

Curriculum Vitae of Arun K. Somani

1. Personal Data:

Arun K. Somani

Anson Marston Distinguished Professor
Jerry R. Junkins Endowed Chair
Department Chair, Electrical and Computer Engineering
Director, Information Infrastructure Institute
Department of Electrical and Computer Engineering
Iowa State University, Ames, IA, 50014
Tel: (515) 294-0442, Fax: (515) 294-8432
e-mail: arun@iastate.edu

2. Education Record:

- PhD in Electrical Engineering, September 1985, *McGill University, Montreal, Canada*
- MSEE in Electrical Engineering, September 1983, *McGill University, Montreal, Canada*
- M.Tech. in Computer Engineering, August 1979, *Indian Institute of Technology, Delhi, India*
- B. E. (Hons.) in Electronics Engineering, June 1973, *B. I. T. S., Pilani, India*

3. Professional Appointments:

3.a. Iowa State University:

- Anson Marston Distinguished Professor, Iowa State University, Electrical and Computer engineering, (August 16, 2007 - Contd.).
- Chair, Electrical and Computer Engineering, (May 15, 2003-Contd.). Duties include managing the overall responsibilities of the department, a state budget of approximately \$8.0 Million and a research budget of approximately \$9.0 Million per year, 45 faculty and about 20 staff members.
- Director, Information Infrastructure Institute (2002-Contd.).
- Jerry R. Junkins Endowed Chair Professor of Electrical and Computer Engineering (August 16, 2002 - August 15, 2012). Develop innovative research program in computer engineering areas.
- Associate Chair for Resources (August 16, 1999-2003). Duties included teaching, teaching assistant, and space assignment and management of computing and electronics laboratory resources (more than \$500K budget).
- David C. Nicholas Professor of Electrical and Computer Engineering (1997 - 2002). Develop innovative research program in computer engineering areas.

3.b. Prior to Iowa State Appointment:

- University of Washington, Seattle, WA 98195
 - Assistant Professor of Electrical Engineering (September 16, 1985 - September 15, 1990).
 - Associate Professor of Electrical Engineering and Computer Science and Engineering (September 16, 1990 - September 15, 1995).
 - Professor of Electrical Engineering and Computer Science and Engineering (September 16, 1995 - June 15, 1997).
 - Professional (Sabbatical) Leave: December 16, 1994 - December 15, 1995 to I. I. T. Delhi, India, University of Newcastle, Newcastle, Australia, and ICASE, Hampton, VA.
- Computer Group, Electronics Corporation of India Limited: Technical Officer (November 73 - November 74). Worked on design and development of micro-programmed CPU's.

- Systems Group, Dept. of Electronics, Govt. of India: Junior Scientific Officer (December 74 - July 79). Design, development, implementation, and testing of a state-of-the-art anti-submarine warfare (ASW) system for Indian Navy.
- Systems Group, Dept. of Electronics, Govt. of India: Senior Scientific Officer (August 79 - August 82). Leadership role in design and system integration of a state-of-the-art anti-submarine warfare (ASW) system for Indian Navy. The system was designed, implemented, tested, and was proved to Indian Navy. It was installed on two frigates and a third system was delivered to navy for training.

3.c. Consulting and Professional Practice:

- Boeing Commercial Group, Seattle, WA: January 1, 1993 - 2000.
- ICASE, Langley, VA: January 1, 1993 - 1997.
- Elsevier July 1, 1994 - Dec 31, 2006.
- Guidant July 1, 1999 - Dec 31, 2001.
- Rockwell January 1, 2002 - December 31, 2002.

4. Honors and Awards:

- Anson Marston Distinguished Professor, Iowa State University, 2007.
- First Recipient of Jerry R. Junkins Chair Professorship, Iowa State, 2002-2012.
- First Recipient of David C. Nicholas professorship, Iowa State, 1997-2002.
- Elected Fellow of IEEE for “contributions to theory and applications of computer networks,” 1999.
- Distinguished Engineer of ACM, 2006. Requires at least 15 years of professional experience who have achieved significant accomplishments or have made a significant impact on the computing field.
- Received ISU’s Department Leadership Award, 2008.
- Dean’s Honor list at McGill University 1985 (Ph.D.). Reserved for top few dissertation.
- Dean’s Honor list at McGill University 1983 (M.Eng). Reserved for top few theses.
- Best Teacher Award, Student Association, ISU, 1999.
- Warren B. Boast, Undergraduate Teaching Awards, Electrical and Computer Engineering, ISU, 2006.
- Keynote and Banquet speaker at many conferences.
- Distinguished Visitor for IEEE (2000-2002).
- Distinguished Tutorial Speaker for IEEE (2000-2002).
- Have won several best/top paper awards
- Recipient of Commonwealth Scholarship, Canada 1982-1985
- Recipient of National Scholarship, India 1967-73.
- Listed in several volumes of Who’s Who.

5. Teaching Activities: Have taught a variety of courses as listed below.

- Introduction to Digital Logic Design. A standard course on introduction and application of digital logic design and combinational and sequential circuits for various applications. I developed and introduced a new laboratory in the course that uses Altera FPGA-based logic design boards for rapid prototyping and PowerPC based boards in a follow on course on microcontroller applications.
- Introduction to Micro Processors. This is a standard course on architecture and applications of Micro processors for various application, including input/output, direct memory access and interrupt programming.

- Computer Organization and Design, Computer Architecture and Structure. Have taught this course in various forms and revised it regularly to introduce new state-of-art tools and laboratory components in the course in a timely manner. Initially I used a microprogramming laboratory where student will design and implement an instruction set architecture as part of the course. Reorganized the laboratory to include various microprogramming engines such as HP 3000, which were then followed by Texas Instruments EVM-16 board that used 16-bit data path. Subsequently introduced Verilog simulation engine in the same course both at UW (EE471 and CSE471) and ISU (Cpre305). The course is very well-liked by students.
- Vertical Integration of Engineering Education (VIE) sequence on Introduction to Digital Logic Design, Microprocessor Applications and Computer Organization and Architecture. This curriculum of two experimental instructional and laboratory classes over a two semester period provided several advantages to the students in experimental classes. It was taught for two academic years, 2004-05 and 2005-06. In each year a controlled group of 20 (representative of student population) students was selected and were taught material typically covered by a 3-course 4-credit sequence as a 4-course 2-semester sequence. The result showed that student learning improved significantly. This material was then then adopted as a regular sequence in computer engineering curriculum at Iowa State University as CprE 281/CprE 381 sequence.
- VLSI Testing. A conventional course of VLSI testing techniques. Co-taught it with Dr. Mani Soma at the University of Washington.
- Advanced Computer Architecture. An advanced standard course on computer architecture suitable for entering graduate students.
- Fault-Tolerant Computer Systems. Developed a new graduate course on Fault-Tolerant Computer Systems design. First offering was in 1986. Boeing Company found the course contents very useful and bought the entire course on video cassettes for their training center. he course was a regular course in curriculum at UW and is now a regular course at ISU. Also set up a new laboratory for research in fault tolerant computing area, which is equipped with state-of-art computing equipment and tools for simulations and evaluations. We also developed analysis tools and techniques that are now used by industry.
- Parallel Computer Systems. Revised and upgraded the contents of the course on Parallel Computer Systems to reflect the state of art in parallel computer systems. In particular, when I designed and built the Proteus multi-computer system, we used a real system for programming.
- VLSI ARRAY Processors. Developed a course in using large scale VLSI systems on a chip for various regular applications in 1988. It was a timely course and included material on how to explore an algorithm for parallelization, how to express them in data and signal flow forms, and map them on regular VLSI structures on a chip.
- FPGA-Based Adaptive Computing Systems. Jointly developed this timely new graduate-level course on using reconfigurable components such as Field Programmable Gate Arrays to map algorithms directly onto the hardware in 1998. The course is a regular course in ISU curriculum now.

6. Research Activity:

6.a. Contributions: Have made the following significant research contributions.

- Developed novel architectures for an efficient dictionary machine for VLSI. This is a direct implementation of a data structure in a large scale VLSI system chip. The technique we developed uses a simpler control structure and thus makes it easily implementable.
- Made fundamental and significant contribution in developing a generalized theory for system-level diagnosable system in the presence of an arbitrary fault set in a multi-computer system. Characterized such diagnosable systems in terms of their testing requirement under various model of test result interpretation and faults scenarios where multiple faults occur sequentially or simultaneously. Developed distributed fault diagnosis algorithms for multi-processor systems that exploit the interconnection topology, its regularity and symmetry, for diagnosing multiple faults in size much larger than that is possible using the prevalent classical theory. The work led to development of several probabilistic and deterministic fault diagnosis approaches. These models allow design of practical systems.

- Developed a new fault tolerant computer system architecture, called MESHKIN, based on distributed fault diagnosis and reconfiguration approach to tolerate multiple faults while minimizing the hardware complexity and performance penalty while maintaining very high reliability. The Boeing company implemented a fault tolerant computer system based on this work.
- Interconnection topologies play important role in development of parallel and distributed multi-computer systems. Developed Enhanced Hypercube (EHC), Generalized Folding Cube (GFC), and Helical Binary-cube (HBC) interconnection topologies that are universal structures for embedding any arbitrary permutation routing requests in circuit switched mode. Also developed Extra stage and Reduced stage multi-stage interconnection structures for robust and fault tolerant operation to interconnect multi-computer systems.
- Developed, designed and implemented Proteus multi-computer system – a fully reconfigurable high performance computer system – for computer vision applications using mathematical morphology for Coastal Navy. This system used a large grain message passing network model at high level and used shared memory multiprocessor node at the lowest level with software controlled cache coherency architecture. Several ideas to optimize cache design for this application, which can be generalized for parallel processing, were developed and deployed. The system architecture allowed to include spare capacity for fault detection, diagnosis, and reconfiguration. A 46-node system prototype was built and experimented with at the University of Washington. A patent was issued for the novel ideas in this architecture. Several programming approaches and methodologies were developed and deployed the Proteus machines. The network deployed time-slotted circuit-switched connection structure with separate data and control plane.
- Analyzing reliability of complex systems that operate in multiple phases with different requirements and follow complex maintenance schedules is an extremely complex task. Examples include commercial and military aircraft systems, and NASAs shuttle systems. To respond to this need, as part of research supported by the Boeing Company, developed techniques for analysis of phased-mission and scheduled-maintenance systems. These techniques were incorporated in tools such as EHARP (Enhanced Hybrid Automated Reliability Predictor) and HIMAP (Hierarchical Modelling and Analysis Package). The Boeing Company used this tool to analyze systems including Inertial Upper Stage (IUS) Systems, chip-level-redundancy (CLR) computer systems, and various subsystems in commercial aircrafts. Several other companies such as Boeing (various divisions), Singapore Defense, Honeywell, GE Locomotive division, Lucent, and the University of Massachusetts, University of Arizona, University of Texas at Dallas, and ISU, also use these tools for analysis and education
- Dependability of computer systems in the presence of transient and soft faults is a major concern in current and future processor and memory system designs. We studied the error propagation characteristics due to transient faults in processor registers, logic, and cache memories. Developed low-overhead techniques such as shadow caching for multi-bit error correction in (cache) memory system and both circuit and logic level error detection and correction in processor systems to make them more robust. This research will have high impact on high performance robust computer system design. Also developed a novel concept of reconfigurable caches/functional units integrated in micro architecture to achieve a balance processor and memory bandwidths.
- Developed an efficient fault tolerant location management distributed database system. This scheme distribute the location update and search workload on multiple distributed database systems to optimize the search and update time. A patent has been issued for this research.
- Have made significant research contribution in design and operation of fiber optics based optical networks. Characterized the role of wavelength converters in optical WDM (wavelength division multiplexing)-based network and design of such networks. It has been shown that converters do not play significant role in dense and sparse networks. For other topologies, where wavelength conversion is useful, we have developed computationally efficient algorithm to identify the placement of wavelength conversion. This work has been widely used by other researchers.
- Since wavelength conversion remains expensive, we have developed alternate architectures that employ no wavelength conversion. Example include multifiber-based link design, traffic grooming networks, and wavelength allocation optimization. In particular, we have developed multifiber-based link architecture as a very viable option and have shown that by replacing a fiber link with W wavelength channels with

k fibers each with W/k wavelength channels each removes the necessity of wavelength conversion. This is also a very cost-effective solution.

- To take care of smaller traffic granularity in ever increasing available channel capacity, we have developed traffic grooming architectures and algorithms at wavelength and sub-wavelength level in optical WDM-based network. We have developed techniques to route, carry out resource allocation, and provide fault tolerance to support efficient traffic grooming.
- Another major focus of our research has been on developing dependable routing and connection management issues at wavelength- and sub-wavelength-level in optical WDM-based networks. We have developed optimization techniques to efficiently manage backup multiplexing and resource utilization in such networks. Also investigated techniques and methods to detect and diagnose attacks in WDM-based fiber optic networks. We have developed a simulation environment to analyze the effectiveness of the techniques.
- We have investigated developing reconfigurable architectures that are based on FPGA-like memory lookup-based computing techniques. In particular, we have developed architectures that can trade cache memory to become functional units in a general purpose computing system. This adaptive balanced computing system allows efficient use of resources in a dynamic computing environment.
- Peer-to-peer (P2P) networks are flexible distributed systems that allow nodes (called peers) to act as both clients and servers. P2P is a powerful emerging networking paradigm as it permits sharing of virtually unlimited data and computational resources in a completely distributed, fault-tolerant, scalable and flexible manner. The current research in P2P systems is based on a cooperative network model. The network designers need to take into account the independence and selfishness of P2P users to make the future systems reliable and robust. Our research efforts are focused on harnessing idle processing resources in P2P networks taking into account the selfishness of the nodes. In this context we developed CompuP2P, which is architecture for distributed computation that facilitates trading of computing power using an incentive driven economic model.
- Power Grid Protection. Conventional control and protection mechanisms on power transmission networks are blind sided in recognizing and responding to physical threats to the power system including but not limited to sabotage, and acts of nature. These safety mechanisms are based purely on electrical quantities and the operator will not have knowledge of attacks on the system that physically alter the transmission path, which is considerably common occurrence. We have developed distributed computerized automatic early warning and control system via wireless sensor technology to assess the mechanical health of power transmission hardware. A sensor network that monitors the energy network in such a way that the sensors can make a wide array of measurements and take remedial actions. The system is self diagnosing. Relations between the measurements can be exploited for further fault classification.
- Beyond Arithmetic Carry Chain: Logic Chain for FPGA Architecture. We have developed new architectural concepts to enhance the performance of look-up table based FPGAs. Our solution, called ChainMap, is a polynomial-time delay-optimal technology mapping algorithm for the creation of generic logic chains. By using the carry chain as a generic, near zero-delay adjacent cell interconnection structure for 4/5/6-LUTs, average speedups of between 1.4x-1.7x can be realized with an average LUT utilization penalty of 1.00-1.24x. Using this we make a case for generalization of CarryChain in FPGA to a LogicChain based design.
- To improve the performance and reliability of processor systems we have developed a design methodology to overcome the clock rates upper bound that is determined using the worst case timing paths to avoid timing errors. Process, Voltage and Temperature (PVT) variations also force designers to fix clock-times of embedded processors and system-on-chips at much higher value than what is typically required. In practice, most applications running in a given operating environment do not exert the critical path every cycle, leaving room for significant performance improvements that can be achieved through dynamically adjusting clock frequency at run time beyond worst case limits. We have developed a framework to make a balance between clock speeds, performance, power consumption, and thermal management on a chip.

6.b. Student Research Supervision:

6.b.1. PhD Student Supervision:

1. SangBang Choi (Sum 90), "Hypercube Architectures to Embed Arbitrary Permutations." Committee members: Professors James S. Meditch (EE), M. Soma (EE), Robert J. Marks (EE), and J. Baer (CSE). Currently a Professor at the Inha University, Korea.
2. Garrison Greenwood (Sum 92), "A Methodology for Mapping Pipelined Algorithms onto Hypercube Array." Committee members: Professors G. Borriello (CSE), M. Soma (EE), L. Shapiro (CSE/EE), V. Klee (Mathematics), J. Hwang (EE). Currently at Portland State University, Portland OR.
3. Craig Wittenbrink (Spr 93), "Designing Optimal Parallel Volume Rendering Algorithms." Committee members: Professors T. Derose (CSE), R. Haralick (EE), L. Shapiro (CSE/EE), M. Gantor (ME). Currently at the nVideo Labs.
4. C. Chen (Sum 93), "High-Performance High-Integrity System design: Architectural Tradeoff Methodology and A Cache Error Recovery Protocol." Committee members: Professors J. Baer (CSE), L. Shapiro (CSE/EE), M. Soma (EE). Currently an Associate Professor at the National Yunlin Institute of Technology, Touliu, Yunlin, ROC of Taiwan.
5. Kisang Song (Sum 94), "Fault Tolerant ATM Backbone Network Design and Resource Management of LAN/MAN Interworking." Committee members: Professors J. Meditch (EE), G. Zick (EE), E. Riskin (EE), Grad School Rep. He is going to join Electronics and Telecommunication Research Institute (ETRI) at Taejeon Science Town, Korea.
6. David Fura (Aut 94), "Abstract Interpreter Modeling and Verification Methods for Dependable Embedded Hardware Systems." Committee members: Professors G. Borriello (CSE), M. Soma (EE), L. Shapiro (CSE/EE), A. Shaw (CSE). Has his own small scale business based on his dissertation work.
7. Tushar Sarnaik (Passed Qualifying and General Examinations, did not complete the final defence due to job situation), "HUV Concept: Applications and Performance." Committee members: Professors J. Baer (EE), M. Soma (EE), W. Moritz (EE).
8. Suresh Subramaniam (Sum 1997), "Role of Wavelength Converters in all-optical networks." Committee Members: Professors J.S. Meditch, M. Azizoglu, Richard Ladner, E. Riskin. Currently working as an Associate Professor at George Washington University.
9. Govindrajan Krishnamurthy (Sum 1999), "Location management and fault Tolerance Issues in Mobile Networks." Committee Members: Professors Soma Chaudhari, Doug Jacobson, Julie Dickerson. Works for Nokia Research, Boston. Received Research Excellence Award.
10. Li Ling (Spring 2000), "Dynamic Wavelength Routing in Multifiber WDM Networks." Committee Members: Professors Satish Udpa, Jim Davis, G. Manimaran. Works for CIENNA, Boston. Received Research Award.
11. Raed Al-Omari (Sum 2001), "Controlling Schedulability-REliability Trade-Offs in REal Time Systems." Committee Members: Professors G. Manimaran, Murti Salapaka, S. Chaudhuri. Works for IBM Research, Austin. Received Research Excellence Award.
12. Huesung Kim (Sum 2001), "Towards Adaptive Balanced Computing (ABC) using Reconfigurable Caches (RFC)." Committee Members: Professors G. Manimaran, A. Tyagi, G. H. Lee, S. Kothari. Works for Intel, Austin. Received Research Excellence Award.
13. Sashisekaran Thiagarajan (Fall 2001) "Traffic Grooming and Wavelength Conversion in Optical Networks." Committee Members: Professors G. Manimaran, A. Kamal, S. Chaudhuri, R. Weber. Works for Cienna Research, Baltimore. Received Research Excellence Award.
14. Seongwoo Kim (Fall 2001) "Integrity Monitoring in Microprocessor." Committee Members: Professors A. Tyagi, G. Lee. S. Kothari. Works for Intel, Portland. Received Research Excellence Award.

