

# Curriculum Vitae of Arun K. Somani

## 1. Personal Data:

### **Arun K. Somani**

Senior Associate Dean, College of Engineering  
Anson Marston Distinguished Professor  
Philip and Virginia Sproul Professor  
Department of Electrical and Computer Engineering  
Iowa State University, Ames, IA, 50014  
Tel: (515) 294-0442, 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:

- Philip and Virginia Sproul Professor, Electrical and Computer Engineering (August 16, 2014 - Contd). Support innovative research and education program in computer engineering.
- Associate Dean for Research, College of Engineering, Iowa State University, (July 1, 2013 - Contd.).
- Chair, High Performance Computing Steering Committee, Iowa State University, (July 1, 2012 - June 30, 2015).
- Anson Marston Distinguished Professor, Iowa State University, Electrical and Computer engineering, (August 16, 2007 - Contd.).
- Chair, Electrical and Computer Engineering, (May 16, 2003 - Sept 30, 2010). Duties included managing the overall responsibilities of the department, a state budget of more than \$8.0 Million and a research budget of around \$10.0 Million per year, 50 faculty, 20 adjunct faculty and 20 staff members.
- Director, Information Infrastructure Institute (July 1, 2002 - June 30, 2015). Duties include building collaboration to find solutions for disparate problem using common methods.
- Jerry R. Junkins Endowed Chair Professor of Electrical and Computer Engineering (August 16, 2002 - August 15, 2014). To support development of 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 \$500K/year budget for computing/electronics laboratories.
- David C. Nicholas Professor of Electrical and Computer Engineering (1997 - 2002). Develop innovative research program in computer engineering areas.

### 3.b. Appointments Outside Iowa State:

- Distinguished Adjunct Professor, Birla Institute of Technology (BITS), Pilani, India, 2020-2025.
- Ram Rajindra Malhotra Professor, Indian Institute of Technology, Delhi, India., October 1, 2010 - May 15, 2011
- Honorary Distinguished Professor, National Taiwan University of Science & Technology, 2010-2015.
- Visiting Professor, Gujarat Technological University (GTU), Ahmedabad, India, 2011-2021.

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

### **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:**

- Member of IPSJ/IEEE-CS Joint Award Committee Member, 2019 and 2020.
- Fullbright Specialist Roster, On the Roaster from October 11, 2019-Apr 11, 2024.
- Distinguish Alumnus Award-2018, Birla Institute of Technology (BITS), Pilani, India.
- Distinguish Alumnus Award-2017, Prof. L.K.Maheshwari Foundation, Birla Institute of Technology (BITS), Pilani, India.
- Anson Marston Distinguished Professor, Iowa State University, 2007-Contd.
- First Recipient of Philip and Virginia Sproul Professorship, Iowa State, 2014-2019.
- First Recipient of Jerry R. Junkins Chair Professorship, Iowa State, 2002-2014.
- First Recipient of David C. Nicholas professorship, Iowa State, 1997-2002.
- Honorary Distinguished Professor, National Taiwan University of Science & Technology (Taiwan Tech), 2010-2015
- Distinguished Adjunct Professor, Birla Institute of Technology (BITS), Pilani, 2020-2025.
- Elected Fellow of IEEE for “contributions to theory and applications of computer networks,” 1999-2017.
- Life Fellow of IEEE, 2018-Ever.
- 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.

- Elected Fellow of AAAS for “distinguished contributions to the theory and practice of dependable computing and networking systems, including design, development, implementation, and building experimentation platforms,” 2012.
- Eminent Engineer, Tau Beta Pi, 2013- Contd.
- Fellow of Asia-Pacific Artificial Intelligence Association (AAIA).
- Department Leadership Award, Iowa State University, 2008.
- Mervin S. Coover Distinguished Service Award, Electrical and Computer Engineering, ISU, 2010.
- Warren B. Boast, Undergraduate Teaching Awards, Electrical and Computer Engineering, ISU, 2006.
- Best Teacher Award, Student Association, ISU, 1999.
- 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.
- IEEE Communication Society Distinguished Visitor (2009-2013).
- IEEE Distinguished Visitor (2000-2002).
- IEEE Distinguished Tutorial Speaker (2000-2002).
- Keynote and Banquet speaker at many conferences.
- 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 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 FPGA-based logic design boards for rapid prototyping and laboratory experimentation.
- 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. I supervised a senior design team to design and implement a PowerPC based system to be used in microcontroller-based system and application design laboratory.
- Computer Organization and Design/Computer Architecture and Structure. I have developed and taught various versions this course. I have revised it regularly to introduce new state-of-art tools and laboratory components in the course. Initially, it used a microprogramming based engine in the laboratory where student designed and implemented an instruction set architecture as part of the course. In the next reorganization, the laboratory included various microprogramming engines such as HP 3000 and Texas Instruments EVM-16 board (16-bit data path) to achieve the same goals. Subsequently, I introduced Verilog simulation engine in the same course taught as EE471 and CSE471) at the University of Washington (UW) and Cpre305 at ISU. In the follow on version courses uses both Verilog and FPGA based engines and system simulation tools.
- 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 two laboratory classes over a two semester period covered logic design, microcontroller applications and computer architecture, organization, and design in an integrated fashions. The 12-semester credits course sequence was taught for two academic years, 2004-05 and 2005-06. In each year a controlled group of 20 students (representative of student population) were as selected

and were taught the 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 adopted as a regular sequence in computer engineering curriculum at Iowa State University as CprE281/CprE381 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 at the University of Washington.
- 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. The 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. I also have 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 at US, we used this system for parallel and distributed 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. Research Area:**

- **A. Design of Fault-Tolerant and High Integrity Systems.** Microprocessor design, computer interconnection network, and performance and reliability analysis methodologies, techniques, and tools. We have developed architectural solutions for reliable and aggressive overclocking for power, performance, energy, and reliability tradeoffs and application of them in security application.
- **B. Parallel and High Performance Computing Systems.** Designed and implemented a large parallel computer system, *Proteus*, for machine vision applications. We have also developed application of high performance computing based on multi-core and GPU and other accelerator-based machines for a variety of applications.
- **C. Reconfigurable/Balance Computing.** High-performance adaptive balanced computing systems deploying reconfigurable and memory lookup-based computing techniques.
- **D. Wavelength Division Multiplexing-based Optical Networking.** We have addressed issues in architecture and algorithms for design, routing, role of wavelength conversion, and dependability issues in WDM-based local and wide-area optical networks.
- **E. Wireless and Sensor Applications.** We have also performed research in the area of medium access protocols, robust load-balanced location management and protocol issues, fairness in channel utilization, and dependability in ad-hoc and structured wireless and mobile computing.
- **F. Image/Vision Processing and Applications.** We have developed visual sensors and development of framework for meta image navigation augmenters (MINA) for GPS denied environment and application of this along with other sensors for real-time navigation and asset monitoring.

- **G. Convolution Neural Network Design: Hardware Perspective.** We are focusing on automated hardware-aware architectural design process of Deep Neural Networks (DNNs). The field of Convolutional Neural Network (CNN) algorithm design. Several hardware platforms, general and special purpose, are considered and compared with the goal of Hardware-Aware Neural Architecture Search (HW-NAS) process to be automated.

**6.b. Contributions:** Have made the following significant research contributions.

- **A1. System-Level Diagnosis.** 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. We 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. We have also developed distributed fault diagnosis algorithms for multi-processor systems that exploit the regularity and symmetry of interconnection topology and allow fault sets 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.
- **A2. Fault Tolerant Computer System.** 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.
- **A3. Reliability Analysis Tools and Techniques.** Developed techniques and tools to analyze reliability of complex systems that operate in multiple phases with different requirements and follow complex maintenance schedules. Examples include commercial and military aircraft systems, and NASAs shuttle systems. The tools, EHARP (Enhanced Hybrid Automated Reliability Predictor) and HIMAP (Hierarchical Modelling and Analysis Package) were developed for the Boeing Company, who uses them regularly. 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
- **A4. Managing Soft Faults.** 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. Also developed a novel concept of reconfigurable caches/functional units integrated in micro architecture to achieve a balance processor and memory bandwidths.
- **A5. Performance and Reliability of Processor Systems.** 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.
- **B1. VLSI dictionary machine.** 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 using a simpler control structure that is easy to implementable.
- **B2. Proteus Multi-Computer System.** 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.

- **B3. Beyond Arithmetic Carry Chain:** Logic Chain for 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.
- **B4. Data Shaping.** GPS is a critical sensor for Unmanned Aircraft Systems (UASs) due to its accuracy, global coverage and small hardware footprint, but is subject to denial due to signal blockage or RF interference. When GPS is unavailable, position, velocity and attitude (PVA) performance from other inertial and air data sensors is not sufficient, especially for small UASs. We have developed a novel, automated approach called MINA (Meta Image Navigation Augmenters), which is a synergy of machine-vision and machine-learning algorithms for map aided navigation. MINA utilizes publicly available collection of discrete landmarks and open source geo-referenced vector map data, such as OpenStreetMap, in conjunction with real-time optical imagery from an on-board, monocular camera to augment the UAV navigation computer when GPS is not available, as well as generate a vector and EXIF based 3D aeronautical chart in real time. The MINA approach has been experimentally validated with both actual UAV flight data, and flight simulation data.
- **B5. Scalability and Efficiency of Data Management in All-Pairs Interactions.** We address the memory bottleneck in a class of application where a large amount of data is involved. The data consists of data elements, which need to interact with each other as in a cross product. Two choices are to store data in a single nodes memory and compute the cross product. Alternately data can be distributed among multiple computing nodes and be moved as needed. The latter however creates a large data movement affecting the performance of the algorithm. Our method allows distributing data efficiently initially and then remove the need for any further communication of data among nodes. We accomplish by it using cyclic quorum theory The same basic scheme can be deployed in establishing communication paths between all pairs in a communication network by embedding multiple rings in the network topology, one ring for each quorum set. This then provides a path from any node to any other nodes without any further routing algorithm. The scheme has been extended to provide redundant paths between any pair of nodes for fault tolerant routing algorithm.
- **C1. Network Topologies.** Interconnection topologies play important role in development of parallel and distributed multi-computer systems. We have 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.
- **C2. Reconfigurable Architectures.** Have investigated developing reconfigurable architectures that are based on FPGA-like memory lookup-based computing techniques. In particular, 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.
- **C3. Peer-to-Peer (P2P) Networks.** These 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 have developed CompuP2P, which is architecture for distributed computation that facilitates trading of computing power using an incentive driven economic model.

- **D1. Fiber-Optics Based Optical Networks.** Have made significant research contribution in design and operation of fiber optics based optical networks. The most prominent component of this research in this area is characterization of role of wavelength converters in optical WDM (wavelength division multiplexing)-based network and algorithms for placement of convertors. Follow on work focused on development of alternate architectures that employ no wavelength conversion, but use multiple fiber, with fewer wavelengths on each fiber (a very practical approach and a very cost-effective solution)
- **D2. Traffic Grooming.** We have developed several mechanisms and traffic grooming algorithms; traffic grooming architectures; and algorithms for resource allocation for efficient traffic grooming.
- **D3. Fault and Attack Management in WDM networks.** We have developed dependable routing and connection management methods; investigated techniques and methods to detect and diagnose attacks in WDM-based fiber optic networks; and created simulation environment to analyze the effectiveness of the techniques. Several effective several effective full and partial survivability techniques using resource sharing approaches have been developed.
- **E1. Location Management.** Developed an efficient fault tolerant distributed database system to manage location information of mobile devices. This scheme distribute the location update and search workload on multiple distributed database systems to optimize the search and update time and and load balance the workload of involved servers.
- **E2. Sensors-Assisted 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 common occurrence. We have developed a theoretical and experimental program to carry out inspection and fault detection technology for power grid and other assets monitoring using wireless sensor network.
- **E3. Assets Monitoring.** Integrated miniature air vehicles (MAVs) for persistent intelligence, reconnaissance, maintenance and surveillance for obscured or logistically challenging assets in non-urban environments have been developed. The system converges towards an error-free state with self stabilization, and has an ability to fall back to a safe mode.
- **F1. GPS-Denied Navigation and Augmentation.** Future of intelligence, surveillance and reconnaissance missions involve GPS-denied environments. GPS spoofing and jamming are immediate threats. Our research focus on vision Guided Navigation of Unmanned Air Vehicles.
- **F2. Image-Based Navigation.** This research finds use of GPS denied environments and vision guidance in other applications on diverse platforms. One goal is to develop a self-calibrating image-navigation system. In this process we have develop methods to establish and verify current location based on man made and natural landmarks characteristics from available data bases and available imagery from camera systems.
- **F3. Characterization of Mountain Signature.** We extend the GPS-denied missions in mountain areas, with no assumption of human-made geographic objects. We leverage the analogy between mountain drainage patterns, human arteriogram, and human fingerprints, to match local drainage patterns to parallax occlusion maps of geo-registered radar returns.

