web-server that grows and shrinks according to the load. <http://flashback.calit2.uci.edu/>

***Disaster Portal:*** An Emergency Information Portal (EIP) that includes a web-accessible integrated dashboard of local disaster and associated relief information, hotlinks for citizens and also an online donation management system. <http://www.disasterportal.org/ProjectWebsites/>, <http://www.disasterportal.org/Ontario/home.htm>

***pVault:*** A password management service that prevents some of the prevalent online attacks on passwords. <http://www.itr-rescue.org/pVault/>

***gVault:*** An application level cryptographic network file system built on top of the storage offered by Gmail(Web based email) service. <http://gvault.ics.uci.edu>

***dataVault:*** A system for Web users to securely access data from any machine connected to the Internet and selectively share data with trusted peers. <http://www.ics.uci.edu/~rjammala/dataVault>.

***SATWARE:*** SATware is a multimodal sensor data stream querying, analysis, and transformation middleware for sentient systems. <http://www.ics.uci.edu/~projects/SATware/>

***DrillSIM:*** is a multi-agent activity simulator for crisis response that models response activities and information flow at both the macro and micro level. <http://www.ics.uci.edu/~project/drillsim/>

***MetaSIM:*** A comprehensive platform for plug-and-play operation of simulation and modeling tools for emergency managers and first responders.

***Dynamo:*** A middleware framework (Linux based) for cross-layer adaptation of power-saving mechanisms at different layers – device (memory, backlight), OS, network, middleware and application for improved QoS and battery lifetime on low-power mobile devices. <http://www.ics.uci.edu/~dsm/dyn/release/>

***MAPGRID:*** A middleware framework built using Globus that exploits grid computing resources to support applications on mobile clients. <http://mapgrid.ics.uci.edu/SystemPrototype.htm>

***GURU:*** An MPEG-4 based distance-learning environment for users with visual, auditory and motor disabilities.

***CompOSE|Q:*** CompOSE|Q is a customizable distributed systems middleware infrastructure that allows safe integration and concurrent execution of resource management mechanisms for services such mobility, load balancing, fault tolerance and end-to-end QoS management. <http://www.ics.uci.edu/~dsm/compose/>