15. S. Ramasubramanian (Sum 2002) “A Generalized Framework for Analyzing Time-Space Switched Optical Networks.” Committee: Professors G. Manimaran, A. Kamal, R. Weber, and S. Sethuraman. Faculty member at University of Arizona. Received Research Excellence Award.
16. M. Sridharan (Sum 2002) “Design and Operation of Mesh-Restorable WDM Networks.” Committee: Professors G. Manimaran, M. Salapaka, A. Kamal, and S. Chaudhuri Works for Microsoft, Seattle, WA.
17. Rama Sangireddy (Sum 2003) “On-Chip Adaptive Components for Balanced Computing.” Committee: Professors A. Tyagi, S. Kothari, M. Chang, and D. Fernandez-Baca. Faculty member at University of Texas, Dallas. Received Research Excellence Award.
18. Tao Wu (Sum 2003) “Attack Monitoring & Localization in All-Optical Network.” Committee Member: Professors A. Kamal, B. Ramamoorthy, D. Jacobson, S. Chaudhury, G. Mainmaran. Works for Microsoft, Seattle, WA. Received Research Excellence Award.
19. Jing Fang (Fall 2004) “Traffic Grooming in IP over WDM Optical Networks.” Committee Member: Professors A. Kamal, S. Chaudhury, G. Mainmaran, M. Mina. Works for Agnomy department, Iowa State University. Received Research Excellence Award.
20. Pallab Datta (Sum 2005) “Survivability Approaches for Multiple Failures in WDM Optical Networks.” Committee Member: Professors A. Kamal, S. Chaudhury, G. Mainmaran, M. Mina. Works for Sandia National Research Laboratory. Received Research Excellence Award.
21. Rohit Gupta (Sum 2005) “Protocols for Sharing Computing Resources and Dealing with Nodes’ Selfishness in Peer-to-Peer Networks.” Committee Members: Professors A. Tyagi, T. Daniels, D. Jacobsons, S. Tirathapura, J. Wang. Works for Amazon Company. Received Research Excellence Award.
22. Wensheng He (Sum 2006) “Survivable design in WDM mesh networks.” Committee Members: A. Kamal, G. Mainmaran, D. Jacobson, and L. Ruan. Works for software industry.
23. Nathan Vanderhorn (Spring 2007) “Fiber Optic Networks: Access Controls, Fairness and Prototyping.” Committee Members: A. Kamal, M. Mina, R. Weber, and C. Bergman. Works for Rockwell Collins, Cedar Rapids, IA.
24. Srivatsan Balasubramaniam (Spring 2007) “Design and Protection Algorithms for Path Level Aggregation of Traffic in WDM Metro Optical Networks.” Committee Members: A. Kamal, L. Ruan, R. Weber, D. Fernandez Baca. Works for CISCO, San Francisco.
25. Michael Frederick (spring 2008) “Beyond the Arithmetic Constraint: Depth-Optimal Mapping of Logic Chains in LUT-based FPGAs.” Committee Members: A. Tyagi, D. Rover, J. Zambreno, S. Aluru, and D. Fernandez-Baca.
26. Viswanathan Subramaniam (Fall 2009) “Timing Speculation and Adaptive Reliable Overclocking Techniques for Aggressive Computer Systems.” Committee Members: A. Tyagi, R. L. Geiger, J. A. Zambreno, D. Fernandez-Baca, S. K. Gadia.
27. Koray Celik (Summer 2010) (passed Preliminary Examination).
28. Jinxu Ding (fall 2010) (passed Qualifying Examination).
29. Prem Kumar Ramesh (spring 2011) (passed Qualifying Examination).
30. David Lastine (summer 2011) (passed Qualifying Examination).
31. Lizandro Damian (summer 2012) (passed Qualifying Examination).
32. Prashad Avirneni (summer 2012) (passed Qualifying Examination).
33. Cory Kleinheksel (summer 2013) starting in fall 2009 with an NSF Fellowship.

6.b.2. MSEE/MSCS Students Supervision:

1. SangBang Choi (Aut 87), "Performance and Reliability Analysis of Some Fault-Tolerant Multistage Interconnection Networks."
2. Glen Fujimori (Win 88), "Logical Decomposition of System-Level Requirements, Potential Problems and Some Design Solutions for Fault Tolerant Distributed Computing Systems."
3. Saurabh Sonawala (Win 88) "An Echo-Back Bus Protocol for Fault-Tolerant Computer Systems."
4. Phyllis Li (Spr 88), "Comparison of the Hypercube-based Compact Neural Network With Other Artificial Neural Networks."
5. Steven Yee (Sum 88), "Interpolated Character Generation."
6. Narong Penla (Sum 88), "Reduced Interconnection Neural Networks and a Simulation Environment to Study Them."
7. Merat Bagha (Aut 88), "Meshkin: A Distributed Fault Tolerant Computer Architecture."
8. Godfrey D'Souza (Aut 88), "Diagnosis and Consensus in Distributed Systems"
9. Duane Koehler (Aut 88), "STEED - A Testability Enhancement Expert Design System."
10. Joseph Ho (Win 89), "Specification and Process Scheduling for Real-Time Computing."
11. Derek J. Van Alen (Spr 89), "An All Digital Phase Locked loop Implementation of a Fault Tolerant Clock."
12. Bert Sullam (Spr 89), "Implementation Issues in a Mesh-Based Fault Tolerant Computer Architecture."
13. Ho Shyan Lin (Sum 89), "High-Performance Comparison-Based Cache-Aided Rollback Recovery Computing Systems."
14. Katherine Buhler (Sum 89), "Design of Dependable Broadband Switching Architectures."
15. Min Lee (Aut 89), "A Comparative Study of Synchronous and Non-Synchronous Transmission Algorithm on a Replicated Token Bus Network."
16. Anatoly Menn (Aut 89), "An Efficient Sorting Algorithm for the Star Graph Interconnection Network."
17. Sanjay Thatte (Wint 90) , "Helical Hypercube."
18. Virgil Bourassa (Spr 90), "The MaRFT and RPM - Massively Redundant and Reconfigurable Architectures for Fault-Tolerant/Parallel Computing."
19. Glenn Yu (Spr 90), "An Incremental Distributed Diagnosis Algorithm for Multiprocessor Systems."
20. H. Stephen Au (Sum 90), "Phased Mission Reliability Analysis."
21. Alex Bobotek (Sum 90), "An Inherent-Testability-Analysis Technique for Digital Design."
22. Craig Wittenbrink (Sum 90), "Directed Data Cache for High Performance Image and Graphics Processing."
23. Tushar Sarnaik (Aut 90) "Analysis and Comparison of Two Fault Tolerant Computer Architectures."
24. D.D. Nguyen (Aut 90) "Achieving Fault in Memory-Processor Communication."
25. Tuan Le (Win 91), "A design and Analysis of Fault Tolerant Digital Autonomous Terminal Access Communication."
26. Mike A. Csoppensky (Sum 91) "Efficient Distributed Routing Algorithms for a Synchronous Circuit-Switched Hypercube."
27. Linda Bender (Sum 91) "A Performance Comparison of the MIPS R4000 and Intel i860."

28. Jay Choi (Aut 91) "Linear Chains Allocation in Hypercubes."
29. Theodore Yeung (Aut 91) "ARINC 629 Buses in A Fault Tolerant Integrated Modular Avionics Systems."
30. Mike Harrington (Aut 91) "Synchronizing Distributed Networks in the Presence of Faults."
31. Farid Mamaghani (Win 92) "Parallel Algorithms and Pipelined Architectures for Determination of Line of Sight Visibility."
32. Han K. Gim (Win 92) "Software Fault Tolerance: Research and Applications."
33. Samir Palnitkar (Spr 92) "Reliability Modeling of latent and Blind Failures in Scheduled Maintenance Systems Using Markov Chains."
34. J. Wang (Spr 92) "Probabilistic Diagnosis in Wafer Scale Systems."
35. TianMing Zhang (Spr 92) "Achieving Almost-Free Fault Tolerance in Dilated Banyan Networks."
36. Tuan Phan (Wint 93) "Programming Vision Algorithms on Proteus."
37. Upender Reddy (Sum 93) "Exploring Idle Capacity for Fault Diagnosis in Multiprocessor Systems."
38. Alok Gupta (Win 94) "Transient fault Detection in Computer Network using SNMP Protocol."
39. Benjamin Sklar (Spr 94) "Ray Tracing: Parallelization via Image Decomposition and Performance Impact."
40. Kevin Simonson (Aut 94) "Sorting Machines."
41. Girija Govind (Win 96) "Simulation and Analysis of Fault-Tolerant Caching Schemes."
42. Allen Sansano (Win 96) "Minimizing Overhead in Parallel Algorithms Through Overlapping Communication/Computation and Its Implementation on the Proteus Parallel Computer."
43. Seongwoo Kim (Aut 96) "Shadow Caching for Cache Fault Tolerance."
44. A. Anand (Spr 97) "Shadow Caching for Cache Fault Tolerance."
45. T. Sakaguchi (Spr 97) "Shadow Caching for Cache Fault Tolerance."
46. M. Bhaskar (Win 98) "Performance Improvement for TCP During Interference in Mobile Computing."
47. D. Deshpande (Fall 98) "Configuration Scheduling Schemes for Striped FPGAs."
48. Wei Zhao (Sum 1999) "Hierarchical Petri net Description Methods."
49. Indu Peddibothala (Sum 1999) "Experimental Verification of IRTCP."
50. Sudheer Matta (Spr 2000) "Mobile Aware IRTCP."
51. Jim Ng (Spr 2000) "A Heuristic Approach to Variable Ordering in Binary Decision Diagrams."
52. Joel Nickel (Fall 2000) "REESE: A Method of Soft Error Detection in Microprocessors."
53. Zulfiqar Hussain Sarosh (Fall 2000) "Configuration cache-Management systems for Striped FPGAs."
54. Liang Zhang (Spr 2001) "A Real Time Music Recognition and Display System."
55. Jian-Wei Zhou (Sum 2001), "A New Localize Approach to Distributed Fair Scheduling in Multihop Wireless Networks." s for Intermediate Processing at Routers in the Internet."
56. Dazhi Zhang (Sum 2002), "Fairness and Fairness, An Interpretation and Application in Ad-Hoc Wireless Networks."
57. Aaron Cordes (Sum 2002), "Parallelization of Image Processing Applications."
58. Nathan Vanderhorn (Fall 2002), "RDF network: A high-speed option for Metropolitan Area Networks."

59. Wheng-Sheng He (Fall 2002), "Capacity Optimization for Surviving Double-Link Failures in Mesh-Restorable Optical Networks."
60. Mike Frederick (Fall 2002), "A Single FAult Recovery Strategy for Optical Networks Using Subgraph Routing."
61. Adeel Israr (Fall 2002), "CBCA: Balanced Cache Checkpointing for Superscalar Processors."
62. Rakesh Raghavan (Spring 2003), ICEI TCP: Implit Congestion and Explicit Interference Detection in TCP."
63. Jinran Chen (Spring 2003), "Fairness in Wireless Ad-Hoc Network in the Presence of Channel Errors."
64. Nitin Jose (Sum 2003), "Connection rerouting for network reconfiguration."
65. Yana Ong (Sum 2005), "Iowa State Optical Simulator (ISTOS): Design, Architectures and Features."
66. V. Sekhri (Sum 2005), "CompuP2P: A Light-Weight Architecture for Internet Computing."
67. G. Subramaniam (Spring 2006), " Control Caching: A fault-tolerant architecture for SEU mitigation in microprocessor control logic."
68. M. Bezdek (Sum 2006), "Utilizing timing error detection and recovery to dynamically improve super-scalar processor performance."
69. D. Lastine (Spring 2007), "An examination of single link failure in an optical network with full grooming."
70. Kamna Jain (Fall 2007), "D-RDF: Dynamic Resource Description Framework."
71. Zachary Schmid (summer 2009) M. Eng.
72. Kritanjali Balakrishanan (summer 2009) Eng.
73. Nishant Reddy (summer 2009) "Network coding in Wireless Networks."
74. Pavan Gorti.
75. M. Ganesh.
76. Suresh Shankaran.
77. Harini Sundararaman.

6.b.3. Undergraduate Students Supervision:

- Several students every year. Most noticeable is a publication in IEEE Transactions on Education.
- Routinely employ 3-4 undergraduate students as part of the NSF's research experience for undergraduate (REU) program.
- Supervise one senior design project every year. The senior design in Fall-2004/Spring-2005 entered in an IEEE Innovative Project Competition was ranked among the top in the world and 2nd best in the country.
- Year 2005 Senior Design Group made it to top 10 teams world wide in IEEE CSDIC competition.

6.c. Research Proposals or Grants:

6.c.1. Current Sponsored Research:

1. NSF, "CSR: Small: Meta Analysis Directed Execution," 9/1/09-12/31/10, Seed funding \$100,000, (Co-PI with Drs. A. Tyagi and S. Gadia).
2. NSF, "EFRI-RESIN: 21st Century National Energy and Transportation Infrastructures: Balancing Sustainability, Costs, and Resiliency (NETSCORE-21)," 9/16/08-9/15/12, Total funding \$1,983,226, (Co-PI with Drs. J. McCalley (lead PI), K. Gkritza, L. Wang, and D. Aliprantis).
3. NSF, "CSR-DMSS, SM: Design and Evaluation of a Scalable Meta-Event Dissemination System," 9/1/08-9/1/11, Total funding \$432,000, (Co-PI with Dr. S. Tirthapura).
4. NSF, "CRI: IAD Acquisition of a cluster and high performance storage for data-intensive applications in Materials Science, Power Systems and Systems Biology," 4/1/08-4/1/11, Total funding \$719,000 + match of \$400,000 from ISU sources, (Co-PI with Drs. Aluru (lead PI). J. McCalley, and M. Aluru).
5. Dept. of Education, "Graduate Assistantship in the Area of National Needs (GAANN)," 8/16/06-8/15/10, Total funding \$520,000.
6. NSF, "NeTS-NBD: Survivable Multipoint Traffic Grooming in Optical Networks," 8/1/06-8/1/10, Total funding \$306,000, (Co-PI with Dr A. Kamal).
7. ISU, "ICUBE: Information Infrastructure Institute," A Presidential initiative at ISU funded to support a faculty position and research support, (PI with Co-PIs Drs. V. Vittal and S. Kothari), 8/16/02-8/15/11, \$400,000. Additional support of \$100,000 per year.
8. Jerry R. Junkins Chair, ISU, Approximately \$75,000/year from ECPE department, 2002-2012.