## **6.b. Student Research Supervision:**

### **6.b.1. Post-Doctoral Fellows and Visitors:**

1. Dr. Ofer Peleg, Post Doctoral Fellow, Israel, (1994-95)
2. Dr. Siva Ram Murthy, Visiting Faculty, IIT India (1996-97)

3. Dr. G. Mohan, Post Doctoral Fellow, IIT India (1999-2000)
4. Dr. Ashwin Gumaste, Visiting Faculty, IIT Bombay, India (2007-2008)
5. Dr. Z. Le, Visiting Faculty, China, (2008)
6. Koray Celik (Spring 2013- Spring 2015)
7. Mayank Mishra (Nov 2015-June 2017)

### **6.b.2. 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 Taejon 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. Prem Kumar Ramesh (Spring 2011) “Aggressive and Reliable High-Performance Architectures - Techniques for Thermal Control, Energy Efficiency, and Performance Augmentation.” Committee Members: Akhilesh Tyagi, David Fernandez-Baca, Zhao Zhang, and Joseph Zambreno.
28. Jinxu Ding (Fall 2012) “Policy Driven Capacity Expansion Planning of Energy Infrastructure: Modeling and Solutions using High Performance Computing.” Committee Members: Nicola Elia, James McCalley, Peter Sherman, and Zhao Zhang. Received Research Excellence Award.

29. Prasad Avirneni (Fall 2012) “RAKSHA:Reliable and Aggressive frameworK for System design using High-integrity Approaches.” Committee Members Akhilesh Tyagi, Joseph Zambreno, Phillip Jones, David Fernandez-Baca, and Zhao Zhang. Received Research Excellence Award.
30. Lizandro Damian (Fall 2012) “Parallelization and checkpointing of GPU applications through program transformationParalleli.” Committee Members: Brett Bode, Akhilesh Tyagi, Zhao Zhang, Shashi Gadia.
31. Koray Celik (Fall 2012) “Vision Guided Navigation.” Committee Members: Steve Holland, Namrata Vaswani, Akhilesh Tyagi, Peter Sherman, and Zhao Zhang. Received Research Excellence Award.
32. Pavan Gorti (Spring 2014) “Application aware performance, power consumption, and reliability trade-off.” Committee Members: Akhilesh Tyagi, Joseph Zambreno, Philip Jones, and David Fernandez Baca.
33. David Lastine (Summer 2014) “Efficient communication using multiple cycles and multiple channels.” Committee Members: James Cochran, Ahmed El-sayed Kamal, Mani Mina, Robert J Weber.
34. Cory Kleinheksel (Spring 2016), “Efficient Computation and Communication Management for All-Pairs Interactions.” Committee Members: Shashi Gadia, Manimaran Govindarasu, Suresh Kothari, and Srikanta Tirthapura.
35. Teng Wang (Summer 2016) “Augmented navigation in GPS denied terrain environments using synthetic vision.” Committee Members: Joseph Zambreno, Nicola Elia, Namrata Vaswani, and Peter Sherman. Received Research Excellence Award.
36. Parijat Shukla (Fall 2017) “Efficient Similarity Computation for Semi-structured Data using Data Shaping.” Committee Members: Akhilesh Tyagi, Joseph Zambreno, Zhao Zhang, and Siggı Olafson.
37. Pratik Mishra (Spring 2018) “Host managed storage solutions for Big Data,” Committee Members: Akhilesh Tyagi, Anuj Sharma, Chinmay Hegde, and Siggı Olafson.
38. Piyush Lakhawat (Fall 2018) “Knowledge discovery techniques for Transactional data model,” Committee Members: Jack H. Lutz, Joseph Zambreno, Phillip H. Jones, Yong Guan, Zhengdao Wang.
39. Ravikiran Yeleswarapu (Spring 2020), “Addressing multi-bit errors in DRAM/memory subsystem,” Committee Members: Zhao Zhang, Akhilesh Tyagi, Phillip H. Jones, and Sigurdur Olafsson.
40. Krishna Teja Chitty-Venkata, started in Fall 2017 (passed Qualifying Examination).
41. Yiming Bian, started in Spring 2020, (will take Qualifying Examination in Fall 2020).

### **6.b.3. 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) "Hierarchical Analysis of Fault Trees with Dependencies, Using Decomposition."
45. T. Sakaguchi (Spr 97) "Hierarchical Stochastic Reward Net."
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 Petrinet 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. Sonal Pandey (Fall 2001), "Mechanisms and protocols for intermediate processing at routers in the Internet."
57. Dazhi Zhang (Sum 2002), "Fairness and Fairness, An Interpretation and Application in Ad-Hoc Wireless Networks."
58. Aaron Cordes (Sum 2002), "Parallelization of Image Processing Applications."
59. Nathan Vanderhorn (Fall 2002), "RDF network: A high-speed option for Metropolitan Area Networks."
60. Wheng-Sheng He (Fall 2002), "Capacity Optimization for Surviving Double-Link Failures in Mesh-Restorable Optical Networks."
61. Mike Frederick (Fall 2002), "A Single FAult Recovery Strategy for Optical Networks Using Subgraph Routing."
62. Adeel Israr (Fall 2002), "CBCA: Balanced Cache Checkpointing for Superscalar Processors."
63. Rakesh Raghavan (Spring 2003), ICEI TCP: Implt Congestion and Explicit Interference Detection in TCP."
64. Jinran Chen (Spring 2003), "Fairness in Wireless Ad-Hoc Network in the Presence of Channel Errors."
65. Nitin Jose (Sum 2003), "Connection rerouting for network reconfiguration."
66. Yana Ong (Sum 2005), "Iowa State Optical Simulator (ISTOS): Design, Architectures and Features."
67. V. Sekhri (Sum 2005), "CompuP2P: A Light-Weight Architecture for Internet Computing."

68. G. Subramaniam (Spring 2006), “Control Caching: A fault-tolerant architecture for SEU mitigation in microprocessor control logic.”
69. M. Bezdek (Sum 2006), “Utilizing timing error detection and recovery to dynamically improve superscalar processor performance.”
70. D. Lastine (Spring 2007), “An examination of single link failure in an optical network with full grooming.”
71. Kamna Jain (Fall 2007), “D-RDF: Dynamic Resource Description Framework.”
72. Zachary Schmid (Sum 2009) started with thesis graduated with M. Eng.
73. Kritanjali Balakrishanan (Sum 2009) started with thesis graduated with M. Eng.
74. Nishant Reddy (Sum 2009) “Network coding in Wireless Networks.”
75. Somya Gupta (Fall 2009) started with thesis graduated with M. Eng.
76. Harini Sundararaman (Fall 2010) started with thesis graduated with M. Eng.
77. Mani Ganesh (Fall 2010), “Complex Event Processing Models.”
78. Suresh Shankaran (Summer 2011) “Impairment Aware Cycle Based Routing Algorithm (IACBRA).”
79. Ashish Daga (Fall 2013) “Schedulability Modeling & Verification & Using Model Checking in Uppaal.”
80. Joy Shukla (Fall 2014), “Hybrid Drive Design: An Economics-Workload Based Approach.”
81. Haoyuan Lin (Summer 2015), “Foreign object detection (FOD) using multi-class classifier with single camera vs. distance map with stereo configuration.”
82. Karthik Subramanya (Summer 2016), “Predicting Customer attrition for an e-retailer through the power of Big Data.”
83. Rashmi Girmala (Spring 2017), “LowLEAC: Low Leakage Energy Architecture for Caches.”
84. Venkata-Kasi Yeleswarapu, (Summer 2017), “Efficient Parallel All-Pairs Computation Framework: using Computation - Communication Overlap.”
85. Sai-Abhyudhayreddy Ravula, (Fall 2017), started with thesis graduated with M. Eng.
86. Yiming Bian, (Spring 2020), “A Systematic Approach to All Cyclic Quorum Sets Computation.”
87. Md. Jawad Mashrur Rahman (Fall 2020), “Utilizing two stage scrubbing to handle single-fault multi-error cases in DRAM Systems.”

**6.b.4. Undergraduate Students Supervision:** Regularly supervise a group of 4-6 students’ project every year as senior design or research experience for undergraduate.

**6.c. Research Proposals or Grants:**

**6.c.1. Current and Pending Sponsored Research:**

1. NSF, “NSF: MRI: Acquisition of a Shared High-Performance Computing System for Cyber-Enabled System Design,” 10/1/20-9/30/2023, Total funding \$600,000(PI, co-PIs B. Ganapathysubramanian, A. Sharma, C. Lawrence-Dill, S. Ryan, 35% effort). Being funded at \$600,000 with a match of \$257,200.
2. Virginia and Philip Sproul Professor, ISU, Approximately \$40,000/year from ECPE department, 2014-2024.

**6.c.2. Completed Sponsored Research:**

1. Iowa Economic Development Agency, “Enabling COVID-19 research activities via HPC infrastructure,” 11/1/20-3/31/2021, Total funding \$150,000 (PI, co-PI B. Ganapathysubramanian).

2. NSF, "CC\* Integration: End-to-End Software-Defined Cyberinfrastructure for Smart Agriculture and Transportation," 10/1/18-9/30/2021, Total funding \$999,919(co-PI with PI Zhang and co-PIs Kamal, Sharma, Schnable, 15% effort).
3. NSF, "SHF: Small: Enhancing Memory System Dependability by Integrity Checking," 7/1/16-6/31/21, Total funding \$438,500, (lead PI with Drs. Zhang 50% effort).
4. NSF, "MRI: Acquisition of a HPC System: Computing for Sustainability," 8/16/17-8/15/19, Total funding \$678,216 from the NSF, with a matching of \$290,663 from ISU (lead PI, co-PIs Dr. A. Passalacqua, B. Ganapathysubramanian, C. Lawrence-Dill, and H. Rajan, 40% effort).
5. NSF, "MRI: Acquisition of a HPC System for Data-Driven Discovery in Science and Engineering," 8/16/12-8/15/16, Total funding \$1,841,346, with a matching of \$789,149 from ISU (lead PI with Drs. Aluru, Gordon, Fox, and Takle, 40% effort).
6. NSF, "II-NEW: Distributed Computing Laboratory for Large Scale System Modeling and Analysis," 8/16/12-8/15/16, Total funding \$350,000, (Lead PI with Drs. J. McCalley and S. Tirthapura, 60% effort).
7. Vermeer Corporation, "Foreign Object Detection," 5/16/13-6/30/15, Total funding \$300,000, (Co-PI with Dr. Raj Aggrawal, 50.00% effort).
8. Jerry R. Junkins Chair, ISU, Approximately \$75,000/year from ECPE department, 2002-2014.
9. NSF, "EFRI-RESIN: 21st Century National Energy and Transportation Infrastructures: Balancing Sustainability, Costs, and Resiliency (NETSCORE-21)," 9/16/08-9/15/14, Total funding \$1,983,226, (Co-PI with Drs. J. McCalley (lead PI), K. Gkritza, L. Wang, and D. Aliprantis, 16.67% effort).
10. NSF, "CSR-DMSS, SM: Design and Evaluation of a Scalable Meta-Event Dissemination System," 9/1/08-9/1/13, Total funding \$432,000, (Co-PI with Dr. S. Tirthapura, 50% effort).
11. Rockwell Collins, "Refined Map-Aided Navigation for Aerial Platforms," 11/21/12-9/30/13, Total funding \$75,000.
12. Rockwell Collins, "Aerial Image Navigation using Geo-Referenced Landmarks," 1/1/11-10/31/12, Total funding \$50,000.
13. Rockwell Collins, "On-the-fly Lens Calibration for Image Navigation and Map-aided Navigation," 10/1/10-9/30/11, Total funding \$100,000.
14. Dept. of Education, "Graduate Assistantship in the Area of National Needs (GAANN)," 8/16/06-8/15/11, Total funding \$520,000.
15. 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.
16. NSF, "NeTS-NBD: Survivable Multipoint Traffic Grooming in Optical Networks," 8/1/06-8/1/11, Total funding \$318,000, (Co-PI with Dr A. Kamal).
17. 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).
18. 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). Received additional funding for REU \$16,000.
19. Rockwell Collins, "Real-Time Image Navigation and Mapping," 10/1/09-9/30/10, Total funding \$100,000.
20. 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.