6.c.2. Completed Sponsored Research:

1. NSF, "NeTS-NR: Evolutionary architectures for ultra-broadband access networks," 9/01/04-8/31/09, Total funding \$450,000, ISU Funding \$162,075. (PI from ISU in collaboration with Co-PI S. Subramaniam of GWU and S. Ramasubramaniam of UA). Additional REU support of \$12,000.
2. NSF, "SST-Sensor Network Design For A Secure National Electric Energy Infrastructure," 9/01/04-8/31/09, Total funding \$400,000. (PI, Co-PIs Vijay Vittal, Zhendao Wang, G. Manimaran, and M. Salapaka). Additional REU support of \$6,000.
3. Rockwell Collins, "Enhancement of Microcode Development Tools)," 8/1/07-12/31/08, Total funding \$39,000.
4. Rockwell Collins, "3-D Localization and Optical sensor)," 8/1/07-12/31/08, Total funding \$49,000.
5. NSF, "Integrity Monitoring and Recovery Techniques for Next Generation Submicron Microprocessors," 8/01/03-10/31/08, Total funding \$240,200, (sole PI). Additional REU support of \$18,000.
6. NSF, "MRI: Acquisition of a 512-node BlueGene/L Supercomputer for Large-Scale Applications in Genomics and Systems Biology," 8/1/05-8/1/08, Total funding \$600,000 + match of \$300,000 and additional match of \$720,000 from ISU sources, (Co-PI with Drs. Aluru (lead PI). R. Jernigan, and P. Schnable).
7. NSF, "High Speed System Engineering," (Co-PI with Drs. M. Mina and R. Weber), 8/25/03-8/15/07, Total funding \$512,096. Additional REU support of \$12,000.
8. NSF, "NR: Collaborative Research: Wavelength Sharing Mesh-Restorable Optical Networks," (PI from ISU in collaboration with Dr. K. Sivalingham, 9/1/03-8/31/07, Total funding \$371,000, ISU Funding, \$197,000, First Two Year Funding \$131,471. (PI from ISU). Additional REU support of \$12,000.
9. NSF, "Routing, Wavelength Assignment, Dimensioning and Performance of Optical Networks with Multicast Service," (Co-PI with Dr. A. Kamal), 8/15/2001 - 8/15/2006, \$236,000. Additional REU support of \$12,000.

10. Lockheed Martin Company, "Developing an Innovative Software Engineering Education Program," (Co-PI with Dr. S. Kothari), 02/01/02-01/31/07, \$165,000.
11. ITN Corporation, "Subsystem Fault Detection in Sensor Networks," Subcontract from an NSF SBIR grant, (sole PI) , 07/01/05-07/12/05, \$14,000.
12. Lockheed Martin Company, "Optical Networking," \$50,000, 1/1/03-12/31/05. (sole PI)
13. NSF, " Exploring Architectures and Algorithms for Optical Networks (Collaborator Dr. S. Subramaniam of GWU)," 8/16/99 - 8/15/04, \$333,553 for ISU's work (total \$510,000).
14. DARPA (subcontract from GWU), "FAMOS: Fault and Attack Management in Optical Networks," 5/15/00 - 11/14/03, \$471,000 for ISU work. (Total including GWU funding is \$ 2.4 Million).
15. NSF, "Adaptive Balanced Computing Architectures (With Dr. A. Tyagi)," 8/16/99 - 8/15/03, \$350,000.
16. NSF, "REU Program," 8/16/99-8/15/03, \$60,000 (6 grants of \$10,000 each).
17. NSF, "Robust Resource Management in Real-Time Systems with Feedback," (Co-PI with Drs. G. Manimaran and M. Salapaka), 3/1/2001 - 2/28/03, \$110,000.
18. Nicholas Professorship, ISU, \$35,000/year + \$40,000/year from ECPE department, 1997-2202.
19. Lockheed Martin Company, "Real-Time Software for CAVE (common Avionics Vehicle Environment) Multiprocessor System," (Co-PIs Drs. S. Kothari and G. Manimaran), 02/01/00-01/31/01, \$50,000.
20. Craver Trust, "Reliability of Future Processors," 7/1/00 - 6/30/01, \$10,750.
21. NSF, "Extent and Effects of Error Propagation and Recovery Mechanisms in Cache Memory Systems (PI)," 9/16/96 - 8/15/00, \$180,000.
22. NSF, "Issues in Design of Lightwave Networks with Sparse Wavelength Conversion (Co-PI M. Azizoglu)," 9/16/96 - 8/15/00, \$338,395.
23. Innovative Medical Devices, "Music Artists' Assistant Design of a Music Display/Follow System," 6/1/99 - 5/31/00, \$113,000.
24. Craver Trust, "ABC:Adaptive Balanced Computing," 7/1/98-6/30/99, \$25,000 (Co-PI Dr. A. Tyagi).
25. Boeing, "Development of Markov Modeling Tools for Analysis of Fault Tolerant Systems (PI)," 1/1/91 - 12/31/98, \$475,000 (\$75,000 for 1997, \$50,000 for 1998).
26. Allied Signal, "Analysis Techniques for Integrated Avionics Systems (PI)," 6/16/97 - 9/15/98, \$95,000.
27. NSF, "Error Detection and Recovery in High Performance Fault Tolerant Processor Systems Employing Caches (PI)," 7/1/93 - 12/31/96, \$159,332.
28. Royalty Research Funds, UW, "Management of Remote Connectionless Multimedia Service through ATM Network (PI)," March 16, 1995 - June 15, 1996, \$20,700.
29. NSF, "Congestion Control and Fault Tolerance in Broadband-ISDN computing (PI with Professor James S. Meditch)," 8/16/91 - 7/15/95, \$461,620.
30. Boeing Advance Systems, "Cash gift," 1990 - 1994, \$10,000.
31. NASA Headquarters, "A study of Parallel Architectures and Algorithms for Volume Rendering," 7/1/91 - 6/30/93, \$44,000.
32. WTC, "Design of high integrity systems (PI)," 7/1/91 - 6/30/93, \$50,000.
33. Navy Coastal System Center, "Automatic classification hardware development," Investigators with G. Harkins, L. Shapiro, J. Hwang, T. Phillips, PI: Robert M. Haralick, 1/1/90 - 12/31/93, \$2,179,750.
34. Novell Inc., "Fault management in local area network (PI)," 2/1/91 - 9/15/91, \$20,365 (Cash), \$19,380 (Software and Hardware gifts).

35. WTC, "Design of high integrity systems (PI with Mani Soma), 7/1/88-6/30/91, \$135,400.
36. Intel Corp., "Processor pipeline architecture using i860 (PI)," 7/1/90 - 6/30/91, \$35,750 (H/W).
37. Boeing Aerospace Co., "Reliability analysis and modeling methodology (PI)," 3/16/88 - 9/30/90, \$80,320.
38. Boeing Electronics Co., "Methodology and design of an architecture for fault tolerant embedded systems (PI)," 11/1/86 - 9/30/89, \$113,642.
39. Boeing Aerospace Co., "Architectural Analysis of a fault tolerant architecture for embedded systems (PI)," 1/16/88 - 9/30/89, \$40,947.
40. Texas Instruments, "Microprogramming laboratory development (PI)," 9/1/88 - 6/30/89, \$18,478 (H/W).
41. Boeing Electronics Co., "Analysis and application of neural networks," Co-investigator with PIs: Robert Marks and Les Atlas, \$75,000 (1986), \$50,000 (1987).
42. University of Washington, "Equipment grants," \$10,000 (Graduate School), \$10,000 (College of Engineering), \$10,000 (Department of Electrical Engineering).
43. ASEE Career Advancement Opportunity Grant, "\$2,000 to attend Digital Signal Processing course (G. Tech) 1987," and "\$1,500 to attend VLSI System Design course (MIT), 1988."

7. Service Activities:

7.a. Professional societies and Editorship:

- Fellow IEEE, elected for "contributions to theory and applications of computer networks," 1999.
- Distinguished Engineer Award from ACM, 2006.
- Distinguished Speaker of IEEE Communication Society 2008-11.
- Distinguished Speaker of IEEE 2000-02.
- Distinguished Tutorial Speaker of IEEE 2000-02.
- Evaluator for ABET, 2003-Contd.
- Steering Committee, Optical Network Technical Group, SPIE
- Member (Fellow) IEEE Computer Society, 1986-Contd.
- Member (Fellow) IEEE Communication Society, 1995-Contd.
- Distinguished Engineer Member grade ACM, 1986-Contd..
- Member Beta Kappa Nu.
- Editor Electronic New Letter, IEEE TC on Fault Tolerant Computing, 1992-97.
- Editor of Special Issue of IEEE Computer Magazine on Fault Tolerance, April 1997.
- co-Editor of Special Issue of IEEE Network Magazine on Optical Networking, 2000.
- co-Editor of Special Issue of Optical Networks Magazine on Wavelength Conversion, 2000.
- co-Editor of Special Issue of MONET, 2000.
- Editor of Elsevier Microprocessor and Micro-systems Journal, January 1996 - December 2006.
- Associate Editor of IEEE Transactions on Computers, 1997-2002.
- Associate Editor of IEEE/ACM Transactions on Networking, 2003-2009.
- Associate Editor of Elsevier Computer Networks Journal, 2003-Contd.

- Associate Editor of Elsevier Optical Switching and Networking (OSN), 2004-Contd.
- Member Editorial Advisory Board, Journal of Pervasive Computing and Communications, 2005-Contd.

7.b. ISU University Committees:

- Member of Budget Model Review and Implementation Committee, 2006-2007.
- Member of Chair's cabinet, 2005-2011.
- Member of Chief Information Officer Search Committee, 2003.
- Member of Computer Science Chair Search Committee, 2001.
- Information Science and Technology Task Force, 2000.
- CAC 1999, 2000.

UW University Committees:

- Special Committee on Minority Faculty Affairs (1989-93), Chair (1992-93).
- Member of Royalty Research Fund Proposal Evaluation Committee (1993-95).

7.c. ISU College Committees:

- Engineering Fee Task Force (EFTF) Member 1998-2003.
- Served on Research Grant Committee Member 1998-2001.
- Chair of EFTF Allocation Review Committee 1998-1999.

UW College Committees:

- Served on ENGR Course Development Committee (1991-93).
- Student Affairs Committee (1993-94, 1995-1996).
- College Promotion and Tenure Committee (alternate member, 1996-99)

7.d. ISU Departmental Committees:

- Chair, ECpE, May 15-2003-Contd.
- Director of Information Infrastructure Institute, 2002-Contd.
- Associate Chair for resources 2000-2003.
- Chair of Promotion and Tenure Committee 2000-02.
- Chair of Computer Usage Committee 1998-2003.
- Member of Computer Usage Committee 1997-98.
- Member of Governance Document Revision Committee 1998-99.
- Member of Promotion and Tenure Committee 1998-03.
- Member of Faculty Search Committee 1997-99, 2002-2003.

UW Departmental Committees:

- Served on EE Support Services Committee (1985-87).
- Served on EE Admission Appeals Committee (1988-89).
- EE Faculty Search Committee (1988-89, 1990-91, 1993-94), Chair (1995-96).
- CSE Admissions Committee (1990-91, 1991-92).

- CSE Cheating Committee (1990-94, 1995-96).
- EE Graduate Study Committee (1990-91).
- EE Graduate Admissions Committee (1990-91).
- CSE Undergraduate Computer Architecture Course Committee (1990-91, 1991-92).
- EE Advisory Committee (1991-92, 1992-93).
- Group Chair, Electronics and Computers Group in EE (1991-92).
- EE Computer Resources Committee (1991-92, 1992-93, 1993-94, 1995-96).
- CSE Curriculum Committee (1992-93).
- CSE 519 seminar series (1993-94).
- CSE/EE Building Committee (1995-1996).
- EE Promotion and Tenure Review Committee (1995-97).
- Chair, CSE Graduate Student Review of Progress Committee (1995-96).
- CSE Qualifying Evaluation Committee (1996-97).
- Group Chair for EE Digital Systems (1996-97).

7.e. Outside University:

- Member of Board of Trustees, Hindu Temple and Cultural Center (HTCC), 1991-1997.
- Served as Treasurer (1990-92), Vice Chairperson (1992-93) and Chairperson of the Board of Trustees, HTCC, Seattle, 1993-95.
- Member of the Executive Committee of India Association of Western Washington (IAWW), 1993.
- Member of Board of Trustees, Hindu Temple and Cultural Center of Iowa (HTCC-CI) 1999-2011.
- Treasurer, HTCC-CI, 1999-2005.
- Vice President and Member of Executive Board of Indian Cultural Association, Ames, Iowa, 2006-2007.

8. Invited Lectures and Seminars:

- Panel Member, Reliability and Maintainability Symposium, January 1994, Los Angeles, CA.
- Panel Member, Reliability and Maintainability Symposium, January 1996, Los Angeles, CA.
- “WDM and Wavelength Conversion,” at Washington State University, July 1996.
- “Design decision in Proteus system,” at (i) University of California, Irvine, April 1993; (ii) Wollongong University, Wollongong, Australia, December 1993; (iii) University of Newcastle, Newcastle, Australia December 1993. (iv) University of Illinois, Urbana-Champaign, April 1994; (v) NASA Lewis Research Center, Cleveland, OHIO, July 1994; (vi) NASA Langley Research Center, Norfolk, VA, July 1994; (vii) Monash University, Melbourne, Australia, June 1995, (viii) Flinders University, Adelaide, Australia, June 1995; (ix) Australian National University, Canberra, Australia, June 1995; (x) University of N.S.W., Sydney, Australia, June 1995; (xi) Queensland University, Brisbane, Australia, June 1995; (xii) Old Dominion University, Norfolk, VA., October 1995; (xiii) Texas A & M, College Station, TX, May 1996; and (xiv) INPG, Grenoble, France, March 2001.
- “Using Spare Capacity for Fault Detection in Multiprocessor Systems,” at (i) University of Arizona, Tucson, AZ, April 1994; and (ii) IIT, New Delhi, Jan. 1995.

- “Performance for Nothing,” at (i) The University of Newcastle, Australia, March 1995; and (ii) The University of Tasmania, Hobart, Australia, June 1995.
- “RFDB: A Cache Protocol for Fault Tolerant Systems,” at IIT, New Delhi, Jan. 1995.
- “Issues in Design of High Performance Fault Tolerant Systems,” at IIT, New Delhi, India, Jan. 1995.
- “Recovery in Mobile Environments: Design and Trade-Off Analysis,” at FTCS-26, Sandai, Japan, June 25, 1996 (substitute Speaker).
- Organized a panel on hardware/software issue in high-performance computing at the second round table conference, ICASE, Hampton, VA, October 1996.
- “Role of Wavelength Conversion in all Optical Network,” at University of Washington, Dept. of Computer Science Lecture Series., January 1997.
- “Cache Fault Tolerance,” at Iowa State University, February 1997.
- “Role of Wavelength Conversion in all Optical Network,” at Iowa State University, Computer Science Lecture Series., October 1997, Massachusetts Institute of Technology, Cambridge, MA, October 1999, Texas A & M, College Station, TX, April 26, 2000.
- “Issues in Optical Interconnection of LANs,” at departmental seminar at Suny Buffalo, November 1997, departmental seminar at the George Washington University, November 1997, and departmental seminar at University of Iowa, Iowa City, December 1997, Aerospace Corporation, Los Angeles, February 1998, National Plasma Physics Institute, Ahmadabad, India, June 1999, Western Australian University, Perth July 1999.
- “Parallel Computing and Role of Overlapped Computing and Communication,” Iowa State University Energy Group Seminar, 1999.
- “Mobility: Optimal Location Management Algorithms and Fault Tolerance,” Ohio State University, April 1999, University of Cincinnati, OH, SUNY Buffalo, NY, November 1999.
- “Complex System Analysis and Introduction to HIMAP,” Lucent Inc, Naperville, IL, January 2000, Illinois Institute of Technology, January 2000.
- “Traffic Grooming in WDM Nets,” IP Over WDM Workshop, Paris, Nov. 2000.
- “Optical Network and Wavelength Division Multiplexing,” at National Plasma Physics Institute, Ahmadabad, India, January 2001, and Ohio State University, May 2001.
- “Role of Wavelength Conversion and Alternatives,” a 4-hour tutorial at (i) OPTICOMM-2000 conference, October 2000; (ii) IEEE Student Branch, Bombay Chapter, January 2001; (iii) Costa Rica University, San Jose, Costa Rica, March 2001; (iv) IEEE Student Branch, San Jose, Costa Rica, March 2001; (v) IEEE Student Branch, San Salvador, El Salvador, March 2001; (vi) IEEE Student Branch, Guatemala City, Guatemala, March 2001; and (vii) Broadband Fiber Optical Technology Conference, North Maharashtra University, Jalgaon, India, December 2001.
- “Beyond SONET and SDH,” Keynote Speech at Beyond SONET/SDH workshop, IP Over WDM Workshop Paris, April 2001.
- “Monitor Placement Algorithm,” High-Speed Networking Workshop, April 2001.
- “Beyond SONET and SDH,” Indian Institute of Bombay, December 7, 2001.
- “Survivable Traffic Grooming Networks,” Keynote Speech at Broadband Fiber Optical Technology Conference, North Maharashtra University, Jalgaon, India, December 2, 2001; Department of Electrical and Computer Engineering, University of Houston, March 15, 2002; Keynote Speech , IEEE Section Conference, San Jose, Costa Rica, May 29, 2002.
- “Advances in Optical Networks,” after dinner speaker at the Symposium Banquet the 21st Biennial Symposium, Kingston, Ontario, Canada, June 3, 2002.