21. 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.
22. Rockwell Collins, "Enhancement of Microcode Development Tools)," 8/1/07-12/31/08, Total funding \$39,000.
23. Rockwell Collins, "3-D Localization and Optical sensor)," 8/1/07-12/31/08, Total funding \$49,000.
24. 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.
25. 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).
26. 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.
27. 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.
28. 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.
29. Lockheed Martin Company, "Developing an Innovative Software Engineering Education Program," (Co-PI with Dr. S. Kothari), 02/01/02-01/31/07, \$165,000.
30. ITN Corporation, "Subsystem Fault Detection in Sensor Networks," Subcontract from an NSF SBIR grant, (sole PI) , 07/01/05-07/12/05, \$14,000.
31. Lockheed Martin Company, "Optical Networking," \$50,000, 1/1/03-12/31/05. (sole PI)
32. 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).
33. 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).
34. NSF, "Adaptive Balanced Computing Architectures (With Dr. A. Tyagi)," 8/16/99 - 8/15/03, \$350,000.
35. NSF, "REU Program," 8/16/99-8/15/03, \$60,000 (6 grants of \$10,000 each).
36. 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.
37. Nicholas Professorship, ISU, \$35,000/year + \$40,000/year from ECPE department, 1997-2202.
38. 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.
39. Craver Trust, "Reliability of Future Processors," 7/1/00 - 6/30/01, \$10,750.
40. NSF, "Extent and Effects of Error Propagation and Recovery Mechanisms in Cache Memory Systems (PI)," 9/16/96 - 8/15/00, \$180,000.
41. NSF, "Issues in Design of Lightwave Networks with Sparse Wavelength Conversion (Co-PI M. Azizoglu)," 9/16/96 - 8/15/00, \$338,395.
42. Innovative Medical Devices, "Music Artists' Assistant Design of a Music Display/Follow System," 6/1/99 - 5/31/00, \$113,000.

43. Craver Trust, "ABC:Adaptive Balanced Computing," 7/1/98-6/30/99, \$25,000 (Co-PI Dr. A. Tyagi).
44. 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).
45. Allied Signal, "Analysis Techniques for Integrated Avionics Systems (PI)," 6/16/97 - 9/15/98, \$95,000.
46. NSF, "Error Detection and Recovery in High Performance Fault Tolerant Processor Systems Employing Caches (PI)," 7/1/93 - 12/31/96, \$159,332.
47. Royalty Research Funds, UW, "Management of Remote Connectionless Multimedia Service through ATM Network (PI)," March 16, 1995 - June 15, 1996, \$20,700.
48. NSF, "Congestion Control and Fault Tolerance in Broadband-ISDN computing (PI with Professor James S. Meditch)," 8/16/91 - 7/15/95, \$461,620.
49. Boeing Advance Systems, "Cash gift," 1990 - 1994, \$10,000.
50. NASA Headquarters, "A study of Parallel Architectures and Algorithms for Volume Rendering," 7/1/91 - 6/30/93, \$44,000.
51. WTC, "Design of high integrity systems (PI)," 7/1/91 - 6/30/93, \$50,000.
52. 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.
53. Novell Inc., "Fault management in local area network (PI)," 2/1/91 - 9/15/91, \$20,365 (Cash), \$19,380 (Software and Hardware gifts).
54. WTC, "Design of high integrity systems (PI with Mani Soma), 7/1/88-6/30/91, \$135,400.
55. Intel Corp., "Processor pipeline architecture using i860 (PI)," 7/1/90 - 6/30/91, \$35,750 (H/W).
56. Boeing Aerospace Co., "Reliability analysis and modeling methodology (PI)," 3/16/88 - 9/30/90, \$80,320.
57. Boeing Electronics Co., "Methodology and design of an architecture for fault tolerant embedded systems (PI)," 11/1/86 - 9/30/89, \$113,642.
58. Boeing Aerospace Co., "Architectural Analysis of a fault tolerant architecture for embedded systems (PI)," 1/16/88 - 9/30/89, \$40,947.
59. Texas Instruments, "Microprogramming laboratory development (PI)," 9/1/88 - 6/30/89, \$18,478 (H/W).
60. Boeing Electronics Co., "Analysis and application of neural networks," Co-investigator with PIs: Robert Marks and Les Atlas, \$75,000 (1986), \$50,000 (1987).
61. University of Washington, "Equipment grants," \$10,000 (Graduate School), \$10,000 (College of Engineering), \$10,000 (Department of Electrical Engineering).
62. 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:**

- Editor of Peer J, an open access journal, 2015-Contd.
- Member of IPSJ/IEEE-CS Joint Award Committee Member, 2019 and 2020.
- Fellow AAAS, elected for "distinguished contributions to the theory and practice of dependable computing and networking systems, including design, development, implementation, and building experimentation platforms," 2012.



- Fellow IEEE, elected for “contributions to theory and applications of computer networks,” 1999.
- ACM Distinguished Engineer, 2006. ACM Member since 1986.
- Member (Fellow) IEEE Computer Society, 1986 (1999)-Contd.
- Member (Fellow) IEEE Communication Society, 1995 (1999)-Contd.
- IEEE Communication Society Distinguished Lecturer 2009-13.
- IEEE Distinguished Speaker 2000-02.
- IEEE Distinguished Tutorial Speaker 2000-02.
- ABET Evaluator, 2003-Contd.
- Eminent Engineer, Tau Beta Phi, 2013- Contd.
- Member Golden Key International Honor Society.
- Steering Committee, Optical Network Technical Group, SPIE.
- Editor Electronic New Letter, IEEE Technical Committee 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, 2012-2016.
- Associate Editor of IEEE/ACM Transactions on Networking, 2003-2009.
- Associate Editor of Elsevier Computer Networks Journal, 2003-2016.
- Associate Editor of Elsevier Optical Switching and Networking (OSN), 2004-Contd.
- Member Editorial Advisory Board, Journal of Pervasive Computing and Communications, 2005-2015.
- Editorial Board, International Scholarly Research Network (ISRN) Communications and Networking Journal, Hindawi Publishing Corporation, 2010-2014.

#### **7.b. Organization Activities of International Conferences and Forums:**

- Conference Chair, ICETCE-2022, 5th International Conference on Emerging Technologies in Computer Engineering, organized by Swami Keshvanand Institute of Technology, Jaipur, India February 2022.
- Conference Chair, ICETCE-2021, 4th International Conference on Emerging Technologies in Computer Engineering: Data Science and Blockchain Technology, organized by Swami Keshvanand Institute of Technology, Jaipur, India February 2021.
- General Chair, SSICC-2021, Third International Conference on Smart IOT Systems: Innovations in Computing, organized by Manial University, Jaipur, India January 2021.
- General Chair, SSICC-2019, Second International Conference on Smart IOT Systems: Innovations in Computing, organized by Manial University, Jaipur, India January 2021.
- General Chair, SSICC-2017, First International Conference on Smart Systems, Innovation, and Computing Conference, organized by Manial University, Jaipur, India April 2017.
- Technical Program Chair, IEEE/ICC 2014, Optical Networks and Systems Symposium.

- General Chair, IEEE EIT 2008, held at Ames, IA, May 2008.
- General Chair, Broadnets 2005, held at Boston MA, October 2005.
- General Chair, IEEE FTCS-27, held in Seattle WA, June 1997.
- Technical Program Co-Chair, RNDM 2016.
- Technical Program Chair, IEEE/SPIE OPTICOMM 2003.
- Technical Program Chair, IEEE ICCCN 1999.
- Technical Program Chair, Advances in Computing (India) December 1997.
- Technical Program Chair, IEEE Workshop on Mixed Signal Testing, 1991.
- Tutorial Chair, IEEE FTCS, 1999.
- Tutorial Chair, IEEE ICC, 1995.
- Track Chair: Networking at IEEE PCCC, Phoenix, AZ, March 1992, 1994.
- Session Chair at several conferences.
- Program Committee Member: Fault tolerant computing symposium, 1991, 1994, 1996, 1997, 1998, 1999, Dependable Systems and Networks, 2003, 2004, 2014, 2015, 2016, 2017, 2018, Performance and Dependability Symposium, 2004-2013 (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 - 2013 (every year), IEEE ICCCN, 1995, 1998 to 2009 (every year), IEEE INFOCOM, 1996, 1997, 1999, 2001, 2003, 2006-2017 (every year), IEEE ICC 2004-2018 (every Year), IEEE Globecom 2005-2017 (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, 2015, 2016, European Dependable Computing Conference, 2006, DISC 2007, Broadnets 2006-2009, IEEE LAN 2008, IEEE RNDM 2009-2018(every year), IEEE ANTS 2012-2018 (every year), IPCC 2012-2017 (every year), several others in India in 2016, 2017, and 2018.
- 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.
  - Grooming in Switched Multilayer Transport Networks, ONDM 2003, Budapest, Hungary, 2003.
  - Optical Networking Research: Decline or Resurgence? - Broadnets 2006, San Jose, 2006.

### 7.c. Referee:

- **Funding Agencies:** National Science Foundation, 1990-2016; Qatar National Research Fund (QNRF), Qatar Foundation, 2008, 2009; HongKong Research Foundation, 2008; Natural Sciences and Engineering Research Council of Canada (NSERC), 2008-11, Korea-U.S. Science Cooperation Center, 2011-13.
- **Journals:** ACM Computing Surveys, IEEE Computers magazine,, IEEE Computer Network magazine, IEEE Software magazine, 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, Theory and Applications, Progress in Neural Network, Journal of Algorithms, Journal of Computer Vision, Graphics and Image Processing, Journal of Parallel Computing, IEEE Proceeding.

- **Conferences:** 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.

#### **7.d. University Committees:**

- ISU: Advisory Board Member, Iowa Energy Center, 2013-2016.
- ISU: Advisory Board Member, SP@ISU, 2013-Contd.
- ISU: Associate Dean for Graduate Education Committee, 2013-Contd.
- ISU: Graduate Council, Graduate College, 2012-2015.
- ISU: Chair of HPC@ISU, a university wide Steering committee to manage HPC, 2011-2015.
- ISU: Member of Vice President for Research Search Committee, 2013.
- ISU: Member of In-Trans Director Search Committee, 2011-12, 2012-13.
- ISU: Member of Chair's cabinet, 2005-2010.
- ISU: Member of Budget Model Review and Implementation Committee, 2006-2007.
- ISU: Member of Chief Information Officer Search Committee, 2003.
- ISU: Member of Computer Science Chair Search Committee, 2001.
- ISU: Information Science and Technology Task Force, 2000.
- ISU: Member of Committee on Academic Computing (CAC) 1999, 2000.
- UW: Special Committee on Minority Faculty Affairs (1989-93), Chair (1992-93).
- UW: Member of Royalty Research Fund Proposal Evaluation Committee (1993-95).

#### **7.e. College Committees:**

- ISU: COE: Associate Dean for Research and Graduate Education, 2013-Contd.
- ISU: COE: Chair of Search Committee to search for President High Impact Hires in Big Data area in CoE, 2013-14, 2014-15.
- ISU: COE: Chair of Search Committee to search for President High Impact Hires in Translational Health area in COE, 2013-14, 2014-15.
- ISU: Chair, Aerospace Department Chair Search Committee, 2009-2010. Search was successful.
- ISU: Member, College of Engineering, Engineering Fee Task Force (EFTF) 1998-2003.
- ISU: Member, Research Grant Evaluation Committee 1998-2001. Review of internal research proposals.

- ISU: Chair, EFTF Allocation Review Committee 1998-1999. Developed a simplified policy for proportional allocation of EFTF resources.
- UW: Member, ENGR Course Development Committee (1991-93).
- UW: Member, Student Affairs Committee (1993-94, 1995-1996).
- UW: Alternate Member, College Promotion and Tenure Committee, 1996-97)

#### **7.f. ISU Departmental Committees:**

- ISU: Chair of ECpE Promotion and Tenure Committee, 2012-2013.
- ISU: Member of ECpE Promotion and Tenure Committee, 2011-2012.
- ISU: Member of ECpE Research Committee, 2011-2013.
- ISU: Chair, ECpE, May 16-2003 - Sept 30, 2010.
- ISU: Director of Information Infrastructure Institute, 2002-Contd.
- ISU: Associate Chair for resources 2000-2003.
- ISU: Chair, Promotion and Tenure Committee 2000-02.
- ISU: Chair, Computer Usage Committee 1998-2003.
- ISU: Member, Computer Usage Committee 1997-98.
- ISU: Member, Governance Document Revision Committee 1998-99.
- ISU: Member, Promotion and Tenure Committee 1998-03.
- ISU: Member, Faculty Search Committee 1997-99, 2002-2003.
- UW: Member, Support Services Committee (1985-87).
- UW: Member, Admission Appeals Committee (1988-89).
- UW: Member, EE Faculty Search Committee (1988-89, 1990-91, 1993-94).
- UW: Chair EE Faculty Search Committee (1995-96).
- UW: Member, CSE Admissions Committee (1990-91, 1991-92).
- UW: Member, CSE Cheating Committee (1990-94, 1995-96).
- UW: Member, EE Graduate Study Committee (1990-91).
- UW: Member, EE Graduate Admissions Committee (1990-91).
- UW: Member, CSE Undergraduate Computer Architecture Course Committee (1990-91, 1991-92).
- UW: Member, EE Advisory Committee (1991-92, 1992-93).
- UW: Group Chair, Electronics and Computers Group in EE (1991-92).
- UW: Member, EE Computer Resources Committee (1991-92, 1992-93, 1993-94, 1995-96).
- UW: Member, CSE Curriculum Committee (1992-93).
- UW: In-charge, CSE 519 seminar series (1993-94).
- UW: Member, CSE/EE Building Committee (1995-1996).
- UW: Member, EE Promotion and Tenure Review Committee (1995-97).
- UW: Chair, CSE Graduate Student Review of Progress Committee (1995-96).