- “Challenges in 2nd Generation Optical Network,” Key note Speeches at HSN 2002, New York, June 23, 2002, and SCI 2002, Orlando, FL, July 15, 2002.
- Panel Coordinator and Speaker, ”Traffic Grooming in Optical Networks: Challenges and Issues,” ONDM Conference, Budapest, Feb 4, 2003.
- “Advances in Optical Networks,” A four hour tutorial talk at ADCOMP-2003 held at PSG College of Technology, Coimbatore, India, December 17, 2003.
- “Grooming and Survivability Issues in Traffic Management in WDM Optical Networks,” Key note Speeches at ADCOMP-2003 held at PSG College of Technology, Coimbatore, India, December 18, 2003.
- “Survivability and Traffic Grooming,” Key note Speeches at ONDM-2005, February 7, 2005.
- “Architectural Issues in Optical Networking,” NSF-EU Workshop on Future of Optical Networking, Brussels, Belgium, June 27-28, 2005.
- “Achieving High Performance in Distributed Computing Grids,” Key note Speeches at PDCS 2005, November 14, 2005.
- “Survivability and Traffic Grooming in Optical Networking,” Distinguished Lecture, University of Texas, Dallas, January 27, 2006.
- Panel Member on panel discussing Future of Optical Networking at Broadnets 2006, San Jose, October 2006.
- “Protection of Power Grid and Use of Sensor Technology,” Departmental Seminar, ECE, University of North Carolina, Charlotte, NC, November 3, 2006.
- “A Premier on WDM Optical Networks,” Invited Talk at PHOTONICS 2006, Hyderabad, India, December 15, 2006.
- “Net Centric Computing: The Future of Computers & Networking,” 3rd Intl. Conf. on Distributed Computing and Internet Technology, Bhubaneswar, India, December 20, 2006.
- “Monitoring the US Power Grid Via Wireless Sensor Networks,” a presentation to the EPRI group at San Francisco, February 13, 2007.
- “Capacity Balanced Efficient Protection and Grooming Architecture for Optical Networks,” Keynote Speech at Broadnets 2007, Raleigh/Durham, NC, September 11, 2007.
- “Efficient Protection and Grooming Architecture for Optical Networks,” Invited Talk, Duke University, Raleigh/Durham, NC, September 2007.
- “Capacity Balanced Efficient Protection and Grooming,” at the 12 MC meeting of COST 293, Bartinoro, Italy, May 8, 2008.
- “Fault Tolerant Multicast-Couple Hop Routing over Light-Trails,” at the 2008 IEEE ANTS Conference, IIT/Mumbai, Dec 15, 2008.
- “An Efficient Superscheduler Architecture and Job Migration Algorithm for Computational Grids over Light-trail WDM Networks,” at Broadnets 2009, Madrid Spain, Sept. 2009.
- “Autonomous Aero-Visual and Sensor Based Inspection Network for Asset Monitoring,” at the 7th International Workshop on the Design of Reliable Communication Networks (DRCN 2009), Washington DC, October, 2009.
- A. K. Somani, “Efficient Protection and Grooming Architectures for Future Optical Networks,” tutorial talk at Asia Communication and Photonics Conference (APC) 2009, Shanghai, China, Nov 2009.

8.a. Organization Activities of International Conferences and Forums:

- General Chair, IEEE FTCS-27, held in Seattle WA, June 1997.

- General Chair, Broadnets 2005, held at Boston MA, October 2005.
- General Chair, IEEE EIT 2008, held at Ames, IA, May 2008.
- Technical Program Committee Chair, IEEE Workshop on Mixed Signal Testing, 1991.
- Program Chair, Advances in Computing (India) December 1997.
- Program Chair, IEEE ICCCN 1999.
- Program Chair, IEEE/SPIE OPTICOMM 2003.
- Tutorial Chair, IEEE ICC, 1995.
- Tutorial Chair, IEEE FTCS, 1999.
- Session Chair at several conferences.
- Track Chair: Networking at IEEE PCCC, Phoenix, AZ, March 1992, 1994.
- Program Committee Member: Fault tolerant computing symposium, 1991, 1994, 1996, 1997, 1998, 1999, Dependable Systems and Networks, 2003, 2004, Performance and Dependability Symposium, 2004-2009 (every year), Performance and Reliability 2002, Workshop on fault Tolerant Parallel and Distributed Computing, Amherst, 1992, 1994, EURO Parallel and Distributed Computing, 1998, Defect and Fault Tolerance in VLSI Systems, 1992, 1993, IEEE Phoenix Conference on Computers and Communications, 1992-2008 (every year), Heterogeneous Parallel and Distributed Computing, 1993, Asian Test Symposium, Tokyo, Japan, 1994, Reconfigurable Bus Architecture Workshop, 1994, 1995, 1996, Pacific Rim Fault Tolerant Computing Conference, 1995 - 2009, IEEE ICCCN, 1995, 1998 to 2009 (every year), IEEE INFOCOM, 1996, 1997, 1999, 2001, 2003, 2006-2010 (every year), IEEE ICC 2004-2009 (every Year), IEEE Globecom 2005-2009 (every year), SPIE Opticomm 2000, 2001, 2002, IPDS, 1996, 2003, 2004, HiPC, 1996, IPPS, 1998, Intl. Conf. On Comp. Sci. and Informatics (CS&I 2000), Australasian Computer Architecture Conference (ACAC-2000), HPSR 2004, 2005, IEEE HASE 2005, ONDM 2003, 2004, 2005, DRCN 2003, 2005, 2009, European Dependable Computing Conference, 2006, DISC 2007, Broadnets 2006-2009, IEEE LAN 2008, IEEE RNDM 2009.
- Panel Member
 - Reliability and Maintainability symposium, January 1994, Los Angeles, CA.
 - Hot Topics: Free Performance and Fault Tolerance, Sigmetrics, 1995.
 - Reliability and Maintainability symposium, January 1996, Las Vegas, NV.
 - NSF RIA for MIPS program, Research Equipment Program 1997, Networking Program 1997, ESS Program 1998, POWRE program 1998.

8.b. Referee:

- National Science Foundation, 1990-2009.
- Qatar National Research Fund (QNRF), Qatar Foundation, 2008, 2009.
- HongKong Research Foundation, 2008.
- ACM Computing Surveys, 1992.
- IEEE magazine “Computers,” “Computer Network,” “Software,”
- IEEE Transactions on Computers
- IEEE Transactions on Embedded Computer Systems
- IEEE Transactions on Dependable and Secure Computing
- IEEE/ACM transactions on Networking
- IEEE Transactions on Parallel and Distributed Computing

- IEEE Transactions on Circuits and Systems
- IEEE Transactions on Computer Aided Design
- IEEE Transactions on Reliability
- IEEE Transaction on Electronic Testing
- Elsevier Transactions on Computer Communication
- Elsevier Transactions on Computer Networks
- Elsevier Transactions on Microprocessors and Microsystems
- Journal of Parallel and Distributed Processing
- SPIE Journal of Lightwave Technology
- SPIE Journal of Networking
- Other journals, Theory and Applications, Progress in Neural Network, Algorithms, Computer Vision Graphics and Image Processing, Parallel Computing
- Various Conferences like Intl. Conf. on Parallel Processing, Symposium of Fault Tolerant Computing, International Parallel Processing Symposium, IEEE Phoenix Conference on Computers and Communications, International Symposium on Computer Architecture, International Conference on Computer Aided Design, Software Technology and Theoretical Computer Science, India, IEEE Symposium on Parallel and Distributed Computing, Sigmetrics, Hawaii International Conference, Defect and Fault Tolerance Workshop, High Performance Distributed Computing, International Conference on Parallel Computing, International Parallel Processing Symposium, High-Performance Computing, European Parallel and Distributed Computing, Optical Network Design and Modelling, Design of Reliable Communication Networks, High Performance Switching and Routing, European Dependable Computing Conference.

9. Publications:

Books and Book Chapters:

- A. K. Somani, "Protection approaches for survivable traffic grooming," a book chapter in Traffic Grooming for Optical Networks: Foundations and Techniques, coedited by R. Duta, A. Kamal, and G. Rouskas, published by Springer in 2008.
- A. K. Somani and Tao Wu, "Monitoring and Detecting Attacks in an All Optical Networks," a book chapter in Information Assurance: Survivability and Security in Networked Systems coedited by David Tipper, published by Morgan Kaufmann/Elsevier in 2007.
- A. K. Somani, "Network Design: Algorithms and Examples," In Wiley Encyclopedia of Electrical and Electronics Engineering (John Webster, ed.) Hoboken: John Wiley & Sons, Inc., March 2007.
- A. K. Somani, "Survivability and Traffic Grooming in Optical Networks," **Cambridge Press Book**, 436 pages, 2006.
- A. K. Somani, "System Level Diagnosis and Implications in Current Context," a book chapter on Dependable Computing Systems: Paradigms, Performance Issues, and Applications, Edited by Hassan B. Diab and Albert Y. Zomaya, published by Wiley Series on Parallel and Distributed Computing, 2005 (37 pages).
- A. K. Somani, "Tradeoffs and comparison of restoration strategies in WDM networks," a book chapter in Emerging Optical Network Technologies, by Krishna Sivalingam and Suresh Subramaniam, 2005, pp. 333-355 (21 pages).
- L. Li and A. K. Somani, "Multifiber WDM Networks," a book chapter in book edited by Lu Ruan and Ding-Zhu Du, published by Springer, 2001, pp. 123-150 (28 pages).
- L. Li and A. K. Somani, "Dynamic Wavelength Routing Techniques And Their Performance Analysis," book chapter in book edited by K. M. Sivalingam and S. Subramaniam, Kluwer Academic Publishers, 2000, pp. 247-272 (26 pages).
- A. K. Somani, "Network Design," invited paper in Wiley Encyclopedia of Electrical and Electronics Engineering, 1998, pp. 132-153 (22 pages).
- S. B. Choi and A. K. Somani, "A Parallel Algorithm for Embedding Complete Binary Trees in Faulty Hypercubes," Fault Tolerant Parallel and Distributed Computing, edited by D. Avresky and D. R. Kaeli, Kluwer Academic Publishers, 1998, pp. 249-265 (17 pages).
- P. Rostykus and A. K. Somani, "Biological Basis for Compact Neural Networks," in Vol 2, Progress in Neural Networks, Ablex Publishing Company, Norwood, New Jersey, Editor Prof. O. Omidvar, 1993, pp. 109-128 (20 pages).
- A. K. Somani and O. Peleg, "New Approaches in System-Level Diagnosis," Frontiers of Computing Systems Research, Essays on Emerging Technologies, Architectures and Theories, Volume 2, Plenum Publishing Corp, New York, NY USA, 1991, pp. 251-305 (55 pages).
- A. K. Somani and P. Rostykus, "Hypercube-based Compact Neural Networks and Their Comparison with Other Artificial Neural Networks," in Vol. 1, Progress in Neural Networks, Ablex Publishing Company, Norwood, New Jersey, Editor Prof. O. Omidvar, 1991, pp. 57-85 (pages 29 pages).
- A. K. Somani and P. Narong, "Reduced Interconnection Neural Networks," was accepted for publication as a book chapter (edited by Dr. Bruce Shriver). The book was to be published by Computer Society Press but had been since withdrawn by the editor as it could not be published in a timely manner, October 1989.

Archival Journal Articles including corresponding conference papers:

1. A. Gumaste, T. Das, A. K. Somani, and N. Ghani, "An Autonomic Two-Stage Auction Algorithm for Light-trail WDM Network Design," under review in the Journal of Networking, 2009.

2. K. Celik, S.-J. Chung, M. Clausman, and A. K. Somani, "Monocular Vision SLAM for Indoor Aerial Vehicles," submission no. 09-0303 under review for the IEEE Transactions on Robotics (IT-RO).
3. V. Subramanian, P. K. Ramesh, and A. K. Somani, "Managing the Impact of On-chip Temperature on the Lifetime Reliability of Reliably Overclocked Systems," International Journal on Advances in Systems and Measurements, IARIA.
4. S. Balasubramanian and A. K. Somani, "Path Level Traffic Grooming in WDM Metro Optical Networks," in IEEE Communication Magazine, Vol. 46, No. 11, November 2008, pp. 91-97.
5. S. Balasubramanian and A. K. Somani, "Dynamic Survivable Network Design for Path Level Traffic Grooming in WDM Optical Networks," in Journal of Networking, Vol. 7, Issue 8, August 2008, pp. 759-782.
6. P. Datta and A. K. Somani, "Graph Transformation Approaches for Diverse Routing in Shared Risk Resource Group (SRRG) Failures," in Elsevier Computer networks Journal, Vol. 52, Issue 12, August 2008, pp. 2381-2394.
7. M. Mahesh, J. Fang, K. M. Sivalingam, and A. K. Somani, "Design and Analysis of Partial Protection Mechanisms in Groomed Optical WDM Mesh Networks," Journal of Optical Networking, Vol. 7, Issue 6, July 2008, pp. 617-634.
8. S. Ramasubramanian and A. K. Somani, "MICRON: A framework for connection establishment in optical networks," in IEEE/ACM Transactions on Networking, vol. 16, no. 2, April 2008, pp. 473-485.
9. T. S. Ganesh, M. T. Frederick, T. S. B. Sudarshan, and A. K. Somani, "HashChip: A Shared-Resource Multi-Hash Function Processor Architecture on FPGA," in Special Issue of the Elsevier Integration of VLSI Journal, Volume 40, Issue 1, January 2007, Pages 11-19.
10. R. Sangireddy and A. K. Somani, "On-Chip Adaptive Circuits for Fast Media Processing," in IEEE Transactions in Circuits and Systems, II, Vol. 53, No. 9, September 2006, pp. 946-950.
11. A. M. Hamad, T. Wu, A. E. Kamal and A. K. Somani, Multicasting Protocols For Wavelength-Routing Networks, Elsevier Computer Networks, Volume 50, Issue 16, 14 November 2006, Pages 31053164.
12. R. Gupta, V. Sekhri, and A. K. Somani, "CompuP2P: An Architecture for Internet Computing Using Peer-to-Peer Networks," in IEEE Transactions on Parallel and Distributed Systems, Vol. 17, No. 11, Nov 2006, pp. 1306-1320. This paper is based on earlier work presented as "CompuP2P: A Light-Weight Architecture for Internet Computing" in Proc. of Second International Conference on Broadband Networks (IEEE Broadnets), Boston, MA, USA, October 2005, pp. 931-940.
13. T. Wu and A. K. Somani, "Attack Monitoring and Localization in All-Optical Networks", in Cluster Computing: The journal of Networks, Software Tools and Applications, Vol. 9, No. 4, pp. 465-473, October 2006. This paper is based on earlier work presented as "Attack Monitoring and Localization in All-Optical Networks," in Proceedings of OptiComm 2002, July 2002, pages: 235-248. **Won the Best Paper AWARD.**
14. R. Gupta, S. Ray, A. K. Somani, Z. Zhang, "Utilizing Node's Selfishness for Providing Complete Anonymity in Peer-to-Peer Based Grids," in Multiagent and Grid Systems – An International Journal, Volume 2, No. 1 / 2006, Pages: 11 - 27, Januray 2006.
15. M. T. Frederick, P. Datta and A. K. Somani, "Sub-Graph Routing: A generalized fault-tolerant strategy for link failures in WDM Optical Networks," in Computer Networks 50 (2006), pp. 181-199. This paper is based on earlier work presented as P. Datta, M. T. Frederick and A. K. Somani, "Sub-Graph Routing: A Novel Fault-Tolerant Architecture for Shared-Risk Link Group failures in WDM Optical Networks," in 4th International Workshop on the Design of Reliable Communication Networks (DRCN 2003), Banff, Alberta, Canada, October 2003, pp. 296-303.
16. N. VanderHorn, S. Balasubramanian, M. Mina, A. K. Somani, "Light-Trail Test Bed for IP-Centric Applications," IEEE Communications Magazine-Special issue on Optical Networking Testbeds: Experiences, Challenges and Future Directions, August 2005, pp. 11-16.

17. R. Sangireddy, N. Futamura, Srinivas Aluru, and Arun K. Somani, "Scalable, Memory Efficient, High-Speed Algorithms for IP Lookups," in *IEEE/ACM Transactions on Networking*, Vol.13, Issue 4, August 2005, pp. 802-812. This paper is based on an earlier work presented as N. Futamura, R. Sangireddy, S. Aluru, and A. K. Somani, "Scalable, memory efficient, high-speed lookup and update algorithms for IP routing," in *Proc. of IEEE Computer Communications and Networks (ICCCN)* October 2003, pp. 257-263.
18. Tao Wu and A. K. Somani, "Cross-Talk Attack Monitoring and Localization in All-Optical Networks," in *IEEE/ACM Transactions on Networking*, December 2005, pp. 1390-1401. This paper is based on earlier work presented as "Necessary and Sufficient Condition for Crosstalk Attack Localization in All-Optical Networks," in *Proceedings of APOC002*, October 2002; and "Necessary and Sufficient condition for k crosstalk attacks localization in all-Optical Networks," *Proceeding of IEEE Globecom* 2003, Dec. 1-5, 2003, paper OP02-5.
19. R. A. Omari, A. K. Somani, and G. Manimaran, "An adaptive scheme for fault-tolerant scheduling of soft real-time tasks in multiprocessor systems," *Journal of Parallel and Distributed Computing*, Vol. 65, no. 5, pp. 595-608, May 2005. This paper is based on earlier work presented as "An Adaptive Scheme for Fault-Tolerant Scheduling of Soft Real-time Tasks in Multiprocessor Systems," in *Proceedings of the International Conference on High Performance Computing*, December 2001, pp.68-80.
20. W. He, M. Sridharan and A. K. Somani, "Capacity optimization for tolerating double link failures in WDM mesh optical networks," *Journal of Photonic Network Communication*, Vol. 9:1, January 2005, pp. 99-111. This paper is based on earlier work presented as "Capacity Optimization for Surviving Double-Link Failures in Mesh-Restorable Optical Networks," in *Proc. of OptiComm 2002*, July 2002, pp. 13-24.
21. A. K. Somani, M. Mina, and L. Li, "On Trading Wavelengths with Fibers: A Cost-Performance Based Study," in *IEEE/ACM Transactions on Networking*, Vol. 12, Issue. 5, October 2004, pp. 944 - 951. This paper is based on earlier work presented as A. K. Somani and M. Mina, "On trading wavelengths with Fibers: A cost-performance based study," in *38th Annual Allerton Conference on Communication, Control, and Computing*, October 2000, pp. 1274-1283.
22. R. Sangireddy, H. Kim and A. K. Somani, "Low Power High Performance Reconfigurable Computing Cache Architectures", *IEEE Transactions on Computers*, Vol. 53, No.10, October 2004, pp. 1274-1290. This paper is based on earlier work presented as "Low-Power High-Performance Adaptive Computing Architectures for Multimedia Processing", in *Proceedings of HiPC2002, The Ninth Annual International Conference on High Performance Computing*, December 2002, pp. 124-134.
23. S. Ramasubramanian and A. K. Somani, "Analysis of optical networks with heterogeneous grooming architectures," in *IEEE/ACM Transactions on Networking*, vol. 12, no. 5, October 2004, pp. 931-943.
24. R. Al-Omari, A. K. Somani, and G. Manimaran, "Efficient overloading techniques for primary-backup scheduling in real-time systems", in *Journal of Parallel and Distributed Computing*, Vol. 64, Issue 5, May 2004, pp. 629-648. This paper is based on earlier work presented as "An Efficient Backup-Overloading for Fault-Tolerant Scheduling of Real-Time Tasks," *Annual IEEE Workshop on Fault-Tolerant Parallel and Distributed Systems, FTPDS-2000* May 2000, pp. 1291-1295.
25. R. Sangireddy and A. K. Somani, "High-Speed IP Routing with Binary Decision Diagrams Based Hardware Address Lookup Engine", in *IEEE Journal on Selected Areas in Communications*, *IEEE J-SAC*, June 2003, pp. 513-521. This paper is based on earlier work presented as "Binary Decision Diagrams for Efficient Hardware Implementation of Fast IP Routing Lookups", *Proceedings of ICCCN2001, Tenth IEEE International Conference on Computer Communications and Networks*, October 2001, pp. 12-17.
26. Sonal Pandey, A. K. Somani, and A. Tyagi, "Intermediate processing protocol for processing within IP-routed networks," special issue of *Microprocessor and Microcontrollers Journal*, Volume 27, Issue 5-6. June 2003, pp. 285-295. This paper is based on earlier work presented as "A Reliable Protocol for Processing within IP-Routed Networks," in *Proc. of IEEE ICCCN 2002*, October 2002, pp. 84-89.