- UW: Member, CSE Qualifying Evaluation Committee (1996-97).
- UW: Group Chair for EE Digital Systems (1996-97).

### **7.g. Outside University:**

- Executive Committee Member (2014-2019) for Digital Manufacturing and Design Innovation Institute representing Iowa State University as Tier I partner. DMDII was funded at \$70M by federal government with a promised \$140M industrial and partner cost share as part of NNMI - National Network for Manufacturing Innovation program.
- Executive Committee Member (2018-22) for REMADE Institute representing Iowa State University as Tier I partner. REMADE has been funded at \$70M by federal government with a promised \$140M industrial and partner cost share as part of NNMI - National Network for Manufacturing Innovation program.
- Member of Board of Trustees, Hindu Temple and Cultural Center (HTCC), 1991-997.
- 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)1999-2014.
- Treasurer, HTCC-CI, 1999-2005.
- Vice President and Member of Executive Board of Indian Cultural Association, Ames, Iowa, 2006-2007.
- Member of Executive Board of Indian Cultural Association, Ames, Iowa, 2017-2018.

### **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, Granoble, France, March 2001.
- “Using Spare Capacity for Fault Detection in Multiprocessor Systems,” at
  - (i) University of Arizona, Tucson, AZ, April 1994; (ii) IIT, New Delhi, Jan. 1995.
- “Performance for Nothing,” at
  - (i) The University of Newcastle, Australia, March 1995;
  - (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
  - (i) University of Washington, Dept. of Computer Science Lecture Series., January 1997;
  - (ii) Iowa State University, Computer Science Lecture Series., October 1997;
  - (iii) Massachusetts Institute of Technology, Cambridge, MA, October 1999;
  - (iv) Texas A & M, College Station, TX, April 26, 2000.
- “Cache Fault Tolerance,” at Iowa State University, February 1997.
- “Issues in Optical Interconnection of LANs,” at
  - (i) Departmental seminar at Suny Buffalo, November 1997;
  - (ii) Departmental seminar at the George Washington University, November 1997;
  - (iii) Departmental seminar at University of Iowa, Iowa City, December 1997;
  - (iv) Aerospace Corporation, Los Angeles, February 1998;
  - (v) National Plasma Physics Institute, Ahmadabad, India, June 1999;
  - (vi) 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,” at
  - (i) Ohio State University, April 1999;
  - (ii) 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
  - (i) National Plasma Physics Institute, Ahmadabad, India, January 2001;
  - (ii) 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,”
  - (i) Keynote Speech at Beyond SONET/SDH workshop, IP Over WDM Workshop Paris, April 2001;
  - (ii) Indian Institute of Bombay, December 7, 2001.
- “Monitor Placement Algorithm,” High-Speed Networking Workshop, April 2001.
- “Survivable Traffic Grooming Networks,”
  - (i) Keynote Speech at Broadband Fiber Optical Technology Conference, North Maharashtra University, Jalgaon, India, December 2, 2001;
  - (ii) Department of Electrical and Computer Engineering, University of Houston, March 15, 2002;
  - (iii) 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 in Optical Networking,”
  - (i) Key note Speech at ONDM-2005, February 7, 2005;
  - (ii) Distinguished Lecture, University of Texas, Dallas, January 27, 2006.
- “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.
- 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,”
  - (i) Keynote Speech at Broadnets 2007, Raleigh/Durham, NC, September 11, 2007;
  - (ii) 12th 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.
- “Efficient Protection and Grooming Architectures for Future Optical Networks,”
  - (i) Invited Talk, Duke University, Raleigh/Durham, NC, September 2007;
  - (ii) Tutorial talk at Asia Communication and Photonics Conference (APC) 2009, Shanghai, China;
  - (iii) IEEE Comm. Society Distinguished Lecture at National Singapore University (NSU), Singapore;
  - (iv) IEEE Comm. Society Distinguished Lecture at Nanyang Technology University(NTU), Singapore, March 9, 2010;
  - (v) IEEE Comm. Society Distinguished Lecture at Indian Institute of Technology, Delhi, November 2010;

- (vi) IEEE Comm. Society Distinguished Lecture at XiDan University, Xian, China, June 13, 2011;
  - (vii) IEEE Comm. Society Distinguished Lecture at Lima (Peru), Aug 11, 2011;
  - (viii) IEEE Comm. Society Distinguished Lecture at Montreal, Canada, Sept 19, 2011;
  - (ix) IEEE Comm. Society Distinguished Lecture at Quebec City, Canada, Sept 21, 2011.
- “Autonomous Aero-Visual and Sensor Based Inspection Network for Asset Monitoring,”
    - (i) IEEE Comm. Society Distinguished Lecture at NCKU Tainan, Taiwan, on March 12, 2010;
    - (ii) IEEE Comm. Society Distinguished Lecture at National Taiwan University, Taipei, Taiwan, March 15, 2010;
    - (iii) IEEE Comm. Society Distinguished Lecture at IEEE Region Coastal South Carolina, May 10, 2010;
    - (iv) IEEE Comm. Society Distinguished Lecture at IEEE Region Atlanta GA, May 11, 2010;
    - (v) IEEE Comm. Society Distinguished Lecture at IEEE Region Huntsville AL, May 12, 2010;
    - (vi) IEEE Comm. Society Distinguished Lecture at IEEE Ecuador, Aug 15, 2011;
    - (vii) IEEE Comm. Society Distinguished Lecture at New Brunswick, Canada, Sept 20, 2011;
    - (viii) IEEE Comm. Society Distinguished Lecture at Ottawa, Sept 22, 2011;
    - (ix) IEEE Comm. Society Distinguished Lecture at Fort Worth, October 25, 2011;
    - (x) IEEE Comm. Society Distinguished Lecture at Austin, October 26, 2011;
    - (xi) IEEE Comm. Society Distinguished Lecture at San Antonio, October 27, 2011;
    - (xii) Distinguished speech at IEEE RWW2012 Conference, Santa Clara, CA, Jan 16, 2012;
    - (xiii) IEEE Comm. Society Distinguished Lecture at Orange County, CA, Jan 16, 2012;
    - (xiv) IEEE Comm. Society Distinguished Lecture at Woodland Hills, CA, Jan 17, 2012;
    - (xv) IEEE Comm. Society Distinguished Lecture at San Fernando Valley, CA, Jan 18, 2012;
    - (xvi) IEEE Comm. Society Distinguished Lecture at Foothill, CA, Jan 18, 2012;
    - (xvii) IEEE Comm. Society Distinguished Lecture at San Diego, CA, Jan 19, 2012;
    - (xviii) IEEE Comm. Society Distinguished Lecture at ROCK RIVER VALLEY LIFE MEMBER AFFINITY GROUP, Northern Illinois University, Dekalb, Illinois, Nov 29, 2012.
  - “Multi-point to Multi-point Connections Using Complex Cycles: Cycle Finding Algorithm,” IEEE ANTS, Indian Institute of Technology, Bombay, Mumbai, Dec 17, 2010.
  - “RAKSHA: Reliable and Aggressive frameworkK for System design using High-integrity Approaches,” at
    - (i) Indian Institute of Technology, Delhi, New Delhi, India, January 7, 2011;
    - (ii) IEEE RASDAT workshop, Indian Institute of Technology, Chennai, India, January 8, 2011;
    - (iii) Indian Institute of Science, Bangalaoe, India, April 22, 2011;
    - (iv) Keynote speech at 2011 2nd World Congress on Computer Science and Information Engineering (CSIE 2011), held at Changchun, China, June 17, 2011;
  - “Sustainable Software Architectures,” opening talk for the session organized at The 7th International Conference on Distributed Computing and Internet Technologies, Bhubaneswar, February, 9, 2011.
  - “Emerging Computer-Communications Architectures,” NSF-ECEDHA Energy & Power Summer Program, Atlanta, July 11, 2011.
  - “Creating Information Infrastructure for Research Collaboration,” at the Merrill Advanced Studies Center Workshop, Nebraska City, NE, July 19, 2012.
  - “Understanding, Evaluating and Reporting Research Productivity and Impact,” at the Merrill Advanced Studies Center Workshop, Nebraska City, NE, July 18, 2013.
  - “Mechanisms for International Collaborations,” PES, Bangalore, India, May 2014.
  - “Data Driven Optical Networks,” IEEE CCW Workshop, Blue Bells, PA, Nov. 6-7, 2014.
  - “Research Methodology, a half day workshop for 250 PhD students,” Gujarat Technological University, June 2015.
  - “UAS Navigation in GPS-Denied Terrain Environments and Synthetic Vision,” Gujarat Technological University, March 2016.



- “Big Data in Context Panel,” The midwest Big Data Summer School, Iowa State University, June 20-24, 2016.
- “Memory Efficient Computation Management for All-to-All Big Data Interaction,” Gujarat Technological University, March 2017.
- “Storage and Memory Efficient Computation Management for Big Data Computations,” Keynote talk at Smart Systems, Innovation, and Computing Conference, Jaipur, India April 14, 2017.
- “Simple Problem Complex Solutions in Networking and Computing,”
  - (i) keynote talk at Confluence-2018 conference, held at Amity University Noida, India, January 12, 2018.
  - (ii) Invited talk at BITS Pilani, India, January 31, 2018.
  - (iii) keynote talk at ICETCE (International Conference on Emerging Technology in Computer Engineering) 2018, Held at Jaipur February 2, 2018.
- “Managed Storage Solutions for Big Data,” Keynote talk at Smart Systems, Innovation, and Computing Conference, Jaipur, India, January 2019.
- “Knowledge Discovery Techniques for Transactional Data,” keynote talk at ICETCE (International Conference on Emerging Technology in Computer Engineering) 2019, Held at Jaipur February 2019.
- “Introduction to College of Engineering Research,” presentation to various ISU Foundation organized events on Jan 6, 2021, Feb 4, 2021, March 16, 2021.
- “Hardware System Architectures and Efficient DNN Inference,” Keynote talk at Smart Systems, Innovation, and Computing Conference, Jaipur, India, January 23, 2021.
- “Effectiveness of Computing Platforms on Optimized Deep Learning Neural Network Models,” Keynote talk at Confluence-2021 conference, held at Amity University Noida, India, January 28, 2021.
- “A Study of Effectiveness of Computing Platforms on Optimized Deep Learning Neural Network Models,” Gujarat Technological University, a workshop held for 200 PhD students, January 29, 2021.
- “Computation Organization of Optimized Deep Learning Neural Networks” Plenary talk at ICETCE (International Conference on Emerging Technology in Computer Engineering), Jaipur, India, February 3-4, 2021.
- “Software Testing and Reliability Modeling Methods” A two hour presentation on June 15, 2021 at Recent Trends in Software Testing workshop, organized on Virtual platform by Vishwakarma Government Engineering College, Chandkheda-382424, Ahmedabad, Gujarat, India, held during June 12-16, 2021.
- “Neural Architecture Search: A Hardware Perspective,” Gujarat Technological University, a workshop held for 200 PhD students, December 27, 2021.
- “Neural Architecture Search: A Hardware Perspective,” Keynote talk at Confluence-2022 conference, held at Amity University Noida, India, January 27-28, 2022.
- “Neural Architecture Search: A Hardware Perspective” Keynote talk at ICETCE (International Conference on Emerging Technology in Computer Engineering), Jaipur, India, February 4-5, 2022.