27. S. Thiagarajan and A. K. Somani, "Optimal Wavelength Converter Placement in Arbitrary Topology Wavelength-Routed Networks," in *Computer Communications*, published by Elsevier, Vol. 26, Issue 9, June 2003, pp. 975-985. This paper is based on earlier work presented as "An Efficient Algorithm for Optimal Wavelength Converter Placement on Wavelength-Routed Networks with Arbitrary Topologies," in the *Proc. of INFOCOM 1999*, May 1999, pp. 916-923.
28. J. Fang, R. Srinivasan and A. K. Somani, "Performance Analysis of WDM Optical Networks with Wavelength Usage Constraint," in *Journal of Photonic Network Communications*, 5(2), March 2003, pp. 137-146. This paper is based on earlier work presented as "Performance analysis of WDM optical networks with wavelength usage constraint" in *Proceedings of the Sixth Working Conference on Optical Networks Design and Modelling*, February, 2002.
29. R. Srinivasan and A. K. Somani, "Dynamic Routing in WDM Grooming Networks," in *Journal of Photonic Network Communications*, 5(2), March 2003, pp. 123-135. This paper is based on earlier work presented as Arun K. Somani, "Dynamic Routing in Survivable WDM Grooming Networks", in *Proceedings of 40th Annual Allerton Conference on Communication, Control, and Computing*, October 2002.
30. R. Srinivasan and A. K. Somani, "On achieving fairness and efficiency in high-speed shared medium networks," in *IEEE/ACM Transactions on Networking*, Vol. 11, No. 1, February 2003, pp. 111-124.
31. M. Sridharan and A.K. Somani, "Design for Upgradability in Mesh-Restorable Optical Networks," in *Special Issue on Protection/Restoration Meets the Reliability Challenge for the Optical Internet*, *Optical Networks Magazine*, May/June 2002, pp. 77-87.
32. S. Thiagarajan and A.K. Somani, "Traffic Grooming for Survivable WDM Mesh Networks," in *Special Issue on Protection/Restoration Meets the Reliability Challenge for the Optical Internet*, *Optical Networks Magazine*, May/June 2002, pp.88-98. This paper is based on earlier work presented as "Traffic grooming for survivable WDM mesh networks," in *Proceedings of OPTICOMM 2001*, August 2001.
33. R. Srinivasan and A. K. Somani, "A Generalized Framework for Analyzing Time-Space Switched Optical Networks," in the *Journal of Selected Areas in Communications: Special Issue on WDM-based Network Architectures*, January 2002, Vol. 20, No. 1, pp. 202-215. This paper is based on earlier work presented as "A Generalized Framework for Analyzing Time-Space Switched Optical Networks," in *Proc. of INFOCOM 2001*, pp. 179-188, April 2001.
34. M. Sridharan, M. V. Salapaka, A. K. Somani, "A Practical Approach to Operating Survivable WDM Networks," in the *Journal of Selected Areas in Communications: Special Issue on WDM-based Network Architectures*, January 2002, Vol. 20, No. 1, pp. 34-46.
35. S. Kim and A. K. Somani, "On-Line Integrity Monitoring of Microprocessor Control Logic," in the *Microelectronics Journal*, 2001. This paper is based on earlier work presented as "On-Line Integrity Monitoring of Microprocessor Control Logic," in *International Conference on Computer Design (ICCD): VLSI in Computers and Processors*, Austin, Texas, September, 2001, pp. 314 -319.
36. G. Mohan, A. K. Somani, and Sivaram Murthi "Efficient Algorithms For Routing Dependable Connections in WDM Optical Networks," in *IEEE/ACM Transactions On Networking*, Vol. 9, Issue 5, October 2001, pp.553 -566. This paper is based on earlier work presented as G. Mohan and A. K. Somani, "Routing Dependable Connection with Specified Failure Restoration Guarantees in WDM Networks," in the *Proceedings of INFOCOM 2000*, April 2000, pp. 1761 -1770.
37. L. Li and A. K. Somani, "Blocking Performance Analysis of Fixed-Paths Least-Congestion Routing in Multifiber WDM Networks," in *International Journal of Communication Systems*, 2001. This paper is based on earlier work presented as "Blocking Performance Analysis of Fixed-Paths Least-Congestion Routing in Multifiber WDM Networks," in *Proc. SPIE Photonics East'99*, Boston, MA, September 1999, pp.56-67.
38. L. Li and A. K. Somani, "Efficient Algorithms for Wavelength Converter Placement in All-Optical Networks," in *Optical Networking Magazine*, 2001. This paper is based on earlier work presented as "Efficient Algorithms for the Wavelength Converter Placement on All-Optical Networks," in *Proc. Conference on Information Sciences and Systems*, Maryland, March 1999.

39. H. Kim, A. K. Somani, and A. Tyagi, "A Reconfigurable Multi-function Computing Cache Architecture," in the IEEE Transactions on Very Large Scale Integration Systems, Vol. 9, No. 4, August 2001, pp. 509-523. This paper is based on earlier work presented as "A Reconfigurable Multi-function Computing Cache Architecture," in the Proceedings of FPGA 2000, February 2000, pp. 85-94.
40. M. Sridharan, A. K. Somani, and M. Salapaka, "Approaches for Capacity And Revenue Optimization in Survivable WDM Network," in Special issue on Survival Network, Journal of High Speed Network, vol. 10, no. 2, August 2001, pp. 109-125. This paper is based on earlier work presented as M. Sridharan, M. V. Salapaka, and A. K. Somani, "Operating mesh-survivable WDM transport networks," SPIE Technical Conference on Terabit Optical Networking: Architecture, Control, and Management Issues, Boston, November 2000, pp. 113-123. and M. Sridharan and A. K. Somani, "Revenue Maximization in Survivable WDM Networks," in Proc. of OPTICOMM 2000, October 2000, pp. 291-302.
41. A. K. Somani, "Issues in Design and Deployment of Ad-Hoc Networks," Guest Editorial, special issue of in *Mobile Applications and Networking (MONET) journal*, May 2001.
42. G. Krishnamurthi, M. Azizoğlu, A. K. Somani, "Optimal Distributed Location Management in Mobile Networks," in *Mobile Applications and Networking (MONET) journal*, 2001. This paper is based on earlier work presented as "Optimal Location Management Algorithms for Mobile Networks," in Proceedings of the Fourth Annual ACM/IEEE International Conference on Mobile Computing and Networking, pp. 223-232, Dallas, October 1998.
43. S.Thiagarajan and A. K. Somani, "Capacity Fairness of WDM Networks with Grooming Capabilities," in the Optical Network Magazine, Kluwer Academic Publishers, May/June 2001, pp. 24-32. This paper is based on earlier work presented as "Capacity Fairness of WDM Networks with Grooming Capabilities," OPTICOMM 2000, Dallas, SPIE Proc. Vol. 4233, October 2000, pp. 191-201.
44. A. K. Somani and M. Azizoğlu, "Wavelength Assignment Issues in Wavelength-Routed Networks," IEEE/OSA Journal of Lightwave Technologies 2001, Vol. 18, No. 12, December 2000, pp. 1807-1817. This paper is based on earlier work presented as "All Optical LAN Interconnection with a Wavelength Selective Router," in Proc. IEEE INFOCOM'97, pp. 1278-1285, April 1997.
45. A. K. Somani and B. Ramamurthy, "Optical Communication Networks for the Next-Generation Internet," Guest Editorial, IEEE Network Magazine, Nov./Dec. 2000, Vol. 14, No. 6, pp. 6-7.
46. L. Li and A. Somani, "A New Analytical Model for Multifiber WDM Networks," in IEEE Journal of Selected Areas in Communications, Vol. 18, Issue 10, Oct. 2000, pp. 2138-2145. This paper is based on earlier work presented as "A New Analytical Model for Multifiber WDM Networks," in Proc. Globecom'99, Rio de Janeiro, Brazil, December 1999, pp. 1007-1011.
47. A. K. Somani and A. Sansano, "Achieving Robustness and Minimizing Overhead in Parallel Algorithms Through Overlapped Communication/Computation," The Journal of Supercomputing, Vol. 16, no. 1-2, pp. 27-52, May 2000.
48. G. Krishnamurthi, S. Chessa, A. K. Somani, "Fast Recovery from Database/Link Failures in Mobile Networks," *Journal of Computer Communications*, Vol. 23(2000), no 5-6, pp. 561-574, March 2000. This paper is based on earlier work presented as "Fast Recovery Protocol for Database and Link Failures in Mobile Networks," in Proc. of the Seventh Annual International Conference on Computer Communications and Networking, pp. 32-39, October 12-15 1998, Lafayette.
49. S. Subramaniam, M. Azizoğlu, and A. K. Somani, "On Optimal Converter Placement in Wavelength-Routed Networks," IEEE/ACM Journal of Networking, Volume 7, No. 5, October 1999, pp. 754-766. This paper is based on earlier work presented as "Converter placement on wavelength-routed network paths," in All-Optical Communication Systems: Architecture, Control, and Network Issues III, John M. Senior, Robert A. Cryan, Chunming Qiao, Editors, in Proceedings of SPIE Vol. 3230, pages 265-276, Nov. 1997. Won the **best paper award**.
50. L. Li and A. K. Somani, "Dynamic Wavelength Routing Using Congestion and Neighborhood Information," IEEE/ACM Trans. On Networking, Volume 7, No. 5, October 1999, pp. 779-786.
51. C. Chen and A. K. Somani, "Fault Containment in Cache Memories for TMR Redundant Processor Systems," in IEEE Transactions on Computers, Vol. 48, No. 4, March 1999, PP. 386-397.

52. S. Kim and A. K. Somani, "An Adaptive Write Error Detection Technique in On-Chip Caches of Multi-Level Caching Systems," *Microprocessors and Microsystems Journal*, Vol. 22, No. 9, March 1999.
53. S. Subramaniam, A. K. Somani, M. Azizoglu, and R. A. Barry, "The Benefits of Wavelength Conversion in WDM Networks with Non-Poisson Traffic," in *IEEE Communications Letters*, 1998, Vol. 3, No. 3, March 1999, pp. 81-83. This paper is based on earlier work presented as S. Subramaniam, A. K. Somani, M. Azizoglu, and R. A. Barry, "A performance model for wavelength conversion with non-Poisson traffic," in *Proc. IEEE INFOCOM'97*, pp. 499-506, April 1997.
54. A. V. Ramesh, D. W. Twigg, U. R. Sandadi, T. C. Sharma, K. S. Trivedi, and A. K. Somani, "An Integrated Reliability Modeling Environment," in *Reliability Engineering and System Safety*, Elsevier Science Limited; UK, Volume 65, Issue 1, March 1999, pp. 65 - 75.
55. A. K. Somani, S. Palnitkar, and T. Sharma, "Reliability Modeling of Scheduled Maintenance Systems with Latent Failures," in *Intl. Journal of Reliability, Quality, and Safety Engineering*, Vol. 5, No. 4, 1998. This paper is based on earlier work presented as "Reliability Modeling of Systems with Latent Failures Using Markov Chains," in the *Proc. of RAMS-1993*, at Atlanta, GA, pp 120-125.
56. K. Mahesh, G. Manimaran, C. S. R. Murthy, and A. K. Somani, "Scheduling Algorithms Exploiting Spare Capacity and Tasks' Laxities for Fault Detection and Location in Real-Time Multiprocessor Systems," in *JPDC*, Vol 51, June 1998, pp. 136-150. This paper is based on earlier work presented as "Scheduling Algorithms Exploiting Spare Capacity and Tasks' Laxities for Fault Detection and Location in Real-time Multiprocessor Systems," in the *Proc. of IPPS*, Orlando, pp.737-741, March 1998.
57. A. K. Somani and T. Zhang, "DIRSMIN, A Fault Tolerant Switch for B-ISDN Applications Using Dilated Reduced-Stage MIN," in *IEEE Transactions on Reliability*, Volume 47, No. 1, pp. 19-30, March 1998. This paper is based on earlier work presented as "Architecture and Performance Analysis of DIRSMIN: A Fault-Tolerant Switch Using Dilated Reduced-Stage MIN," *ICASE Technical Report No. 95-78*, November, 1995.
58. Ki-Sang Song and A. K. Somani, "Modeling and Design of Dependable High Speed Information Networks," in the *IASTED International Journal of Modelling and Simulation Journal*, Volume 18, No. 3, 1998, pp. 214-223.
59. C. M. Wittenbrink and A. K. Somani, "Time and Space Optimal Data Parallel Volume Rendering Using Permutation Warping," in *Journal of Parallel and Distributed Computing*, Volume 46, Number 2, November 1, 1997, pp. 148-164. This paper is based on earlier work presented as "Permutation Warping for Data Parallel Volume Rendering," in *Parallel Rendering Symposium, Visualization '93*, San Jose, California, 1993, pages 57-60, color plate page 110.
60. S. Subramaniam, M. Azizoglu, and A. K. Somani, "Connectivity and sparse wavelength conversion in wavelength-routing networks," in *IEEE/ACM Journal of Networking*, Vol. 4, No. 4, August 1997, pp. 544-557. This paper is based on earlier work presented as "Connectivity and sparse wavelength conversion in wavelength-routing networks," in *Proc. of IEEE INFOCOM'96*, San Francisco, 1996, pp. 148-155.
61. A. K. Somani and N. H. Vaidya, "Understanding Fault Tolerance and Reliability," *IEEE Computer*, Vol. 30, No. 4, April 1997, pp. 45-50.
62. A. K. Somani, "Simplified Phased-Mission Systems Analysis for Systems with Independent Component Repairs," in *Intl. Journal of Reliability, Quality, and Safety Engineering*, Vol. 4, No. 2, 1997, pp. 167-189. This paper is based on earlier work presented as "Simplified Phased-Mission System Analysis for Systems with Independent Component Repairs," *NASA CR-198318, ICASE Report No. 96-23*, March 1996.
63. V. Lee, N. Lam, F. Xiao, and A. K. Somani, "Superscalar and Superpipelined Microprocessor Design and Simulation: A Senior Project," in *IEEE Transactions on Education*, Vol. 40, No. 1, February 1997, pp. 89-97.

64. C. Chen and A. K. Somani, "Architectural Techniques Tradeoff Using Mean Memory Delay Time," in *IEEE Transactions on Computers*, Vol. 45, No. 10, October 1996, PP. 1089-1100. This paper is based on earlier work presented as "A Unified Architectural Tradeoff Methodology," in the *Proc. of ISCA 94*, Chicago, April 1994, pp. 348-357.
65. A. K. Somani and O. Peleg, "On Diagnosability of Large fault Sets and Its Applications to Regular-Interconnected Computer Systems," in *IEEE Transactions on Computers*, Vol. 45, No. 8, August 1996, pp 892-903.
66. S. Subramaniam and A. K. Somani, "Multicasting in ATM networks using MINs," in *Computer Communications*, vol. 19, No. 8, August 1996, pp. 712-722. This paper is based on earlier work presented as "Multicasting in ATM networks using MINs," in the *Proc. of ICCCN, 1995*, Las Vegas, NV, 1995, pp. 142-149, Sept. 1995.
67. S. Subramaniam, M. Azizoglu, and A. K. Somani, "All-optical networks with sparse-wavelength conversion," in *IEEE Transactions on Networking*, Volume 4, Issue 4, August 1996, pp. 544-557.
68. Craig M. Wittenbrink, A. K. Somani, and C.-H. Chen, "Cache Write Generate for Parallel Image Processing on Shared Memory Architectures," in *IEEE Transactions on Image Processing*, Vol. 5, No. 7, July 1996, pp. 1204-1208.
69. S. B. Choi and A. K. Somani, "Design and Performance Analysis of Load-distributing Fault-tolerant Network," in *IEEE Transactions on Computers*, Vol. 45, No. 5, May 1996, pp. 540-551.
70. S. Tridandapani, A. K. Somani, and U. Reddy, "Low Overhead Multiprocessor Allocation Strategies Exploiting System Spare Capacity for Fault Detection and Location," in *IEEE Transactions on Computers*, Vol. 44, No. 7, July 1995, pp. 865-877. This paper is based on earlier work presented as "Efficient Utilization of Spare Capacity For Fault Detection and Location in Multiprocessor Systems," in the *Proc. of FTCS-92*, July 1992 at Boston, MA, pp. 440-447.
71. C. Wittenbrink and A. K. Somani, "2D and 3D Optimal Parallel Image Warping," *Journal of Parallel and Distributed Computing*, Vol. 25, No. 2, pages 197-208, March 1995. This paper is based on earlier work presented as "2D and 3D optimal parallel image warping," in the *Proc. of Seventh International Parallel Processing Symposium*, Newport Beach, CA, April 13-16, 1993, pp. 331-336.
72. R. M. Haralick, A. K. Somani, C. Wittenbrink, R. Johnson, K. Cooper, L. G. Shapiro, I. T. Phillips, J. N. Hwang, W. Cheung, Y. H. Yao, C.-H. Chen, L. Yang, B. Daugherty, B. Lorbeski, K. Loving, T. Miller, L. Parkins, and S. Soos, "Proteus: A Reconfigurable Computational Network for Computer Vision," *Machine Vision and Applications*, 1995, Vol. 8 (no. 2), pp. 85-100, February 1995. This paper is based on earlier work presented as "Proteus: A Reconfigurable Computational Network for Computer Vision," *International Conference on Pattern Recognition 1992, Computer Vision and Pattern Recognition 1992*, March 1992, pp. 43-54 (**Judged among the 6 best papers**). This work was also presented in the *Proc. of the SPIE, The Intl. Society for Optical Engineering*, Vol. 1659, pp. 54-76, 1992.
73. A. K. Somani and S. Thatte, "The Helical Cube Network," *NETWORKS, An International Journal*, Vol. 26 (1995), pp. 87-100.
74. M. Harrington and A. K. Somani, "Synchronizing Hypercube Networks in the Presence of Faults," *IEEE Transactions on Computers*, Oct. 1994, pp. 1175-1183. This paper is based on earlier work presented as "On Synchronization of Hypercube in the Presence of Faults," in the *Proc. of workshop on fault tolerance in parallel and distributed systems*, July 1992 at Amherst, MA, pp. 225-232.
75. H. Amindavar, J. Ritcey, and A. K. Somani, "Analytical Computation of Markov Chain Using Padé Approximation," in the *Journal of Computers and Operations Research*, Vol. 21, No. 6, pp. 661-675, 1994.
76. A. K. Somani and K. S. Trivedi, "Phased-Mission System Analysis Using Boolean Algebraic Methods," in *Performance Evaluation Review*, vol. 22, no. 1., May 1994, pp. 98-107.
77. C. Tarng, J. A. Meditch, and A. K. Somani, "A Novel Approach to increase the Flexibility of the Telecommunications Networks Using Unidirectional Switched Virtual Path or Faucet Bandwidth," in *Annual Reviews of Communications, International Engineering Consortium*, Volume XLVIII, 1994, pp. 609-619.

78. A. K. Somani, "Reliability Estimates of Fault Tolerant Systems in User Application Environment," SAE Communications in Reliability, Maintainability, and Supportability, An International Journal, Vol. 1, no. 1, 1994, pp. 3-13. This paper is based on earlier work presented as "Reliability Modeling of Complex Fault Tolerant System with Latent Failures using Phased-Mission System Approach," in the Proc. of IERC, May 26-27, 1993, Los Angeles, CA, pp. 574-578.
79. C. Wittenbrink and A. K. Somani, "Cache Tiling for High-Performance Morphological Image Processing," in Machine Vision and Applications, special issue on vision processing architectures, Nov. 1993, pp. 12-22. This paper is based on earlier work presented as "Cache Tiling for High-Performance Morphological Image Processing," in the Proc. of Computer architecture for Vision Processing, France in December 1991, pp. 427-438 (**Judged among the 6 best papers**).
80. S. B. Choi and A. K. Somani, "Rearrangeable Circuit-Switched Hypercube Architecture for Routing Permutations," JPDC, Vol. 19, 1993, pp. 125-133. This paper is based on earlier work presented as "On Embedding Permutations in Hypercubes," in the Proc. of DMCC6, May 1991, pp. 622-629.
81. A. K. Somani, J. Ritcey, and S. Au, "Phased-Mission Reliability Analysis," in IEEE Transactions on Reliability, December 1992, pp. 504-511. This paper is based on earlier work presented as "Phased Mission Reliability Analysis," abstract and poster presentation in the Proc. of SIGMetrics-90, May 1990.
82. A. K. Somani and V. K. Agarwal, "Distributed Diagnosis Algorithms for Regular Interconnected Structures," IEEE transactions on Computers, Vol. 41, No. 7, July 1992, pp. 899-906. This paper is based on earlier work presented as "Distributed Syndrome-Decoding for Regular Interconnected Structures," in the Proc. of FTCS-19, Chicago, June 1989, pp. 70-77.
83. S. B. Choi and A. K. Somani, "The Generalized Folding-Cube Network," NETWORKS, An International Journal, Vol. 21, March 1991, pp. 267-294. This paper is based on earlier work presented as "The Generalized Hyper-Cube," in the Proc. of ICPP-90, August 1990, pp. I/372-I/375.
84. A. K. Somani, "Sequential Fault Occurrence and Reconfiguration in System-Level Diagnosis," IEEE Transactions on Computers, Vol 39, No. 12, Dec. 1990, pp. 1472-1475. This paper is based on earlier work presented as "On Characterization of Systems with Sequential Fault Occurrence and Reconfiguration," in the Proc. of 12th Intl. Conf. on Fault Tolerant Systems and Diagnostics, Prague (CSSR), September 1989, pp. 282-287.
85. A. K. Somani and T. Sarnaik, "Reliability Analysis Techniques for Complex Multiple Fault Tolerant Computer Architectures," IEEE Transactions on Reliability, Vol 39, No. 5, Dec. 1990, pp. 547-556. This paper is based on earlier work presented as "Reliability Analysis and Comparison of Two Fail-op/Fail- op/Fail-safe Architectures," in the Proc. of FTCS-19, Chicago, June 1989, pp. 566-573.
86. A. K. Somani, V. K. Agarwal and D. Avis, "Complexity of Single Fault Diagnosability and Diagnosis Problems," IEEE Transactions on Computers, Vol. c-38, no. 2, February 1989, pp. 195-201. This paper is based on earlier work presented as "On Complexity of Diagnosability and Diagnosis Problems in System-Level Diagnosis," in the Proc. of IEEE FTCS-16, Vienna, Austria, July 1986, pp. 232-237.
87. A. K. Somani and V. K. Agarwal, "Diagnosis in Hybrid Fault Situations in the BGM Model and the Unified t-Characterization Theorem," Intl. Journal of Computer Mathematics and Applications, Vol. 13, no. 5/6, May-June 1987, pp. 567-576.
88. A. K. Somani, V. K. Agarwal and D. Avis, "A Generalized Theory for System-Level Diagnosis," IEEE Transactions on Computers, Vol. c-36, no. 5, May 1987, pp. 538-546. This paper is based on earlier work presented as "A Generalized Theory for System-Level Diagnosis," in the Proc. International Conference on Computer Design-85, Portchester, New York, November 1985, pp. 707-711.
89. A. K. Somani and V. K. Agarwal, "An Efficient Unsorted VLSI Dictionary Machine," IEEE Transactions on Computers, Vol. c-34, no. 9, September 1985, pp. 841-852. This paper is based on earlier work presented as "An Unsorted Dictionary Machine," in the Proc. of Canadian VLSI Conference, University of Waterloo, Waterloo, Canada, October 1983, pp. 80-83, and "An Efficient VLSI Dictionary Machine," in the Proc. of IEEE Symposium of Computer Architectures-1984, University of Michigan, Ann Arbor, U.S.A., June 1984, pp. 142-150.

Conference Proceedings (Does not include papers that are listed above):

1. A. K. Somani, "Efficient Protection and Grooming Architectures for Future Optical Networks," in the Proc. of the Asia Communication and Photonics Conference and Exhibition (APC) 2009, Shanghai, China, Nov 2-6, 2009.
2. A. K. Somani and K. Celik, "Autonomous Aero-Visual and Sensor Based Inspection Network for Asset Monitoring (invited Paper)," in Proc. of the 7th International Workshop on the Design of Reliable Communication Networks (DRCN 2009), Washington DC, October 25-28, 2009.
3. K. Celik, S. J. Chung, M. Clausman, and A. K. Somani, "Monocular Vision SLAM for Indoor Aerial Vehicles," in Proc. of the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), St. Louis, MO, Oct. 2009.
4. A. Gumaste, S. Jain, and A. K. Somani, "An Efficient Superscheduler Architecture and Job Migration Algorithm for Computational Grids over Light-trail WDM Networks: Invited Paper," in Proc. of IEEE and Createnet Broadnets 2009, Sept. 2009, Madrid Spain, Sept. 12-16, 2009.
5. A. Gumaste and A. K. Somani, "Scheduling Algorithms in LiTPiC Digital Optical Networks using Light-trails and Photonic Integrated Circuits," in Proc. of IEEE Globecom 2009.
6. J. Ding and A. K. Somani, "An Improved Algorithm for the Inverse Optimization of Mixed Integer Linear Programming," in Proc. of CORS/INFORMS 2009, pp. 1-8.
7. N. D. P. Avirneni, V. Subramanian, and A. K. Somani, "Low Overhead Soft Error Mitigation Techniques for High-Performance and Aggressive Systems," in Proc. of DCCS-DSN 2009, June 2009.
8. V. Subramanian, P. K. Ramesh, and A. K. Somani, "Managing the Impact of On-chip Temperature on the Lifetime Reliability of Reliably Overclocked Systems," in Proc. of 2009 Second International Conference on Dependability (DEPEND 2009), June 2009.
9. K. Celik, S. J. Chung, and A. K. Somani, "Biologically Inspired Monocular Vision Based Navigation and Mapping in GPS-Denied Environments," in Proc. of AIAA Infotech@Aerospace, Unmanned-Unlimited, Apr 6-9, 2009, Seattle WA.
10. P. K. Ramesh, V. Subramanian, and A. K. Somani, "Thermal Management in Reliably Overclocked Systems," in Proc. of SELSE 2009, March 2009.
11. N. D. P. Avirneni, V. Subramanian, and A. K. Somani, "Soft Error Mitigation Schemes for High Performance and Aggressive Designs," in Proc. of SELSE 2009, March 2009.
12. S. Kher, G. Subramanian, P. Ramesh, and A. K. Somani, "Greedy Dynamic Crossover Management in Hardware Accelerated Genetic Algorithm Implementations using FPGA" in Proc. of in UKSIM 2009, March 2009.
13. D. Lastine and A. K. Somani, "Fault Tolerant Multicast-Couple Hop Routing over Light-Trails," in Proc. of the 2008 IEEE ANTS Conference, IIT/Mumbai, Dec 15, 2008, pp. 1-6.
14. V. Subramanian and A. K. Somani, "Conjoined Pipeline: Enhancing Hardware Reliability and Performance through Organized Pipeline Redundancy," in 14th IEEE Pacific Rim International Symposium on Dependable Computing, PRDC '08, 15-17 Dec. 2008, pp. 9-16.
15. K. Celik, S. J. Chung, and A. K. Somani, "MVCSLAM: Mono-Vision Corner SLAM for Autonomous Micro-Helicopters in GPS Denied Environments," in Proc. of GNC'08, AIAA, 2008, pp. 1-14.
16. N. Gaddam, S. A. Gathala, D. W. Lastine and A. K. Somani, "Energy Minimization through Network Coding for Lifetime Constrained Wireless Networks" in Proc. of IEEE ICCCN 2008, August 2008, pp. 1-6.
17. S. Balasubramanian, A. K Somani, "A Comparative Study of Path Level Traffic Grooming Strategies for WDM Optical Networks with Dynamic Traffic - Invited Paper," IEEE ICCCN 2008, pp. 1-6.

18. Jin-Wei Tioh, R. Bahuguna, N. VanderHorn, M. Mina, R. J. Weber, A. K. Somani, "Reprogrammable High-Speed Platform: Bridging the Gap Between Research, Education, and Engineering," in Proc. of IEEE Electronics and Information Technology, May 2008.
19. B. Joshi, T. Vincent, J. Chen, and A. K. Somani, "Hierarchical Plug-and-Play Self-Diagnosable Intelligent Sensor Networks for Process Control," in Proc. of IEEE Electronics and Information Technology, May 2008.
20. K. Celik, S. J. Chung, A. K. Somani, "Mono-Vision Corner SLAM for Indoor Navigation," in Proc. of IEEE Electronics and Information Technology, May 2008, pp. 343-348. **Won one of three best paper awards.**
21. D. Lastine and A. K. Somani, "Supplementing non-simple p-Cycles with preconfigured lines," IEEE ICC, May 2008, pp. 5443-5447.
22. V. Subramanian and A. K. Somani, "Conjoined Processor: A Fault Tolerant High Performance Micro-processor," in Proc. of SELSE 2008, Austin, TX, March 2008.
23. M. T. Frederick and A. K. Somani, "Beyond the arithmetic constraint: depth-optimal mapping of logic chains in LUT-based FPGAs," in Proc. of FPGA-2008, Feb 2008, pp. 37-46.
24. S. Balasubramanian, A. K. Somani, "Dynamic Survivable Network Design for Path Level Traffic Grooming in WDM Optical Networks," IEEE Globecom 2007, November 2007, pp. 2359-2363.
25. M. T. Frederick and A. K. Somani, "Non-arithmetic Carry Chains for Reconfigurable Fabrics" in Proceedings of the 15th International Conference on Computer Design, October 2007, pp. 137-143. **Won the best paper award.**
26. W. He and A. K. Somani, "Comparison of Protection Mechanisms: Capacity Efficiency and Recovery Time," in Proc. of IEEE ICC 2007, June 2007.
27. V. Subramanian, M. Bezdek, N. D. Avirneni and A. K. Somani, "Superscalar Processor Performance Enhancement Through Reliable Dynamic Clock Frequency Tuning, in Proc. of DCCS-DSN 2007, June 2007, pp. 196-205.
28. A. K. Somani and S. Kher, "Net-centric computing: The Future of Computers and Networking," and invited paper in Proc. of IEEE International conference ICDCIT 06, Bhubaneswar, India, Dec.2006, pp. 14-26.
29. T. S. Ganesh, V. Subramanian and A. K. Somani, "SEU Mitigation Techniques for Microprocessor Control Logic," in Proc. of sixth European Dependable Computing Symposium, Coimbra, Portugal, Oct 18-20, 2006, pp. 77-86.
30. S. Balasubramanian and A. K. Somani, "On Traffic Grooming Choices for IP over WDM networks (Invited)," in Proc. of Broadnets, San Jose, CA, Oct. 1-5, 2006.
31. M. Sivakumar, K. M. Sivalingham, and A. K. Somani, "Partial Protection in Optical WDM Networks: Enhanced Support for Dynamic Traffic," in Proc. of Broadnets, San Jose, CA, Oct. 1-5, 2006.
32. J. Chen, S. Kher, A. K. Somani, "Distributed Fault Detection of Wireless Sensor Networks," in Proc. of DIWANS 06, LA, Sept. 2006.
33. M. T. Frederick and A. K. Somani, "Multi-Bit Carry Chains for High-Performance Reconfigurable Fabrics," in 16th International Conference on Field Programmable Logic and Applications, Madrid, August 28-30 2006, pp. 275-280.
34. S. Kher, J. Chen, A. K. Somani, "IEEE 1451, Standard and Wireless Sensor Networks: An Overview of Fault Tolerant Algorithms," in IEEE EIT 2006, East Lansing, MI, May 2006.
35. J. Chen, S. Kher, A. K. Somani, "Energy Efficient Model for Data Gathering in Structured Multiclustered Wireless Sensor Networks," in Proc. of IPCCC 2006, Phoenix, USA, April 2006.