## 9. Publications:

### Books and Book Chapters:

1. A. K. Somani, A. Mundra, R. Doss, and S. Bhattacharya (Eds.), "Smart Systems: Innovations in Computing, Proceeding of SSIC 2021," ISBN 978-981-16-2876-4, January 2022.
2. A. K. Somani, "Reliability of Redundant Fault Tolerant Systems," J. Webster (ed.), Wiley Encyclopedia of Electrical and Electronics Engineering. John Wiley & Sons, Inc, 2019, DOI: 10.1002/047134608X.W6413.pub2. 18 double column IEEE journal format.
3. A. K. Somani, R. S. Shekhawat, A. Mundra, S. Srivastava, V. K. Verma(Eds.), "Smart Systems and IoT: Innovations in Computing, Proceeding of SSIC 2019," ISBN 978-981-13-8405-9, December 2019.
4. A. K. Somani, S. Srivastava, A. Mundra, S. Rawat (Eds.), "Proceedings of First International Conference on Smart System, Innovations and Computing SSIC 2017," Jaipur, India, ISBN 978-981-10-5828-8, 2017.
5. Mayank Mishra and A. K. Somani, "On-Disk Data Processing: Issues and Future Directions," arXiv preprint arXiv:1709.02718.
6. A. K. Somani and Ganesh Daka (Eds.), "Big Data Analytics. Tools and Technology for Effective Planning," Chapman & Hall/CRC Big Data Series, 2017.
7. Mayank Mishra, Pratik Mishra, and A. K. Somani, "Understanding the Data Science behind Business Analytics," in the edited book "Big Data Analytics: Tools and Technology for Effective Planning" ISBN 9781498784368, 2017.
8. Piyush Lakhawat and A. K. Somani, "Big Data Cluster Analysis: A Study of Existing Techniques and Future Directions," in the edited book "Big Data Analytics: Tools and Technology for Effective Planning" ISBN 9781498784368, 2017.
9. Karthik B. Subramanya and A. K. Somani, "Enhanced Feature Mining and Classifier Models to Predict Customer Churn for an e-Retailer," in the edited book "Big Data Analytics: Tools and Technology for Effective Planning" ISBN 9781498784368, 2017.
10. Pratik Mishra, Mayank Mishra, A. K. Somani, "Application of Hadoop Ecosystem Tools," in the edited book "NoSQL: Database for Storage and Retrieval of Data in Cloud" ISBN 9781138032392, 2016.
11. Parijat Shukla and A. K. Somani, "A Scalable Record Linkage Technique for NoSQL Databases using GPGPUs," in the edited book "NoSQL: Database for Storage and Retrieval of Data in Cloud" ISBN 9781138032392, 2016.
12. 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 2016, 31 pages.
13. JinWei Tioh, M. Mina, R. J. Weber and Arun K. Somani, "Fiber Optic Network Components," in Instrument Engineers Handbook: Process Software and Digital Networks, Fourth Edition, Taylor & Francis Group, edited by Halit Eren, 2011.
14. 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.
15. 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.
16. 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.
17. A. K. Somani, "Survivability and Traffic Grooming in Optical Networks," **Cambridge Press Book**, 436 pages, 2006.

18. 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).
19. 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).
20. 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).
21. 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).
22. A. K. Somani, "Network Design," invited paper in Wiley Encyclopedia of Electrical and Electronics Engineering, 1998, pp. 132-153 (22 pages).
23. 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).
24. 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).
25. 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).
26. 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).
27. 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:**

28. R. Yelaswarapu and A. K. Somani, "Addressing multiple bit/symbol errors in DRAM" in PeerJ Computer Science journal 7:e359. Jan 2021, <https://doi.org/10.7717/peerj-cs.359>.
29. Teng Wang, Ye Zhao, Jiawei Wang, Arun K. Somani, Changyin Sun, "Attention-Based Road Registration for GPS-Denied UAS Navigation," IEEE Transactions on Neural Networks and Learning Systems, Print ISSN: 2162-237X Online ISSN: 2162-2388 Digital Object Identifier: 10.1109/TNNLS.2020.3015660. Published in Vol. 432(4). April 2021, pp. 1788-1800.
30. T. Wang and A.K. Somani, "Aerial-DEM Geolocalization for GPS-Denied UAS Navigation," Machine Vision and Applications, accepted in 2019, 31(1)2020), pp. 1-12, doi:10.1007/s00138-019-01052-6.
31. Parijat Shukla and Arun K. Somani, "Tree Matching on Parallel Machines using Data Shaping," in Proc. of Services Transactions on Big Data (STBD, ISSN: 2326-442X), 2018.
32. C. J. Kleinheksel and A. K. Somani, "Enhancing Fault Tolerance and Resource Utilization in Unidirectional Quorum-based Cycle Routing," in IEEE/ACM Transactions on Networking, 2018, DOI: 10.1109/TNET.2018.2811386, 14 pages, March 2018.
33. T. Wang, K. Gopalakrishnan, O. Smadi, A.K. Somani, "Automated shape-based pavement crack detection approach," Transport 33 (3), pp. 598-608, 2018.

34. Pratik Mishra and A. K. Somani, "Host Managed Contention Avoidance Storage Solutions for Big Data," in *Journal of Big Data Systems*, Springer Nature, 2017, 4:18. DOI 10.1186/s40537-017-0080-9.
35. V. K. V. Yeleswarapu and A. K. Somani, "A Memory Efficient Parallel All-Pairs Computation Framework: Computation Communication Overlap," in: Wyrzykowski R., Dongarra J., Deelman E., Karczewski K. (eds) *Parallel Processing and Applied Mathematics, PPAM 2017. Lecture Notes in Computer Science*, vol 10777. Springer, pp 443-458. DOI: <https://doi.org/10.1007/978-3-319-78024-5-39>.
36. C. J. Kleinheksel and A. K. Somani, "Efficient Distributed All-Pairs Algorithms: Management using Optimal Cyclic Quorums," in *IEEE Transactions on Parallel and Distributed Systems*, 2017, Volume 29, Issue 2, pp. 391-404, DOI:10.1109/TPDS.2017.2707417.
37. N. D. P. Avirneni, Prem Kumar, and A. K. Somani, "Managing contamination delay to improve Timing Speculation architectures," *PeerJ Computer Science* 2:e79 <https://doi.org/10.7717/peerj-cs.79>, August 2016.
38. C. J. Kleinheksel and A. K. Somani, "Optical quorum cycles for efficient communication," in *The Photonic Network Communications*, April 2016, Volume 31, Issue 2, pp 196-205.
39. N. D. P. Avirneni, P. K. Ramesh, and A. K. Somani, "Utilization aware Power Management in Reliable and Aggressive Chip Multi Processors," in *IEEE Transactions on Computers*, Volume: 65, Issue: 3, March 1 2016, pp. 979-991. DOI: 10.1109/TC.2015.2439277.
40. Teng Wang, Koray Celik, and Arun K. Somani, "Characterization of mountain drainage patterns for GPS-denied UAS navigation augmentation," *Machine Vision and Applications*, January 2016, Volume 27, Issue 1, pp 87-101, DOI: 10.1007/s00138-015-0723-9.
41. Sarvesh Bidkar, Ashwin Gumaste, Puneet Ghodasara, Annirudha Kushwaha, Jianping Wang, and Arun Somani, "Scalable Segment Routing A New Paradigm for Efficient Service Provider Networking Using Carrier Ethernet Advances," *Journal of Optical Communications and Networking*, Vol. 7, Issue 5, pp. 445-460, 2015. doi: 10.1364/JOCN.7.000445
42. N. D. P. Avirneni and A. K. Somani, "Countering power analysis attacks using Reliable and Aggressive Designs," *IEEE Transactions on Computers*, pp. 1408-1420, accepted Jan. 2013. Volume: 63, Issue: 6, June 2014, DOI: 10.1109/TC.2013.9.
43. N. Pavan Kumar Gorti and Arun K. Somani, "Reliability aware dynamic voltage and frequency scaling for improved microprocessor lifetime," *ACM SIGOPS Operating Systems Review*, Vol. 47, No. 3, December 2013, pp. 10-17. doi:10.1145/2553070.2553073.
44. Siddhartha Kumar Khaitan, James. A. McCally, and Arun K. Somani, "Proactive Task scheduling and stealing in master-slave based load balancing for parallel contingency analysis," *Elsevier Journal of Electric Power Systems Research*, Volume 12, Issue 1-2, October 2013.
45. Koray Celik and Arun K. Somani, "Monocular Vision SLAM for Indoor Aerial Vehicles," *Journal of Electrical and Computer Engineering*, Volume 2013 (2013), Article ID 374165, 15 pages.
46. E. Ibanez, Steve Lavrenz, Diego Meja, Venkat Krishnan, Konstantina Gkritza, James McCalley, Arun K. Somani, "Resiliency and robustness in long-term planning of the national energy and transportation system," *International Journal of Critical Infrastructures*, Volume 12, Issue 1-2, 2013.
47. Ashwin Gumaste, Tamal Das, Raviraj Vaishampayan, Jianping Wang, and Arun K. Somani, "Extending Light-Trails to Regional Networks: Multi-hop Light-Trails (MLT) System Design and Performance," in *Journal of Optical Communications and Networking*, Vol. 4, Issue 12, pp. 10461061 (2012).
48. A. K. Somani and Jinxu Ding, "Parallel Computing Solution for Capacity Expansion Network Flow Optimization Problems," in *Journal of Computing*, July 2012.
49. N. D. P. Avirneni and A. K. Somani, "Low Overhead Soft Error Mitigation Techniques for High-Performance and Aggressive Designs," *IEEE Transactions on Computers*, April 2012, Vol 61(04), pp. 488-501.

50. D. Lastine, S. Sankaran and A. K. Somani, "A Fault-Tolerant Multipoint Cycle Routing Algorithm (MCRA) (An Invited Paper)," in Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, LNICST 66, March 2012, pp. 341-360.
51. O. Turkcu, A. K. Somani, and S. Subramaniam, "Multicast Routing in Hierarchical Optical Networks Using Collection-Distribution Networks (An invited paper)," in Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, LNICST 66, March 2012, pp. 283-301.
52. Jin-Wei Tioh, N. VanderHorn, M. Mina, R. J. Weber, A. K. Somani, "Reprogrammable High-Speed Platform: Shifting the Paradigm in Education, Research, and Engineering," in the IEEE Communications Magazine, January 2012, pp. 153-159.
53. A. Gumaste, T. Das, A. Mathew, and A. K. Somani, "An Autonomic Virtual Topology Design and Two-Stage Scheduling Algorithm for Light-trail WDM Networks," in IEEE/OSA Journal of Optical Networking (JOCN), Vol. 3, No. 4, April 2011, pp. 372-389.
54. E. Ibanez, K. Gkritza, J. McCalley, D. Aliprantis, R. Brown, A. Somani, and L. Wang, "Interdependencies between Energy and Transportation Systems for National Long Term Planning," in Sustainable Infrastructure Systems: Simulation, Imaging, and Intelligent Engineering, K. Gopalakrishnan, S. Peeta, editors, Springer-Verlag, Berlin, 2010, pp. 53-76.
55. P. K. Ramesh, V. Subramanian, and A. K. Somani, "System Level Analysis for Achieving Thermal Balance and Lifetime Reliability in Reliably Overclocked Systems," International Journal on Advances in Systems and Measurements, IARIA ISSN 1942-261x, Vol. 2, No. 4, 2009, pp. 258-268. [http://www.iariajournals.org/systems\\_and\\_measurements](http://www.iariajournals.org/systems_and_measurements).
56. S. Balasubramanian and A. K. Somani, "Design Algorithms for Path-Level Grooming of Traffic in WDM Metro Optical Networks," in IEEE Communication Magazine, Vol. 46, No. 11, November 2008, pp. 91-97.
57. 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.
58. 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.
59. 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, . 7, Issue 6, July 2008, pp. 617-634.
60. 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.
61. 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.
62. 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.
63. 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 3105 - 3164.
64. 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.
65. 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.

66. 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, January 2006.
67. 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.
68. 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.
69. 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.
70. 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. doi: 10.1109/TNET.2005.860103.
71. 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.
72. 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.
73. 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.
74. 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.
75. 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.
76. 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.
77. 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.
78. 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.
79. 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.
80. 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.
81. 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.
82. 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.
83. 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.

84. 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.
85. 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.
86. 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.
87. S. Kim and A. K. Somani, "On-Line Integrity Monitoring of Microprocessor Control Logic," in the Microelectronics Journal, 2001.
88. G. Mohan, A. K. Somani, and C. S. R. Murthy, "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.
89. 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.
90. L. Li and A. K. Somani, "Efficient Algorithms for Wavelength Converter Placement in All-Optical Networks," in Optical Networking Magazine, 2001.
91. H. Kim, A. K. Somani and A. Tyagi, "A reconfigurable multifunction computing cache architecture," in IEEE Transactions on Very Large Scale Integration (VLSI) Systems, vol. 9, no. 4, pp. 509-523, Aug. 2001, doi: 10.1109/92.931228.
92. 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.
93. 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.
94. G. Krishnamurthi, M. Azizoğlu, A. K. Somani, "Optimal Distributed Location Management in Mobile Networks," in *Mobile Applications and Networking (MONET) journal*, 2001.
95. 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.
96. 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.
97. 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.
98. 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.
99. 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.
100. 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.
101. 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.
102. 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.

103. 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.
104. 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.
105. 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.
106. 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.
107. 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.
108. 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.
109. 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.
110. 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.
111. 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.
112. A. K. Somani and N. H. Vaidya, "Understanding Fault Tolerance and Reliability," *IEEE Computer*, Vol. 30, No. 4, April 1997, pp. 45-50.
113. 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.
114. A. K. Somani, "Simplified Phased-Mission System Analysis for Systems with Independent Component Repairs," NASA CR-198318, ICASE Report No. 96-23, March 1996.
115. 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.
116. 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.
117. 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.
118. S. Subramaniam and A. K. Somani, "Multicasting in ATM networks using MINs," in *Computer Communications*, vol. 19, No. 8, August 1996, pp. 712-722.
119. 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.
120. 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.