36. N. VanderHorn, S. Balasubramanian, M. Mina, R. J. Weber, A. K. Somani, "Light-Trail Testbed for Metro Optical Networks," in 2nd International IEEE/Create-Net Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities, TridentCom, March 2006, pp. 6-12.
37. H. Xu and A. K. Somani, "Partitioned Cache Shadowing for Deep Sub-Micron (DSM) Regime," in Proc. of Pacific Rim Dependability Symposium, Chnagsha, PRC, Dec 2005, pp/ 183-192.
38. S. Kher, Ganesh T.S., and A. K. Somani, "Dynamic Crossover Management in Hardware Accelerated Implementations of Genetic algorithms," ICIS2005, International Conference on Intelligent Systems, Dec.1-3, 2005, Kualalumpur, Malaysia.
39. S. Kher, A. K. Somani, R. Gupta, "Network Selection Using Fuzzy Logic," in BROADNETS 2005 conference, Oct. 2005, Boston, USA, pp. 941-950.
40. S. Balasubramanian, W. He, A. K. Somani, "Light-Trail Networks: Design and Survivability," in Proc. of IEEE Local Computer Networks (LCN) 2005, November 2005, pp 174-181.
41. W. He, J. Fang, and A. K. Somani, "A p-cycle based Survivable Design for Dynamic Traffic in WDM Networks," in Proc. of IEEE Globecom 2005, November 2005 (5 pages).
42. M. Mina and A. K. Somani and A. Tyagi and D. Rover and M. Feldmann and M. Shelley, "Learning Streams: A Case Study in Curriculum Integration," in Proc. of Frontiers in Education, October 2005.
43. S. Balasubramanian, A. K.Somani, and A. E. Kamal, "Sparsely Hubbed Light-Trail Networks," IEEE ICCCN, October 2005, pp. 249-254.
44. S. Balasubramanian, A. E. Kamal, and A. K.Somani, "Network Design for IP-Centric Light-Trail Networks," in Proc. of Broadnets 2005, October 2005, pp. 45-54.
45. R. Gupta, and A. K. Somani, "Game Theory As a Tool to Strategize as well as Predict Nodes Behavior in Peer-to-Peer Networks," in the proceedings of the 11th International Conference on Parallel and Distributed Systems Volume 1, 20-22 July 2005, Vol. 1, pp. 244-249.
46. M. Mina, R. Weber, A. K Somani, N. VanderHorn, and R. Bahuguna, "High Speed Systems Engineering: A new approach in Electrical and Computer Engineering," 2005 ASEE Annual Conference and Exposition, Portland, Oregon, July 2005.
47. M. T. Frederick, N. A. VanderHorn, and A. K. Somani, "Real-time Hardware Implementation of the Approximate Discrete Radon Transform," in Proc. of the 16th International Conference on Application-Specific Systems, Architectures and Processors (ASAP), July 2005, pp. 399-404.
48. J. Fang, M. Sivakumar, A. K. Somani and K. M. Sivalingam, "On Partial Protection in Groomed Optical WDM Mesh Networks," in Proc. of IEEE International Conference on Dependable Systems and Networks (DSN) - Dependable Computing and Communications Symposium (DCCS), (Yokohama, Japan), June 2005, pp. 228-237 .
49. J. Fang and A. K. Somani, "IP Traffic Grooming over WDM Optical Networks," in Proc. of 9th IFIP/IEEE conference on Optical Networks Design and Modeling (ONDM), Milan, Italy, February 2005, pp. 393-402.
50. N. VanderHorn, M. Mina, A. K. Somani, "Light Trails: A Passive Optical Networking Solution for Wavelength Sharing in the Metro," U.S. Pakistan International Conference on High Capacity Optical Networks and Enabling Technologies, HONET 2004, December 2004.
51. R. Gupta and A. K. Somani, "An Incentive Driven Lookup Protocol For Chord-Based Peer-to-Peer (P2P) Networks," in the Proc. of HiPC, Bangalore, India, December 2004, pp. 1-6. (**Best paper award**).
52. R. Gupta and A. K. Somani, "A Pricing Strategy For Incentivizing Selfish Nodes To Share Resources In Peer-to-Peer (P2P) Networks," in the Proceedings of IEEE International Conference on Networks, Singapore, November 2004.

53. M. T. Frederick, P. Datta and A. K. Somani, "Evaluating Dual-Failure Restorability in Mesh-Restorable WDM Optical Networks Using Sub-Graph Routing," in ICCCN, Chicago, IL, October 2004, pp.309-314.
54. R. Sangireddy and A. K. Somani, "Exploiting Quiescent States in Register Lifetime," in Proceedings of ICCD2004, The IEEE 22nd International Conference on Computer Design, October 2004, pp. 368-374.
55. P. Datta and A. K. Somani, "Diverse Routing for Shared Risk Resource Groups (SRRG's) in WDM optical networks," in Proc. of First International Conference on Broadband Networks, October 2004, pp. 120-129.
56. R. Gupta, and A. K. Somani, "Reputation Management Framework and its Use as Currency in Large-Scale Peer-to-Peer Networks," In Proc. of the Fourth International Conference on Peer-to-Peer Computing, August 2004 pp. 124-130.
57. R. Gupta, and A. K. Somani, "CompuP2P: An Architecture for Sharing of Computing Resources In Peer-to-Peer Networks With Selfish Nodes," In Online Proceedings of Second Workshop on the Economics of Peer-to-Peer Systems, Harvard University, June 2004.
58. J. Fang, W. He and A. K. Somani, "Optimal Light Trail Design in WDM Optical Networks," in proceedings of ICC 2004, Vol. 3, June 2004, pp. 1699-1703.
59. M. T. Frederick, N. VanderHorn, and A. K. Somani, "Light trails: a sub-wavelength solution for optical networking," High Performance Switching and Routing (HPSR) Workshop, May 2004 pp. 175-179.
60. W. He, J. Fang, A. K. Somani, "On Survivable Design in Light Trail Optical Networks," in Proceeding of 8th IFIP Working Conference on Optical Network Design and Modeling, February 2004, pp. 155-172.
61. S. Balasubramanian, A. Kamal, A. K. Somani, "Medium Access Control Protocols For Light Trail and Light Bus Networks," in Proceeding of 8th IFIP Working Conference on Optical Network Design and Modeling, February 2004, pp. 225-244.
62. R. Sangireddy, H. Kim, and A. K. Somani, "Timing Issues of Operating Mode Switch in High Performance Reconfigurable Architectures," in Proceedings of HiPC2003, The Tenth Annual International Conference on High Performance Computing, December 2003, pp. 22-33.
63. Tao Wu, A. K. Somani, "Necessary and Sufficient condition for k crosstalk attacks localization in all-Optical Networks," Proceeding of IEEE Globecom 2003, December 2003, paper OP02-5.
64. W. He, A. K. Somani, "Path-based Protection for Surviving Double-Link Failures in Mesh-Restorable Optical Networks," Proceeding of IEEE Globecom 2003, December, 2003, paper OP02-8.
65. J. Fang and A. K. Somani, "Enabling sub-wavelength level traffic grooming in survivable WDM optical network design," Proceeding of IEEE Globecom 2003, December 2003, paper OP03-9.
66. N. Jose and A. K. Somani, "Connection Rerouting/Network Reconfiguration," in 4th International Workshop on the Design of Reliable Communication Networks (DRCN 2003), Banff, Alberta, Canada, October 2003, pp. 23-30.
67. R. Sangireddy and A. K. Somani, "Application-Specific Computing with Adaptive Register File Architectures," in Proceedings of ASAP 2003, The IEEE 14th International Conference on Application-specific Systems, Architectures and Processors, June 2003, pp. 183-193.
68. R. Al-Omari, G. Manimaran, M. V. Salapaka and A. K. Somani, "Novel algorithms for open-loop and closed-loop scheduling of real-time tasks in multiprocessor systems based on execution time estimation," in Proc. IEEE Intl. Parallel and Distributed Processing Symposium (IPDPS), pp. 7-14, Nice, France, April 2003. (Acceptance rate: 30%)
69. A. K. Somani and J. Zhou, "Achieving Fairness in Distributed Scheduling in Wireless Ad-Hoc Networks," in Proceedings of IEEE International Performance, Computing, and Communications Conference (IPCCC), April 2003, pp. 95-102. Won the **Best paper award**.

70. J. Chen and A. K. Somani, "Fair Scheduling in wireless Ad-Hoc Networks of Location Dependent Channel Errors," in Proceedings of IEEE International Performance, Computing, and Communications Conference (IPCCC), April 2003, pp. 103-110.
71. P. Datta, M. Sridharan, and A. K. Somani, "A Simulated Annealing Approach for Topology Planning and Evolution of Mesh-Restorable Optical Networks," in proceedings of the 7th IFIP Working Conference on Optical Network Design & Modeling, ONDM-2003, Budapest Hungary, February 2003.
72. R. Srinivasan and A. K. Somani, "Analysis of optical networks with heterogeneous grooming capability," in proceedings of the 7th IFIP Working Conference on Optical Network Design & Modeling, ONDM-2003, Budapest Hungary, February 2003.
73. M. Fredrick and A. K. Somani, "A single-fault recovery strategy for optical networks using subgraph routing," in proceedings of the 7th IFIP Working Conference on Optical Network Design & Modeling, ONDM-2003, Budapest Hungary, February 2003.
74. N. Vanderhorn and A. K. Somani, "RDFN - Robust, Dynamic and Fair Network: A High-Speed Option for Metropolitan Area Networks," in proceedings of the 7th IFIP Working Conference on Optical Network Design & Modeling, ONDM-2003, Budapest Hungary, February 2003.
75. D. Sahoo, S. Swaminathan, R. A. Omari, M. V. Salapaka, G. Manimaran, A. K. Somani, "Feedback control for real-time scheduling," in Proc. American Control Conference (ACC), pp.1254-1259, Anchorage, AL, 2002.
76. R. Srinivasan and A. K. Somani, "Analysis of multi-rate traffic in WDM grooming networks," in Proc. of IEEE ICCCN 2002, October 2002, pp. 296-301.
77. Tao Wu and A. K. Somani, "Necessary and Sufficient Condition for Crosstalk Attack Localization in All-Optical Networks," in Proceedings of APOC002, October 2002.
78. M. Mina and A. K. Somani, "On Physical Considerations in Design of Wavelength Grooming Optical Networks," in Proceedings of 40th Annual Allerton Conference on Communication, Control, and Computing, October 2002.
79. M. Sridharan, R. Srinivasan, and A. K. Somani, "Dynamic Routing with Partial Information in Mesh-Restorable Optical Networks," in the Sixth Working Conference on Optical Networks Design and Modelling, February 2002.
80. A. K. Somani, and M. Mina, "Challenges and Issues in Design of 2nd Generation Optical Networks," Invited talk at the 6th World MultiConference on Systemic and Cybernetics and Information, Orlando, Florida, July 1418, 2002.
81. R. Srinivasan and A. K. Somani, "Request-specific routing in WDM grooming networks," in the Proceedings of the IEEE International Conference on Communications, April, 2002, Volume: 5, Pages: 2876-2880.
82. M. Sridharan, R. Srinivasan, and A. K. Somani, "Dynamic routing with partial information in mesh-restorable optical networks," in Proceedings of the the Sixth Working Conference on Optical Networks Design and Modelling, February, 2002.
83. S. Kim and A. K. Somani, "SSD: An affordable fault-tolerant architecture for superscalar processors," in Proc. of IEEE 2001 Pacific Rim International Symposium on Dependable Computing (PRDC), December, 2001. pp. 27-34.
84. M. Mina and A. K. Somani, "Wavelength Conversion Technology and the impact on future optical networks," 39th Annual Allerton Conference on Communication, Control, and Computing, October 2001.
85. R. Srinivasan and A. K. Somani, "On the blocking performance of tree establishment in time-space switched optical networks," in Proceedings of OPTICOMM 2001, August, 2001.
86. S. Kim and A. K. Somani, "An Affordable Transient Fault Tolerance for Superscalar Processors," Fast Abstract of IEEE DSN-2001, July 2001.

87. J. B. Nickel and A. K. Somani, "REESE: A Method of Soft Error Detection in Microprocessors," in Proc. of International Conference on Dependable Systems and Networks, June 2001, pp. 401-410.
88. S. Thiagarajan and A. K. Somani, "A Capacity Correlation Model for WDM Networks with Grooming Capabilities," in Proc. IEEE Intl. Conf. Comm. 2001, June 2001, Helsinki, Finland, pp. 1592 -1596.
89. R. Al-Omari, A. K. Somani, and G. Manimaran, "A New Fault-Tolerant Technique for Improving Schedulability in Multiprocessor Real-Time Systems," in Proc. of IPDPS 2001, pp. 32, April 2001.
90. G. Manimaran, V. V. Sastry, and A. K. Somani, "The role of academia in Internet- enabled embedded technology," in Proc. Natl. Conf. on Intelligent Systems and VLSI, Calcutta, India, February 2001.
91. S. Thiagarajan and A. K. Somani, "Performance Analysis of WDM Optical Networks with Grooming Capabilities," in Proc. SPIE Intl. Symp. on Voice, Video, and Data Comm.-Terabit Optical Networking: Arch., Control, and Management, Boston, MA, USA, November 2000, pp. 253-262.
92. M. Sridharan, M. V. Salapaka, and A. K. Somani, "Operating Mesh-Survivable WDM Transport Networks," in Proceedings of SPIE Terabit Optical Networking: Architecture, Control, and Management Issues, Boston, November 2000, pp. 113-123.
93. J. Zhou, G. Manimaran, and A. K. Somani, "A dynamic scheduling algorithm for improving performance index in multiprocessor real-time systems," in Proc. Intl. Conf. on Advanced Computing (ADCOM), Roorkee, India, December 1999, pp. 45-49.
94. F. M. G. Dorenberg, H. S. Kim, and A. K. Somani, "The effect of interconnect schemes on the dependability of a modular multi-processor system with shared resources," in 1999 Pacific Rim International Symposium on Dependable Computing, December 1999, Hong Kong, pp. 103 -110,
95. L. Li and A. Somani, "Fiber Requirement in Multifiber WDM Networks with Alternate-Path Routing," in Proc. ICCCN'99, Boston, MA, October 1999, pp.338 -343.
96. I. Peddibhotla and A. K. Somani, "Experimental Evaluation of Throughput Performance of IRTCP Under Noisy Channels," in the Proc. of WoWMoM 1999, July 1999.
97. G. Krishnamurthi, A. K. Somani, "Effect of Failures on Optimal Location Management Algorithms," in Proceedings of the *29th Annual IEEE Fault Tolerant Computing Symposium*, Madison, Wisconsin, June 1999, pp. 110-119.
98. M. Bhaskar, A. K. Somani, and M. Azizoğlu, "Interference Robust TCP," in Proceedings of the *29th Annual IEEE Fault Tolerant Computing Symposium*, Madison, Wisconsin, June 1999, pp. 102-109.
99. G. Krishnamurthi, S. Chessa, A. K. Somani, "Optimal Replication of Location Information in Mobile Networks," in Proceedings of the International Conference on Communications, Vancouver B.C., June 1999, pp. 1768-1772.
100. R. Al-Omari, G. Manimaran, and A. K. Somani, "A Fault-Tolerant Dynamic Scheduling Algorithm for Multiprocessor Real-Time System," Fast Abstract, 29th Annual IEEE Fault-Tolerant Computing Symposium, Fast Abstracts, June 1999, pp. 63-64.
101. A. K. Somani and S. Kim, "Area Efficient Architectures for Information Integrity Checking in Cache Memories," in the Proceedings of Internation Symposium on Computer Architecture (accepted 26 out of 135 papers), May 1999, pp. 246-256.
102. H. S. Kim, A. K. Somani, and A. Tyagi, "On Reconfiguring Cache for Computing," in Proceedings FCCM '99, April 1999, pp. 296-297.
103. D. Deshpande, A. K. Somani, and A. Tyagi, "Hybrid Data/Configuration Caching for Striped FPGA," in the Proceedings of FCCM '99, April 1999, pp. 298-299.
104. D. Deshpande, A. K. Somani, and A. Tyagi, "Configuration Scheduling Schemes for Striped FPGA," in the Proceedings of FPGA 99, February 1999, pp. 206-214.
105. D. Twigg, U. Sandadi, T. Sharma, and A. K. Somani, "Reliability Analysis of Systems which Operate in Duty Cycles," in Proc. of RAMS 1999, Jan. 1999.