121. 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.
122. 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.
123. 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.
124. 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.
125. A. K. Somani and S. Thatte, "The Helical Cube Network," *NETWORKS, An International Journal*, Vol. 26 (1995), pp. 87-100.
126. M. Harrington and A. K. Somani, "Synchronizing hypercube networks in the presence of faults," in *IEEE Transactions on Computers*, vol. 43, no. 10, pp. 1175-1183, Oct. 1994, doi: 10.1109/12.324543
127. 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.
128. 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.
129. C. Tarnag, 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.
130. 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.
131. 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.
132. S. B. Choi and A. K. Somani, "Rearrangeable Circuit-Switched Hypercube Architecture for Routing Permutations," *JPDC*, Vol. 19, 1993, pp. 125-133.
133. A. K. Somani, J. Ritcey, and S. Au, "Phased-Mission Reliability Analysis," in *IEEE Transactions on Reliability*, December 1992, pp. 504-511.
134. 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.
135. S. B. Choi and A. K. Somani, "The Generalized Folding-Cube Network," *NETWORKS, An International Journal*, Vol. 21, March 1991, pp. 267-294.
136. 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.
137. 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.
138. 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.

139. 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.
140. 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.
141. 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.

#### Conference Proceedings:

142. Yiming Bian and A. K. Somani, "An Efficient Systematic Approach to Find All Cyclic Quorum Sets with All-pairs Property," in *Proceedings of the 2021 IEEE International Conference on Big Data (Big Data)*, held in Dec. 2021, pp. 197-206, doi: .
143. Sander-Frigau Matthias, Tianyi Zhang, Chen-Ye Lim, Hongwei Zhang, Ahmed E. Kamal, and Arun K. Somani, "A Measurement Study of TVWS Wireless Channels in Crop Farms," in the *Proceedings of IEEE 18th International Conference on Mobile Ad Hoc and Smart Systems (MASS) 2021: Invited Papers Track*, held on 4-7 October, 2021, pp. 344-354, doi: yyyy.
144. Hongwei Zhang, Yong Guan, Ahmed Kamal, Daji Qiao, Mai Zheng, Anish Arora, Ozdal Boyraz, Brian Cox, Thomas Daniels, Matthew Darr, Doug Jacobson, Ashfaq Khokhar, Sang Kim, James Koltres, Jia Liu, Mike Luby, Larysa Nadolny, Joshua Peschel, Patrick Schnable, Anuj Sharma, Arun K. Somani, and Lie Tang, "ARA: A Wireless Living Lab Vision for Smart and Connected Rural Communities," in the *Proceedings of ACM WiNTECH, New Orleans, LA, USA, October 2021*, pp. xx, doi: .
145. Krishna Teja Chitty-Venkata, A. K. Somani, and S. Kothandaraman "Searching Architecture and Precision for U-net based Image Restoration Tasks," in *Proceedings of the 2021 IEEE International Conference on Image Processing (ICIP)*, held in Sept. 2021, pp. 1989-1993, doi: .
146. Yiming Bian and A. K. Somani, "Establishing Efficient All One-to-One Paths by Exploring Cyclic Quorum Sets," in *Proceedings of the 2021 IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)*, held on 12-13 July 2021, pp. 1-2, doi: .
147. Krishna Teja Chitty-Venkata and A. K. Somani, "Array-Aware Neural Architecture Search," in *Proceedings of the 32nd IEEE International Conference on Application Specific Systems Architectures and Processors (ASAP)*, held on 7-8 July 2021, pp. 125-132, doi: .
148. Sander-Frigau Matthias, Tianyi Zhang, Hongwei Zhang, Ahmed E. Kamal, and Arun K. Somani, "Physical Wireless Resource Virtualization for Software-Defined Whole-Stack Slicing," in the *Proceedings of IEEE International Conference on Network Softwarization*, held on 28 June - 2 July, 2021, pp. 106-114, doi: . **Best Paper Award winner.**
149. Krishna Teja Chitty-Venkata and A. K. Somani, "Model Compression on Faulty Array-based Neural Network Accelerator," in *Proceedings of the IEEE 25th Pacific Rim International Symposium on Dependable Computing (PRDC)*, 2020, pp. 90-99.
150. Krishna Teja Chitty-Venkata and A. K. Somani, "Calibration Data-Based CNN Filter Pruning for Efficient Layer Fusion," in *Proceedings of the IEEE 6th International Conference on Data Science and Systems (DSS)*, 2020, pp. 1300-1307.
151. Krishna Teja Chitty-Venkata and A. K. Somani, "Array Aware Training/Pruning: Methods for Efficient Forward Propagation on Array-based Neural Network Accelerators," in *Proceedings of the 31st IEEE International Conference on Application Specific Systems Architectures and Processors (ASAP)*, July 2020, pp. 37-44, doi: 10.1109/ASAP49362.2020.00016.
152. Krishna Teja Chitty-Venkata and A. K. Somani, "Impact of Structural Faults on Neural Network Performance," in *Proceedings of International Conference on Application Specific Systems (ASAP), Architectures and Processors*, 2019, pp. 35-35, doi: 10.1109/ASAP.2019.00-38.

153. Pratik Mishra and A. K. Somani, "LDM: Lineage-Aware Data Management in Multi-tier Storage Systems," in Proceedings of FICC, 2019, held at San Francisco, March 2019.
154. Sidharth Sharma, Aniruddha Kushwaha, A. K. Somani, and Ashwin Gumaste, "Designing Highly-Available Service Provider Networks with NFV Components, 28th International Conference on Computer Communication and Networks, 2019, pp. 1-9.
155. Ravikumar Yelaswarapu and A. K. Somani, "SSCMSD - Single-Symbol Correction Multi-Symbol Detection for DRAM subsystem" in IEEE PRDC 2018, December 2018, Teipei, Taiwan.
156. Sidharth Sharma, Aniruddha Kushwaha, A. K. Somani, and Ashwin Gumaste, "Designing multi-layer provider networks for circular disc failures," International Conference on Optical Network Design and Modeling (ONDM), 2018, pp. 65-70.
157. P Lakhawat and A. K. Somani, "Adaptive Cluster Based Discovery of High Utility Itemsets," International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, Nov. 2017, pp. 139-163.
158. P. Lakhawat, M. Mishra, and A. K. Somani, "A Clustering based Prediction Scheme for High Utility Itemsets," in Proceedings of International Conference on Knowledge Discovery and Information Retrieval, paper number KDIR17-RP-46, Madeira, Portugal, Nov. 2017, pp. 123-134, DOI: 10.5220/0006590001230134.
159. Venkata Kasi Viswanath Yeleswarapu and A. K. Somani, "Efficient Parallel All-Pairs Computation Framework: using Computation - Communication Overlap," in the Proceedings of 12th Intl. Conference on Parallel Processing and Applied Mathematics (PPAM 2017), Lublin, Poland, September, 2017, oral presentation.
160. Rashmi Girmal and A. K. Somani, "LowLEAC: Low Leakage Energy Architecture for Caches," in the Proceedings of 2017 IEEE Conference on Dependable and Secure Computing, held at Taipei, Taiwan, August 2017.
161. Karthik Subramanya and A. K. Somani, "Enhanced Feature Mining and Classifier Models to Predict Customer Churn for an e-retailer," in the Proceedings of Confluence 2017, held at Delhi, India, January 2017, pp. 531-536.
162. P. Lakhawat, M. Mishra, and A. K. Somani, "A Novel Clustering Algorithm to Capture Utility Information in Transactional Data," in the Proceedings of KDIR 2016, 8th International on Knowledge Discovery and Information Retrieval, Nov. 9-11, 2016, Porto, Portugal, pp. 456-462.
163. Pratik Mishra, Mayank Mishra, A. K. Somani, "Bulk IO Storage Management for Big Data Applications," in the IEEE Computer Society Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS, 2016), London, UK, September 19-21, 2016, DOI: 10.1109/MASCOTS.2016.61.
164. C. J. Kleinheksel and A. K. Somani, "Unidirectional Quorum-based Cycle Planning for Efficient Resource Utilization and Fault Tolerance," in the 25th International Conference on Computer Communication and Networks (ICCCN 2016), 2016, Waikoloa, Hawaii, USA, August 2016, Invited Paper.
165. C. J. Kleinheksel and A. K. Somani, "Scaling Distributed All-Pairs Algorithms," in Proceedings of the Information Science and Applications 2016, Springer Singapore, 2016. pp. 247-257.
166. Teng Wang, Kasthurirangan Gopalakrishnan, Arun Somani, Omar Smadi, and Halil Ceylan, "Machine-Vision-Based Roadway Health Monitoring and Assessment: Development of a Shape-Based Pavement-Crack Detection Approach," Midwest Transportation Center, U.S. Department of Transportation, Office of the Assistant Secretary for Research and Technology, Final Report, January 2016.
167. C. J. Kleinheksel and A. K. Somani, "Enhancing Fault Tolerance Capabilities in Quorum-based Cycle Routing," in The 7th International Workshop on Reliable Networks Design and Modeling (RNDM) 2015, Munich, Germany, September 2015.
168. Lizandro D. Solano-Quinde, Brett M. Bode, and A. K. Somani, "Automatic Parallelization of GPU Applications Using OpenCL," in the Proc. of Asia-Pacific Conference on Computer Aided System Engineering (APCASE) 2015, pp. 276-283, July 2015.

169. Teng Wang, Raj Aggarwal, A. K. Somani, "Human Tracking Using Delphi ESR-Vision Fusion in Complex Environments," in Proceedings of WORLDCOMP'15 - The 2015 World Congress in Computer Science, Computer Engineering, and Applied Computing, Las Vegas, Nevada, USA, July 27-30, 2015.
170. Haoyuan Lin, Raj Aggarwal, and A. K. Somani, "Foreign Object Detection (FOD) Using Multi-Class Classifier with Single Camera vs. Distance Map with Two Cameras," in Proceedings of WORLDCOMP'15 - The 2015 World Congress in Computer Science, Computer Engineering, and Applied Computing, Las Vegas, Nevada, USA, July 27-30, 2015.
171. C. J. Kleinheksel and A. K. Somani, "Resource Efficient Redundancy Using Quorum-based Cycle Routing in Optical Networks," in The 17th International Conference on Transparent Optical Networks (ICTON) 2015, Budapest, Hungary, July 2015.
172. Parijat Shukla and A. K. Somani, "Tree Matching Using Data Shaping," in Proc. of IEEE Big Data Congress 2015, New York, 2015.
173. Parijat Shukla and A. K. Somani, "Context-Aware Duplicate Detection in Semi-structured Data Streams," in Proc. of IEEE Congress on Services, Anchorage Alaska, June 2014.
174. Teng Wang, K. Çelik, and A. K. Somani, "Characterization of Mountain Drainage Patterns for GPS-Denied UAS Navigation Augmentation," Proceedings of IEEE International Conference on Pattern Recognition, August 2014, Stockholm, Sweden, pp. 1852-1857.
175. S. Bidkar, A. Gumaste and A. K. Somani, "A Scalable Framework for Segment Routing in Service Provider Networks: The Omnipresent Ethernet Approach," in Proceedings in HPSR, July 2014.
176. Teng Wang, K. Çelik and A. K. Somani, "Meta-image navigation augmenters for GPS denied Mountain Navigation of small UAS," in Proc. SPIE 9076, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications XI, 907604, June 2014, 14 pages, doi: 10.1117/12.2050732.
177. A. K. Somani and D. Lastine, "Optical Paths Supporting Quorums for Efficient Communication," in Proceedings of ICONC, Nov. 2014, SuZhao, China.
178. Julianne M. Krennrich, A. K. Somani and M. H. Spalding, "Understanding, Evaluating and Reporting Research Productivity and Impact," in Proceedings of Merrill Advanced Studies Center Dole Human Development Center Workshop, Nebraska City, NE, July 2013.
179. A. K. Somani, "Dynamic Management of Bursty Traffic over Multiple Channels," in Proceedings of ICTON 2013, June 2013.
180. Koray Celik, Arun K. Somani, Bernard Schnauffer, Patrick Y. Hywang, Gary A. McGraw, and Jeremy Nadke, "Meta-image navigation augmenters for GPS denied mountain navigation of small UAS)," in Proc. SPIE 8713, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications X, 87130, May 2013); doi:10.1117/12.2015630.
181. P. N. Gorti and A. K. Somani, "Runtime Optimization Utilizing Program Structure," in Proceedings of 18th annual International Conference on Advanced Computing and Communications, Chennai, India, Dec. 2012.
182. P. N. Gorti and A. K. Somani, "Thermal Aware Processor Operation Point Management," in Proceedings of GCM'2012 workshop, held in conjunction with 2012 IEEE/ACM Fifth International Conference on Utility and Cloud Computing (UCC 2012), Chicago, Illinois, October 2012.
183. A. K. Somani and P. N. Gorti, "Runtime Optimization Utilizing Program Structure (Extended Abstract)," in Proceedings of ACCS workshop on Adaptive Computing, September 14, 2012, Bangalore, India, Sept 14, 2012.
184. A. K. Somani, "Creating Information Infrastructure for Research Collaboration," in Proceedings of Merrill Advanced Studies Center Dole Human Development Center Workshop, Nebraska City, NE, July 18-19, 2012.
185. K. Çelik and A. K. Somani, "Wand-Free On-The-Fly Intrinsic Monocular Camera Autocalibration," in Proceedings of WORLDCOMP'12 - The 2012 World Congress in Computer Science, Computer Engineering, and Applied Computing, Las Vegas, Nevada, USA, July 16-19, 2012.

186. B. H. Ramaprasad, A. K. Somani, and V. M. Vokkarane, "Dynamic Non-Continuous Single Slot Advance Reservation over Wavelength Routed Networks," in Proc. of IEEE ICNC 2012, Hawaii, Jan 30-Feb 2, 2012.
187. D. Lastine, S. Sankaran and A. K. Somani, "Fault-Tolerant Multipoint Cycle Routing Algorithm (MCRA) (An Invited Paper)," in Proc. of Broadnets 2010, Athens, Greece, Oct. 2010.
188. A. K. Somani, D. Lastine, and S. Sankaran, "Finding complex cycles through a set of nodes," in Proceedings of IEEE Globecom 2011, held at Houston, December 5-9, 2011, pp. 1-5.
189. A. K. Somani and Dan Congreve, "Scheduling Linear Network for Space and Time Efficiency," in Proceedings of 18th IEEE workshop on LAN/MAN, held at Raleigh/Durham, October 2011, pp. 1-6.
190. Venkat Krishnan, Jinxu Ding, James McCalley and Arun K. Somani, "Computational Challenges in 21st Century National Energy and Transportation Infrastructures Planning," Current Challenges in Computing 2011: Energy Resource Modeling, Napa Valley, CA, Aug 2011.
191. A. K. Somani, V. M. Vokkarane, and B. H. Ramaprasad, "Dynamic Advance Reservation with Delayed Allocation over Wavelength-Routed Networks," in Proceedings of ICTON, held at Stockholm, Sweden, June 27-30, 2011. pp. Tu.A.3.1 (5 pages).
192. O. Turkcu and A. K. Somani, "Efficient Multicasting Approaches Using Collection-Distribution Networks," in Proc. of INFOCOMM 2011, Shanghai, China, April 2011.
193. A. K. Somani and A. Gumaste, "Light Trails: Distributed Optical Grooming for Emerging Data Center, Cloud Computing, and Enterprise Applications," in Proc. of OFC, 2011, Invited Paper, March, 7-10, 2011.
194. Lizandro Solano-Quinde, Z.J. Wang, Brett Bode, and A. K. Somani, "Unstructured Grid Applications on GPU Performance Analysis and Improvement," in Proc. of ACM Workshop on General-Purpose Computation on Graphics Hardware (GPGPU-4), New Port Beach, CA, March, 5-6, 2011.
195. E. Ibanez, V. Krishnan, S. Lavrenz, D. Mejia, J. McCalley, and A. Somani, "Resiliency and robustness in long-term planning of the national energy and transportation system, 2nd RESIN Workshop, Tucson, AZ, Jan. 2011.
196. O. Turkcu, A. K. Somani, and S. Subramaniam, "Multicast Routing in Hierarchical Optical Networks Using Collection-Distribution Networks (An invited paper)," in Proc. of Broadnets 2010, Athens, Greece, Oct. 2010.
197. Jinxu Ding and A. K. Somani, "A MBA (Minimal Budget Approach) algorithm for large-scale incorporation of clean energy to current electricity systems," in the Proc. of the 2010 IEEE Conference on Innovative Technologies for an Efficient and Reliable Electricity Supply, Waltham, MA, Sept. 2010.
198. Jinxu Ding and A. K. Somani, "Reduction of green house gas emission by clean power trading," in Proc. of IEEE Energy Conversion Congress and Exposition, Atlanta, GA, Sept. 2010.
199. J. McCalley, E. Ibanez, Y. Gu, K. Gkritza, D. Aliprantis, L. Wang, A. Somani, and R. Brown, "National Long-Term Investment Planning for Energy and Transportation Systems," in Proc. of IEEE PES General Meeting 2010, Minneapolis, Minnesota, Jul. 2010.
200. Jinxu Ding and A. K. Somani, "Analysis on the impacts of the transmission line capacity expansion on clean power system development to realize clean energy policies," in the Proc. of the 2nd International Symposium on Energy Engineering, Economics and Policy, Orlando, FL, June 2010.
201. A. K. Somani and D. Lastine, "Determining Optimal Light-Trail Length," in Proc. of 2010 17th IEEE Workshop on Local and Metropolitan Area Networks, May 2010. **Recognized as one of the three Best Papers.**
202. D.S.Q. Lizandro, B. M. Bode and A. K. Somani, "Coarse Grain Computation-Communication Overlap for Efficient Application-Level Checkpointing for GPUs," in Proc. of the IEEE Electro/Information Technology Conference (EIT) 2010 conference, Normal, IL, May 20-22, 2010.

203. Jinxu Ding and A. K. Somani, "A long-term investment planning model for mixed energy infrastructure integrated with renewable energy," in Proc. of IEEE 2nd Annual IEEE Green Technologies, April 2010, Dallas Forth Worth, TX, pp. 1-10.
204. 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.
205. A. K. Somani and K. Çelik, "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.
206. K. Çelik, S. Chung, M. Clausman and A. K. Somani, "Monocular vision SLAM for indoor aerial vehicles," 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems, St. Louis, MO, 2009, pp. 1566-1573, doi: 10.1109/IROS.2009.5354050.
207. 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 Creenet Broadnets 2009, Sept. 2009, Madrid Spain.
208. 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, pp. 1-6.
209. Z. Le, B. Quan, M. Zhang, A. K. Somani, D. Lastine, and K. Balakrishnan, "Optimal Utilization with Fairness and Priority Considerations in Optical Networks Based on Light Trail," in Proc. of Symposium on Photonics and Optoelectronics (SOPO), Aug. 2009, pp. 1-4.
210. Jinxu Ding and A. K. Somani, "A Decentralized Resilient Mixed-energy Infrastructure (L3) Model of America in the Next 40 Years," in the Proc. of the 20th International Symposium of Mathematical Programming (ISMP), Chicago, IL, Aug. 2009.
211. V. Subramanian, P. K. Ramesh, and A. K. Somani, "Managing the Impact of On-Chip Temperature on the Lifetime Reliability of Reliably Overclocked Systems," at the Second International Conference on Dependability- DEPEND'09, June 18-23, Athens, Greece, 2009. **Won the Best Paper Award.**
212. 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 IEEE/IFIP International Conference on Dependable Systems Networks, June 2009, pp. 185 -194.
213. Jinxu 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.
214. K. Çelik, 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.
215. P. K. Ramesh, V. Subramanian, and A. K. Somani, "Thermal Management in Reliably Overclocked Systems," in Proc. of IEEE SELSE (Silicon Errors in Logic - System Effects)-5 2009, March 2009.
216. N. D. P. Avirneni, V. Subramanian, and A. K. Somani, "Soft Error Mitigation Schemes for High Performance and Aggressive Designs," in Proc. of IEEE Workshop SELSE-5 2009, March 2009.
217. 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 11th International Conference on Computer Modeling and Simulation (UKSIM 2009), Emmanuel College, Cambridge, England, 25-27, March 2009.
218. 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 15-17, 2008, pp. 1-3, Invited Paper.
219. 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.

220. E. Ibanez, J. McCalley, D. Aliprantis, R. Brown, K. Gkritza, A. Somani, and L. Wang, "National Energy and Transportation Systems: Interdependencies within a Long Term Planning Model," in Proc. of IEEE Energy 2030 Conference, Atlanta, Georgia, November 2008.
221. K. Çelik, 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.
222. 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.
223. 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.
224. 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.
225. 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.
226. K. Çelik, 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.**
227. D. Lastine and A. K. Somani, "Supplementing non-simple p-Cycles with preconfigured lines," in Proc. of IEEE ICC, May 2008, pp. 5443-5447.
228. V. Subramanian, Naga Durga Prasad Avirneni, and A. K. Somani, "Conjoined Processor: A Fault Tolerant High Performance Microprocessor," in Proc. of IEEE Workshop SELSE-4, Austin, TX, March 2008.
229. 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.
230. 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.
231. 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.**
232. W. He and A. K. Somani, "Comparison of Protection Mechanisms: Capacity Efficiency and Recovery Time," in Proc. of IEEE ICC 2007, June 2007.
233. 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.
234. 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, Bhubaneshwar, India, Dec.2006, pp. 14-26.
235. 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.
236. 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.
237. M. Sivakumar, K. M. Sivalingam, 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.

238. J. Chen, S. Kher, A. K. Somani, "Distributed Fault Detection of Wireless Sensor Networks," in Proc. of DIWANS-06 (Dependability issues in wireless ad-hoc sensor networks, 2006, LA, Sept. 2006).
239. 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.
240. 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.
241. 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.
242. 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.
243. H. Xu and A. K. Somani, "Partitioned Cache Shadowing for Deep Sub-Micron (DSM) Regime," in Proc. of Pacific Rim Dependability Symposium, Chnagsha, PRC, December 2005, pp/ 183-192.
244. 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, December 1-3, 2005, Kualalumpur, Malaysia.
245. 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.
246. 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).
247. 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.
248. S. Balasubramanian, A. K.Somani, and A. E. Kamal, "Sparsely Hubbed Light-Trail Networks," IEEE ICCCN, October 2005, pp. 249-254.
249. 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.
250. R. Gupta, V. Sekhri, and A. K. Somani, "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.
251. S. Kher, A. K. Somani, R. Gupta, "Network Selection Using Fuzzy Logic," in BROADNETS 2005 conference, October 2005, Boston, USA, pp. 941-950.
252. 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, doi: 10.1109/ICPADS.2005.157.
253. 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.
254. 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.
255. 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 .



256. 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.
257. 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.
258. 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**).
259. 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.
260. 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.
261. 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.
262. 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. doi: 10.1109/BROADNETS.2004.34.
263. 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.
264. 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.
265. 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, doi: 10.1109/ICC.2004.1312799.
266. 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.
267. 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.
268. 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.
269. 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.
270. 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.
271. 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.
272. 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.

273. 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.
274. 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.
275. 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.
276. 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.
277. 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%)
278. 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**.
279. 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.
280. 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.
281. 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.
282. 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.
283. 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.
284. R. Sangireddy, H. Kim and A. K. Somani, "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.
285. 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.
286. A. K. Somani, R. Srinivasan, and M. Sridharan, "Dynamic Routing in Survivable WDM Grooming Networks," in Proceedings of 40th Annual Allerton Conference on Communication, Control, and Computing, October 2002.
287. 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.
288. Tao Wu and A. K. Somani, "Necessary and Sufficient Condition for Crosstalk Attack Localization in All-Optical Networks," in Proceedings of APOC002, October 2002.

289. Sonal Pandey, A. K. Somani, and A. Tyagi, "A Reliable Protocol for Processing within IP-Routed Networks," in Proc. of IEEE ICCCN 2002, October 2002, pp. 84-89.
290. W. He, M. Sridharan and A. K. Somani, "Capacity Optimization for Surviving Double-Link Failures in Mesh-Restorable Optical Networks", in Proceedings of OptiComm 2002, July 2002, pp 13-24.
291. Tao Wu and A. K. Somani, "Attack Monitoring and Localization in All-Optical Networks", in Proceedings of OptiCom 2002, July 2002, pages 235-248. **(Received the Best Paper AWARD.)**
292. 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.
293. 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 14-18, 2002.
294. S. Kim and A. K. Somani, "Soft error sensitivity characterization for microprocessor dependability enhancement strategy" Proceedings International Conference on Dependable Systems and Networks, Washington, DC, USA, 2002, pp. 416-425, doi: 10.1109/DSN.2002.1028927.
295. 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.
296. M. Sridharan, R. Srinivasan, and A. K. Somani, "Dynamic routing with partial information in mesh-restorable optical networks," in Proceedings of the Sixth Working Conference on Optical Networks Design and Modelling, February, 2002.
297. J. Fang, R. Srinivasan and A. K. Somani, "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.
298. 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.
299. R. A. Omari, A. K. Somani, and G. Manimaran, "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.
300. R. Sangireddy and A. K. Somani, "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.
301. 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.
302. S. Kim and A. K. Somani, "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.
303. 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.
304. S. Thiagarajan and A.K. Somani, "Traffic grooming for survivable WDM mesh networks," in Proceedings of OPTICOMM 2001, August 2001.
305. S. Kim and A. K. Somani, "An Affordable Transient Fault Tolerance for Superscalar Processors," Fast Abstract of IEEE DSN-2001, July 2001.