106. M. Sridharan, S. Ramasubramanian, and A. K. Somani, "HIMAP: Architecture, Features and Hierarchical Model Specification Techniques," in Proc. of 10th Intl. Conf. on Modelling, Techniques, and Tools for Computer Performance Evaluation, held at Palma de Mallorca, Balearic Island, Spain, September 1998, pp. 348-351.
107. A. K. Somani and T. Sakaguchi, "Hierarchical Stochastic Reward Net: Methodology and Solver Package," in Proc. of 10th Intl. Conf. on Modelling, Techniques, and Tools for Computer Performance Evaluation, to be held at Palma de Mallorca, Balearic Island, Spain, September 1998, pp. 369-373.
108. S. Kim and A. K. Somani, "Low-cost protection codes for on-chip cache memories," Fast Abstract in conjunction with IEEE FTCS-98, held in Munich, June 1998.
109. S. Subramaniam, M. Azizoglu, and A. K. Somani, "On the optimal placement of wavelength converters in wavelength-routed networks," in the Proc. of INFOCOM '98, pp. 837-844, March 1998.
110. A. Anand and A. K. Somani, "Hierarchical Analysis of Fault Trees with Dependencies, Using Decomposition," in the Proc. of RAMS-1998, Los Angeles, CA, pp. , January 1998.
111. A. K. Somani, "Reliability Modeling of Structured Systems: Exploring Symmetry in State Space Generation," in the Proc. of 1997 Pacific Rim International Symposium on Fault Tolerant Systems, Taipei, Taiwan, pp. 78-84, December 1997.
112. A. K. Somani and K. S. Trivedi, "A Cache Error Propagation Model," in the Proc. of 1997 Pacific Rim International Symposium on Fault Tolerant Systems, Taipei, Taiwan, pp. 15-21, December 1997.
113. A. K. Somani and S. Kim, "Transient Fault Detection in Cache Memories by Employing a Small Shadow Cache," in Proc. of DCCA-6, March 1997, pp. 21-46.
114. A. K. Somani and A. Sansano, "Improving Communication Performance in Multiprocessor Systems," in the Proc. of Trends in Advanced Computing, Bangalore, India, December 1996, pp. 213-225.
115. G. Krishnamurthi, A. Gupta, and A. K. Somani, "The HIMAP Modeling Environment," in Proc. of PDCS-96, Sept. 24-27, 1996, Dijon, France.
116. B. Sklar and A. K. Somani, "Ray Tracing Parallelization via Image Decomposition and Performance Impact," in the Proc. of ICPP-96, August 1996, pp. II/108-III/115.
117. R. Lang, A. Spray, and A. K. Somani, "Performance/Area Tradeoffs in Tree-Based VLSI Architectures for the Two-Dimensional Wavelet Transforms," in Wavelet Applications III, Harold H. Szu, Editor, Proc. SPIE 2762, 621-631 (1996).
118. D. Fura and A. K. Somani, "Abstract-Directed Synthesis of VHDL Test Benches," VHDL International Users' Forum, Santa Clara, CA, Feb-Mar 1996.
119. H. ElGindy, A. K. Somani, H. Schröder, H. Schmeck, and A. Spray, "RMB – A Reconfigurable Multiple Bus Network," in Proc. of Second High Performance Computer Architecture Symposium, February 1996, pp. 108-117.
120. U. Reddy, S. Tridandapani, and A. K. Somani, "Effect of Diagnosis Coverage and Preemption Latencies on Fault Diagnosis Schemes Using Idle Capacity in Multiprocessor Systems," in the Proc. of 1995 Pacific Rim International Symposium on Fault Tolerant Systems, Newport Beach, CA, December 1995, pp. 213-218.
121. Y. Eom, S. B. Choi, and A. K. Somani, "Fault Tolerant Embedding Algorithm for Complete Binary Tree in Hypercube," in the Proc. of 1995 Pacific Rim International Symposium on Fault Tolerant Systems, Newport Beach, CA, December 1995, pp. 178-183.
122. A. Sansano and A. K. Somani, "The Communication System of the Proteus Parallel Computer," in the Proc. of Second Intl. Workshop on Parallel Processing, New Delhi, India, December 1995, pp. 635-640.
123. A. K. Somani, A. Gupta, and T. Sharma, "Fault Management in Dynamic Packet Switched Networks," in Proc. of Fault Tolerant Systems and Software, Madras, India, pp. 148-157, December 1995.

124. D. Fura and A. K. Somani, "Transaction-Level Specification of VHDL Design Models," in VHDL International Users' Forum, October 1995.
125. D. Fura and A. K. Somani, "Specification Directed Synthesis of Test Benches," in T. Melham and J. Camilleri (eds.), Higher Order Logic Theorem Proving and its Applications, Lecture Notes in Computer Science, 859, Springer-Verlag, 1995.
126. S. Subramaniam, M. Azizoğlu, and A. K. Somani, "Effect of Wavelength Converter Density on the Blocking Performance of All-Optical Networks," LEOS workshop, San Francisco, CA, Oct 1995, pp. 210-211, October 1995.
127. S. Subramaniam and A. K. Somani, "Connectionless Traffic Service in ATM Networks," at the Seventh IEEE Workshop on Local and Metropolitan Area Networks, Duck Key, Marathon, Florida, March 26-29, 1995.
128. A. K. Somani, U. Reddy, T. Sharma, and D. Twiggs, "An Efficient Decomposition Technique for Markov-Chain Analysis," in the Proc. of RAMS, Jan. 1995, pp. 465-471.
129. A. K. Somani and A. Sansano, "The Impact of Coarse Grain Parallelism: A study on Proteus and Paragon Supercomputers," in the Proc. of First Intl. Workshop on Parallel Processing, Bangalore, India, Dec. 1994.
130. K.-S. Song and A. K. Somani, "Adaptive Resource Management for LAN Interconnection in Wide Area ATM Networks," in the Proc. of ICCCN-94, pp. 148-152.
131. D. Fura and A. K. Somani, "Component Interval Semantics and Efficient Verification of Transaction-Level Circuit Behavior," in T. Melham and J. Camilleri (eds.), Higher Order Logic Theorem Proving and its Applications, Lecture Notes in Computer Science, 859, Springer-Verlag, 1994, pp. 205-220.
132. T. Sarnaik and A. K. Somani, "HUV concept and Its Application in Real-Time systems," in the Proc. of FTCS 94, Austin, June 1994, pp. 6-15.
133. C. Chen and A. K. Somani, "A Cache Protocol for Error Detection and Recovery in Fault-Tolerant Computing Systems," in the Proc. of FTCS 94, Austin, June 1994, pp. 278-287.
134. K.-S. Song and A. K. Somani, "Interworking Connectionless Service with ATM Network for Multimedia Communication," in the Proc. of 5th IEEE COMSOC Workshop, MULTIMEDIA '94 Kyoto, Japan, May 1994.
135. S. Tridandapani, J. S. Meditch, and A. K. Somani, "The MaTPi protocol: Masking Tuning Times Through Pipelining in WDM Optical Networks," in the Proc. of IEEE INFOCOM 1994, pp. 1528-1535.
136. K.-S. Song and A. K. Somani, "Fault Tolerant ATM Backbone Network Design Considering Cell Loss Rates and End-to-End Delay Constraints," in the Proc. of Computer and Communication '94 Phoenix Conference, March 1994, pp. 119-125.
137. A. K. Somani, T. Sharma, and P. Nguyen, "Reliability Computation of Systems with Latent Failures and Monitoring Chains," in the Proc. of RAMS-1994, at Los Angeles, Jan. 1994, pp. 195-200.
138. D. Fura, Phillip J. Windley, and A. K. Somani, "Abstraction Techniques for Modeling Real-World Interface Chips," in J. Joyce and C. Segar (eds.), Higher Order Logic Theorem Proving and its Applications, Lecture Notes in Computer Science, 780, Springer-Verlag, 1994, pp. 269-282.
139. T. R. Sarnaik and A. K. Somani, "The HUV concept and its benefits in Real-Time Systems," in the Proc. of Pacific Rim fault Tolerant Symposium, Melbourne, Australia, Dec 1993.
140. C. Wittenbrink and A. K. Somani, "Permutation warping for volume rendering," in the Proc. of the Fifth Annual Western Computer Graphics Symposium, Silver Star Mountain, British Columbia, 1993.
141. R. M. Haralick, Y. H. Yao, L. G. Shapiro, I. T. Phillips, A. K. Somani, J. N. Hwang, M. Harrington, C. Wittenbrink, C. H. Chen, X. Liu, S. Chen, "Proteus Management and Control System," in Proc. of 1993 Computer Architecture and Machine Perception, New Orleans, LA, Dec. 1993, pp. 101-108.

142. A. K. Somani, "Design of an Efficient Network," in the Proc. of 7th International Parallel Processing Symposium, Newport Beach, CA, April 13-16, 1993, pp. 413-418.
143. G. Greenwood and A. K. Somani, "A methodology for Mapping Pipelined Algorithms onto Hypercube Arrays," in the Proc. of 5th IEEE Conference on Parallel and Distributed Computing, December, 1992, Teipai, pp. 386-391.
144. T. Sarnaik and A. K. Somani, "On Reducing Test Time and Meeting Deadlines in Real Time Systems," in the Proc. of the First Asian Test Symposium, November 1992 at Hiroshima, Japan, pp. 123-128.
145. A. K. Somani and J. Wang "Probabilistic Diagnosis in Wafer Scale Systems," in the Proc. of Defect and Fault Tolerance Workshop, November 1992, Dallas, TX, pp. 147-156.
146. C. Chen and A. K. Somani, "Fault Tolerant parallel Processing with Real-Time Error Detection and Recovery," in the Proc. of 26th Asilomar Conf. on Signal, Systems, & Computers, October 1992.
147. C. Chen and A. K. Somani, "Error Detection and Recovery in Fault Tolerant Processor Systems Using Caches," in the Proc. of 5th Conf. of ISMM on Parallel and Distributed Systems, October 1992, Pittsburgh, pp. 388-393.
148. T. Kanungo, G. Chiou, A. K. Somani, and R.M. Haralick, "Morphological Image Processing on a Token Passing Pyramid Computer," In the Proc. of International Conference on pattern Recognition, The Hague, Netherlands, August 1992.
149. C. Chen and A. K. Somani, "Effect of Cache Traffic on Shared-Bus Multiprocessor Systems," in the Proc. of ICPP-92, August 1992, Chicago, IL, pp. I285-I288.
150. M. Csoppensky and A. K. Somani, "Distributed Routing Algorithms and Their Performances for Enhanced Hypercube Architecture," in the Proc. of IEEE Phoenix Conference on Computers and Communications, Phoenix, AZ, March 1992, pp. 15-20.
151. A. K. Somani, C. Wittenbrink, R. M. Haralick, L. G. Shapiro, J. N. Hwang, C. Chen, R. Johnson, and K. Cooper, "Proteus System Architecture and Organization," in the Proc. of 5th International Parallel Processing Symposium, June 1991, pp. 287-294.
152. D. Van Alen and A. K. Somani, "An All Digital Phase Locked Loop Implementation of a Fault Tolerant Clock," in the Proc. of ICCAS-91, June 1991, pp. 673-677.
153. A. K. Somani and M. Lee, "A Comparative Study of Synchronous and Non-Synchronous Transmission Algorithms on a Replicated Token Bus Network," in the Proc. of IEEE PCCC-91, March 1991, pp. 674-680.
154. A. K. Somani, "High-Performance High-Integrity Computer Systems," in the Proc. of Northcon-90, at Seattle, WA, October 1990, pp. 2-7.
155. C. Tarnag, J. A. Meditch, and A. K. Somani, "Multicasting Copy Network Architecture," in the Proc. of ITC-90, October 1990.
156. A. Menn and A. K. Somani, "An Efficient Sorting Algorithm for the Star Graph Interconnection Network," in the Proc. of ICPP-90, August 1990, pp. III/1-III/8.
157. A. K. Somani and M. Bagha, "Meshkin: A Fault Tolerant Computer Architecture with Distributed Fault Detection and Reconfiguration," in G. Gorke and H. Sorensen (eds.), Automation, systems, Methods, and Applications, Lecture Notes in Computer Science, 214, (Proc. of 4th Intl. Conf. on Fault Tolerant Computing Systems Baden Baden, September 1989) Springer-Verlag, 1989, pp. 197-208.
158. A. K. Somani and S. Sonawala, "An Echo-Back Protocol for Fault Tolerant Bus Architecture," in the Proc. of Phoenix Conference on Computer and Communication, March 1989, pp. 14-18.
159. A. K. Somani, N. Penla, and S. Choi, "Multiple Path Multistage Interconnection Network with Low Overhead," in the Proc. of ISMM Intl. Symp. on Mini and Microcomputers, Miami Beach, Florida, December 1988, pp. 69-72.

160. A. K. Somani and G. D'Souza, "On the Power of two Level of Communication in a Malicious Environment," in the Proc. of ISMM Intl. Symp. on Mini and Microcomputers, Miami Beach, Florida, December 1988, pp. 332-335.
161. A. K. Somani and F. Mamaghani, "Efficient Parallel Implementable Algorithms for Line of Sight Visibility," Intl. Conf. on Parallel and Vector Processing, Tromso, Norway, June 6-10, 1988.
162. A. K. Somani and A. K. Gupta, "Rendezvous Type Protocol without Acknowledge Packets," in the Proc. of Phoenix Conf. on Computers and Communications Phoenix, March 1988, pp. 308-312.
163. A. K. Somani, "Distributed Diagnosis Algorithms for Large-Scale Regular Interconnected Structures," in the Proc. of 2nd International Conference on Computer and Applications, Beijing China, June 1987, pp. 661-666.
164. A. K. Somani and P. Narong, "Compact Neural Networks: Implementation in Regular Structures," in the Proc. of IEEE First Intl. Conf. on Neural Networks, San Diego, CA, June 1987, pp. III.191-III.199.
165. J. Ritcey, L. Atlas, A. K. Somani, D. Nguyen, F. Holt, and R. Marks II, "Signal Space Interpretation of Neural Networks," in the Proc. of IEEE International Symposium on Circuits and Systems, Philadelphia, May 1987.
166. A. K. Somani, V. K. Agarwal and D. Avis, "Single Fault Diagnosability Concept: System-Level Diagnosis as Applied to Large Scale Multiprocessor Systems," in the Proc. of IEEE International Symposium on Circuits and Systems, San Jose May 5-7, 1986, pp. 634-638.
167. A. K. Somani and V. K. Agarwal, "Concurrent Fault Diagnosis in Systolic Systems," in the Proc. IEEE Intl. Conf. on Computers Systems and Signal Processing, Bangalore, India, December 1984, pp. 717-721.
168. H. A. Elgindy and A. K. Somani, "Routing Tree for Systolic Architectures," in the Proc. of IEEE International Conference on Computers, Systems and Signal Processing, Bangalore, India, December 1984, pp. 1256-1259.
169. A. K. Somani and V. K. Agarwal, "System-Level Diagnosis in Systolic Systems," in the Proc. of IEEE International Conference on Computer Design-84, Portchester, New York, November 1984, pp. 445-450.

Abstract Refereed Conference Proceedings/Technical Reports:

1. A. K. Somani, "Potential Problems and Design Methodology for Fault Tolerant Distributed Computer Systems," ISED workshop, Seattle, WA, March 21-22, 1988, pp. 107-129.
2. A. K. Somani, "High Performance Highly Reliable Computer Architecture" at the summer meeting of IFIP Working Group 10.4, Zion, IL, June 1989.
3. D. A. Koehler and A. K. Somani, "Steed: A Testability Enhancement Expert Design System," abstract and poster presentation in the Proc. of International Test Conference, Washington D.C., September 1989.
4. A. K. Somani and S. B. Choi, "Extra Links Interconnection Networks for Packet Switching," abstract and poster presentation in the Proc. of PCCC-90, March 1990.
5. A. K. Somani, "Trustability: A Dependability Measure for Systems with Fault Detection and Reporting" at the summer meeting of IFIP Working Group 10.4 – Dependable Computing and Fault Tolerance, Langdale, UK, July 1990.
6. A. K. Somani, "Phased-Mission Reliability Analysis," in the Proc. of HARP Workshop, July 1990.
7. A. K. Somani, "Experience with HARP in Analyzing Reliability of Two Fail-op/Fail-op/Fail-safe Architectures," in the Proc. of HARP Workshop, July 1990.
8. A. K. Somani, "Proteus, A Reconfigurable Computer System," at the summer meeting of International Federation of Information Processing, Working Group 10.4, at Cape Cod, July 1992.

9. C. Wittenbrink, A. K. Somani, and C. Chen, "Cache Write Generation for High Performance Parallel Processing," poster paper with abstract in 19th International Symposium on Computer Architecture, Gold Coast, Qld., Australia, 1992, page 438. Also available as a tech report.
10. A. K. Somani, "Phased Mission Analysis Techniques," at NASA Langley Research Center workshop on tools and techniques, Hampton, VA, February 1993.
11. D. Fura and A. K. Somani, "An Interpreter Interface Language and Its Formal Embedding in Higher-Order-Logic," poster presentation and informal in Proc. for the 7th International Workshop on Higher Order Logic Theorem Proving and its Applications.
12. D. Fura and A. K. Somani, "Trustability: A Dependability Measure for Systems with Fault Detection and Reporting," July 1990.
13. A. K. Somani and P. Rostykus, "A Hyper-Cube Compact Neural Networks," poster presented INNS First Annual Meeting Boston, MA in September 1988.
14. A. K. Somani and P. Rostykus, "Evaluation of Hyper-Cube based Compact Neural Networks," poster presented at 2nd IEEE Second Intl. Conf. on Neural Networks, San Diego, CA, July 1988.
15. A. K. Somani and T. Sarnaik, "Methodology for Reliability Modeling for Fault Tolerant Computer Systems and its Applications," a report prepared for Boeing Aerospace Company as part of research contract, 1988. (Sponsored research, 60 pages)
16. A. K. Somani and M. Bagha, "A Design Methodology for Highly-Reliable Embedded Computing Systems," a report prepared for Boeing Electronics Company as part of research contract, 1987. (Sponsored research, 35 pages single spaced)
17. A. K. Somani, M. Lee and G. D'Souza, "Current Trends in Fault Tolerant Computing," A report prepared for Boeing Electronics Company as part of research contract, 1987. (Sponsored research, 100 pages single spaced)
18. A. K. Somani, "Sonar Display Systems," Proc. of CARE seminar on sonar system, Indian Institute of Technology, New Delhi, India, 1981, pp. V10-V36.

Patents: The following patents have been issued.

1. No. 4,910,733, "Rendezvous Network Protocol with Reduced Bandwidth and Processor Time," granted with Mr. A. Gupta of BNR Inc. for USA and Canada.
2. No. 5,524,212 "Multiprocessor system with write generate method for updating caches," June 1996.
3. No. 6,156,964 "Apparatus and Method of Displaying Music," Patent granted, December 2000.
4. No. 6,718,173 "Location Information recovery and Management for Mobile Networks," October 2004.
5. No. 7,113,795 "Location Information recovery and Management for Mobile Networks-II," September 2006.
6. No. 7,323,629 Real-Time Music Recognition and Display System, Jan. 2008.
7. No. 7,536,477 Access Mechanisms for Efficient Sharing in a Network, May 2009.