306. 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.
307. S. Thiagarajan and A. K. Somani, "A Capacity Correlation Model for WDM Networks with Grooming Capabilities," in Proc. IEEE International Conference on Communications (ICC) 2001, June 2001, Helsinki, Finland, pp. 1592-1596. doi: 10.1109/ICC.2001.937188.
308. R. Srinivasan and A. K. Somani, "A Generalized Framework for Analyzing Time-Space Switched Optical Networks," in Proc. of INFOCOM 2001, pp. 179-188, April 2001.
309. 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.
310. 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.
311. 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.
312. 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.
313. M. Sridharan and A. K. Somani, "Revenue Maximization in Survivable WDM Networks," in Proc. of OPTICOMM 2000, October 2000, pp. 291-302.
314. S. Thiagarajan and A. K. Somani, "Capacity Fairness of WDM Networks with Grooming Capabilities," OPTICOMM 2000, Dallas, SPIE Proc. Vol. 4233, October 2000, pp. 191-201.
315. 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.
316. R. Al-Omari, A. K. Somani, and G. Manimaran, "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.
317. G. Mohan and A. K. Somani, "Routing dependable connections with specified failure restoration guarantees in WDM networks," Proceedings IEEE INFOCOM 2000, Tel Aviv, Israel, 2000, vol. 3, pp. 1761-1770 doi: 10.1109/INFCOM.2000.832576.
318. H. Kim, A. K. Somani, and A. Tyagi, "A Reconfigurable Multi-function Computing Cache Architecture," in the Proceedings of FPGA 2000, February 2000, pp. 85-94.
319. L. Li and A. Somani, "A New Analytical Model for Multifiber WDM Networks," in Proc. Globecom'99, Rio de Janeiro, Brazil, December 1999, pp. 1007-1011.
320. 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.
321. 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,
322. 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.
323. L. Li and A. K. Somani, "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.

324. Indu Peddibhotla and A. K. Somani, "Experimental Evaluation of Throughput Performance of IRTCP Under Noisy Channels," in the Proc. of Proceedings of the 2nd ACM international workshop on Wireless mobile multimedia (WoWMoM) 1999, July 1999.
325. S. Thiagarajan and A. K. Somani, "An efficient algorithm for optimal wavelength converter placement on wavelength-routed networks with arbitrary topologies," IEEE INFOCOM '99. 1999, pp. 916-923 vol. 2, doi: 10.1109/INFOCOM.1999.751481.
326. 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.
327. 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.
328. 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.
329. 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.
330. S. Kim and A. K. Somani, "Area Efficient Architectures for Information Integrity Checking in Cache Memories," in the Proceedings of International Symposium on Computer Architecture, May 1999, pp. 246-256.
331. H. S. Kim, A. K. Somani, and A. Tyagi, "On Reconfiguring Cache for Computing," in Proceedings FCCM '99, April 1999, pp. 296-297.
332. 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.
333. L. Li and A. K. Somani, "Efficient Algorithms for the Wavelength Converter Placement on All-Optical Networks," in Proc. Conference on Information Sciences and Systems, Maryland, March 1999.
334. 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.
335. 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.
336. G. Krishnamurthi, M. Azizoğlu, A. K. Somani, "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.
337. G. Krishnamurthi, S. Chessa, A. K. Somani, "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.
338. 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.
339. 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.
340. 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.

341. 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 the Proc. of IPSS, Orlando, pp.737-741, March 1998.
342. S. Subramaniam, M. Azizoğlu, 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.
343. 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.
344. 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, Teipei, Taiwan, pp. 78-84, December 1997.
345. 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, Teipei, Taiwan, pp. 15-21, December 1997.
346. S. Subramaniam, M. Azizoğlu, and A. K. Somani, "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**.
347. S. Subramaniam, A. K. Somani, M. Azizoğlu, and R. A. Barry, "A performance model for wavelength conversion with non-Poisson traffic," in Proc. IEEE INFOCOM'97, pp. 499-506, April 1997.
348. A. K. Somani and M. Azizoğlu, "All Optical LAN Interconnection with a Wavelength Selective Router," in Proc. IEEE INFOCOM'97, pp. 1278-1285, April 1997.
349. 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.
350. 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.
351. G. Krishnamurthi, A. Gupta, and A. K. Somani, "The HIMAP Modeling Environment," in Proc. of PDCS-96, Sept. 24-27, 1996, Dijon, France.
352. 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.
353. S. Subramaniam, M. Azizoglu and A. K. Somani, "Connectivity and sparse wavelength conversion in wavelength-routing networks," Proceedings of IEEE INFOCOM '96, pp. 148-155 vol.1, doi: 10.1109/INFOCOM.1996.497888.
354. 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).
355. D. Fura and A. K. Somani, "Abstract-Directed Synthesis of VHDL Test Benches," VHDL International Users' Forum, Santa Clara, CA, Feb-Mar 1996.
356. 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.
357. 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.
358. 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.

359. 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.
360. 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.
361. D. Fura and A. K. Somani, "Transaction-Level Specification of VHDL Design Models," in VHDL International Users' Forum, October 1995.
362. 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.
363. 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.
364. S. Subramaniam and A. K. Somani, "Multicasting in ATM networks using MINs," in the Proc. of ICCCN, 1995, Las Vegas, NV, 1995, pp. 142-149, Sept. 1995.
365. 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.
366. 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.
367. 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.
368. 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.
369. 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.
370. 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.
371. 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.
372. 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.
373. C. Chen and A. K. Somani, "A Unified Architectural Tradeoff Methodology," in the Proc. of Intl. Symp. of Computer Architecture 1994, Chicago, April 1994, pp. 348-357.
374. 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.
375. 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.
376. 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.

377. 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.
378. 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.
379. 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.
380. A. K. Somani, S. Palnitkar, and T. Sharma, "Reliability Modeling of Systems with Latent Failures Using Markov Chains," in the Proc. of RAMS-1993, at Atlanta, GA, pp 120-125.
381. C. M. Wittenbrink and A. K. Somani, "Permutation Warping for Data Parallel Volume Rendering," in Parallel Rendering Symposium, Visualization '93, San Jose, California, 1993, pages 57-60, color plate page 110.
382. 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.
383. A. K. Somani, "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.
384. 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.
385. C. Wittenbrink and A. K. Somani, "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.
386. 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.
387. 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.
388. 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.
389. 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.
390. 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.
391. 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.
392. 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.
393. 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.
394. M. Csoppenzsky 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.



395. S. Tridandapani and A. K. Somani, "Efficient utilization of spare capacity for fault detection and location in multiprocessor systems," in FTCS-22: The Twenty-Second International Symposium on Fault-Tolerant Computing, Boston, MA, USA, 1992, pp. 440-447, doi: 10.1109/FTCS.1992.243591.
396. 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," 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.
397. M. Harrington and A. K. Somani, "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.
398. C. Wittenbrink and A. K. Somani, "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**).
399. 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.
400. 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.
401. A. K. Somani and S. B. Choi, "On Embedding Permutations in Hypercubes," in the Proc. of the Sixth Distributed Memory Computing Conference, 1991, pp. 622-629, doi: 10.1109/DMCC.1991.633347.
402. 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.
403. A. K. Somani, J. Ritcey, and S. Au, "Phased Mission Reliability Analysis," abstract and poster presentation in the Proc. of SIGMetrics-90, May 1990.
404. A. K. Somani, "High-Performance High-Integrity Computer Systems," in the Proc. of Northcon-90, at Seattle, WA, October 1990, pp. 2-7.
405. C. Tarng, J. A. Meditch, and A. K. Somani, "Multicasting Copy Network Architecture," in the Proc. of ITC-90, October 1990.
406. 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.
407. S. B. Choi and A. K. Somani, "The Generalized Hyper-Cube," in the Proc. of ICPP-90, August 1990, pp. I/372-I/375.
408. 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.
409. A. K. Somani, "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.
410. A. K. Somani and V. K. Agarwal, "Distributed Syndrome-Decoding for Regular Interconnected Structures," in the Proc. of FTCS-19, Chicago, June 1989, pp. 70-77.
411. A. K. Somani and T. Sarnaik, "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.

412. 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.
413. 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.
414. 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.
415. 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.
416. 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.
417. A. K. Somani, V. K. Agarwal and D. Avis, "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.
418. 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.
419. A. K. Somani, V. K. Agarwal and D. Avis, "A Generalized Theory for System-Level Diagnosis," in the Proc. International Conference on Computer Design-85, Portchester, New York, November 1985, pp. 707-711.
420. 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.
421. 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.
422. 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.
423. A. K. Somani and V. K. Agarwal, "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.
424. A. K. Somani and V. K. Agarwal, "An Unsorted Dictionary Machine," in the Proc. of Canadian VLSI Conference, University of Waterloo, Waterloo, Canada, October 1983, pp. 80-83.

**Abstract Refereed Conference Proceedings/Technical Reports:**

425. A. K. Somani and T. Zhang, "Architecture and Performance Analysis of DIRSMIN: A Fault-Tolerant Switch Using Dilated Reduced-Stage MIN," ICASE Technical Report No. 95-78, November, 1995.
426. 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.
427. A. K. Somani, "High Performance Highly Reliable Computer Architecture" at the summer meeting of IFIP Working Group 10.4, Zion, IL, June 1989.
428. 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.

429. A. K. Somani and S. B. Choi, "Extra Links Interconnection Networks for Packet Switching," abstract and poster presentation in the Proc. of IPCC-90, March 1990.
430. 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.
431. A. K. Somani, "Phased-Mission Reliability Analysis," in the Proc. of HARP Workshop, July 1990.
432. 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.
433. A. K. Somani, "Phased Mission Analysis Techniques," at NASA Langley Research Center workshop on tools and techniques, Hampton, VA, February 1993.
434. 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.
435. D. Fura and A. K. Somani, "Trustability: A Dependability Measure for Systems with Fault Detection and Reporting," July 1990.
436. 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, 1990.
437. 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.
438. 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.
439. 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.
440. A. K. Somani and P. Rostykus, "A Hyper-Cube Compact Neural Networks," poster presented INNS First Annual Meeting Boston, MA in September 1988.
441. 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)
442. 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.
443. 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)
444. 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)
445. 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," inventors A. Gupta of BNR Inc. and Arun K. Somani, for USA and Canada.
2. No. 5,524,212 "Multiprocessor system with write generate method for updating caches," Inventors Arun K. Somani, Craig M. Wittenbrink, Ch, ung-Ho Chen, Robert E. Johnson, Kenneth H. Cooper, Robert M. Haralick, Issued on June 4, 1996.
3. No. 6,156,964 "Apparatus and Method of Displaying Music," Patent granted, Inventors Anil Sahai and Arun Somani, Issued on December 5, 2000.
4. No. 6,718,173 "Location Information recovery and Management for Mobile Networks," Inventors Govind Krishnamurthy and Arun K. Somani, Issued in October 2004.
5. No. 7,113,795 "Location Information recovery and Management for Mobile Networks-II," Inventors Govind Krishnamurthy and Arun K. Somani, Issued in September 2006.
6. No. 7,323,629 "Real-Time Music Recognition and Display System," Inventors Arun Somani, Wu Tao, Raed Adhami, Liang Zhao, and Anil Sahai, Issued in January 29, 2008.
7. No. 7,536,477 "Access Mechanisms for Efficient Sharing in a Network, Inventors Issued on May 2009.
8. No. 7,671,627 "Superscale Processor Performance Enhancement Through Reliable Dynamic Clock Frequency Tuning," Inventors Arun Somani and Mikel Bezdek, Issued on March 2, 2010.
9. No. 8,438,522, "Logic Element Architecture for Generic Logic Chains in Programmable Devices," Inventors Michael Frederick and Arun K. Somani, Issued on May 7, 2013.
10. No. 8,661,394, "Depth-Optimal Mapping of Logic Chains in Reconfigurable fabric," Inventors Michael Frederick and Arun K. Somani, Issued on Feb 25, 2014.
11. No. 8,902,920, "Dynamic Advance Reservation with Delayed Allocation," Inventors Vinod Vokkarane and Arun Somani, Issued on Dec 2, 2014.
12. No. Provisional Patent 10,321,888, "Wireless stethobroadcasting instrument for medical training," Inventors Nikhil Sahai, Subhash Sahai, Jr., Arun Somani, and Koray Celik, Issued on June 18, 2019.