

**JUNAID AHMED ZUBAIRI**  
**Department of Computer Science**  
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*Education*

Syracuse University	Ph. D. ( Computer Engineering )	1991
Syracuse University	M.S. ( Computer Engineering )	1987
NED University	B.E. ( Electrical Engineering )	1983

*Academic Experience*

1999 - *	Associate Professor (promoted 2002), Computer Science, SUNY at Fredonia
1996-99	Associate Professor, ECE Department, IIUM, Malaysia
1994-96	Associate Professor and Incharge, Computer Engineering Department Sir Syed University of Engineering and Technology (SSUET), Pakistan.
1993-94	Head, Computer Science Department, Aligarh Inst. of Technology (AIT), Pakistan.

Held visiting positions in Arid Agri Univ, Pakistan (2002) and IIUM, Malaysia (2000, 2005) and spent sabbatical leave in an academic position in University of Hail, Saudi Arabia (2006-08).

*Scholarly Activities*

**Technical Co-Chair** HONET'08, **Keynote Speaker** IEEE INMIC'08, **Keynote Speaker** FIT'07, **Publication Chair** CTS'07 , **Co-Chair** HONET Sept '06, **TE-Chair** 9<sup>th</sup> CNS Apr'06, **Publication Chair** CTS'06, **Session Chair** CTS'08, CTS'05, ATS'05, ATS'04, CTS'04, ATS'03, PDCS'02, SCI'01, PDCS'01, **Program Co-Chair** FIT'06, FIT'05, **International Co-Chair** HONET'05, **Co-Chair** Symposium on IP Mobility, IEEE VTC'03, **Publicity Co-Chair** FIT'03,

**Grants and Awards**

- ❖ SUNY UUP Individual Development Award '06
- ❖ Grant NSF 05-506 awarded '04 Co-PI (**\$400,000**)
- ❖ Altera University Program award 2005; 2002
- ❖ SUNY Scholarly Incentive Award 2005
- ❖ SUNY Faculty Foundation Fellowship Award 2004,
- ❖ SUNY UUP Individual Development Award 2003
- ❖ SUNY Scholarly Incentive Award 2001
- ❖ Research grant IRPA Malaysia '99, Co-PI(**\$62,000**)
- ❖ Research grant IIUM, Malaysia (Image Processing) '97 as PI

- ❖ Room, Equipment grant Biomechanics Research Lab Sir Syed University Pakistan awarded in '95 as PI.

**Referee/reviewer** IEEE Transactions on Networking, IEEE Transactions on Biomedical Imaging, IEEE Communications Magazine, Informatica Journal, International Journal of Communication Systems, International Journal of Modeling and Simulation, International Journal Of Computer Applications In Technology (IJCAT), International Journal of Network Management, Journal of Clinical Biomechanics, International Journal of Healthcare Technology and Management (IJHTM), IEEE IPSS'90, CCSCNE'2000, ATS'2001, SCI'2001, ANSS'2002, PDCS'2002, ATS'2003, IEEE GLOBECOM'2003, HP&LSC'2003, IEEE VTC'2003, IEEE ICC 2004, FIT 2003, FIT2004, HONET 2004, CTS 2005, FIT 2005, ACS/IEEE AICCSA-07.

**Member Editorial Board** TEKNOLOGIX journal, **Member International Advisory Board** Indus Journal of Management & Social Sciences (IJMSS), **Member of Alpha Sigma Chapter** of PHI BETA DELTA, Honor Society for International Scholars in USA, **PEC** (Pakistan Engineering Council), **Member IEEE** (Institute of Electrical and Electronic Engineers, USA) including **IEEE Computer Society**.

### *LIST OF PUBLICATIONS*

#### **BOOK CHAPTERS**

- J. Zubairi, **“Voice over IP and MPLS”**, Chapter 92, Volume II, “Handbook of Computer Networks”, Editor Dr. Bidgoli (*Published 2007, ISBN-10: 0-471-78461-3, ISBN-13: 978-0-471-78461-6 - John Wiley & Sons*)
- J. Zubairi, **“Emerging Methods for Voice Transport over MPLS”** accepted in VoIP Handbook: Applications, Technologies, Reliability, and Security to be published by Taylor & Francis Group, New York, USA.
- J. Zubairi, S. Misbahuddin and I. Tasadduq, **“Emergency Medical Data Transmission Systems and Techniques”**, accepted in Handbook of Research on Advances in Health Informatics and Electronic Healthcare Applications : Global Adoption and Impact of Information Communication Technologies to be published by IGI Global Publishers (<http://www.igi-pub.com>) in 2009.

#### **JOURNALS**

- J. Zubairi and N. Bahbooh, **“Novel Schemes for Traffic Engineering in Access Domains”**, Wiley International Journal of Network Management, Vol. 17 , Issue 1 (Jan'07), Pages: 69 – 83, ISSN:1099-1190.
- J. Zubairi, **“An Overview of Optical Network Bandwidth and Fault Management”** IIUM Malaysia Engineering Journal, Vol 7, No.1, 2006, Pages 47-69, ISSN 1511-788X.

- J. Zubairi, M. Elshaikh and O. Mahmoud, "**A Study of VBR Traffic Treatment in a Diffserv Domain**" International Journal of Modeling and Simulation, Vol. 23 Issue #3, 2003, Pages 187-193.
- J. Zubairi and W. Al-Khateeb, "**MPLS: Managing the New Internet**" Bulletin of Institution of Engineers Malaysia, BIL.2003, No.12, December 2003, Pages 30-38.
- M. Jaseemuddin, J. Zubairi and O. Mahmoud, "**A Study of Profiled Handoff for DiffServ-Based Mobile Nodes**" Wiley's Wireless Communications and Mobile Computing Journal, June 2002, Pages 339-356.
- J. Zubairi, "**Applications of Computer Aided Rasterstereography in Spinal Deformity Detection**" Image and Vision Computing Journal, Vol. 20, Issue 4, April 2002, Pages 319-324.

### PERIODICALS

- J. Zubairi, "**Linux in Kuala Lumpur**", Linux Journal, SSC, issue 66, October 1999, Pages 26-28
- J. Zubairi, "**An Overview of Wide Area Networking in Pakistan**" in Education News and Views, Oct-Dec 1995, Pakistan, Pages 3-7.

### CONFERENCE PROCEEDINGS

- J. Zubairi, "**Voice Transport Techniques Over MPLS**", Proc. 5<sup>th</sup> High Performance Optical Networking Symposium (HONET 2008), Nov 2008.
- J. Zubairi, "**Current Practices for MPLS Protection**", Proc. 4<sup>th</sup> High Performance Optical Networking Symposium (HONET 2007), Nov 2007.
- J. Zubairi and I. Tasadduq, "**OPNET Based Evaluation of Aggregated Medical Data Transmission over UMTS for Disaster Sites**" Proc. OPNETWORK '07, Aug 2007.
- J. Zubairi, T. Mubeen and I. Tasadduq, "**Handoff issues in 3G UMTS Networks**", International Bhurban Conference on Applied Science & Technology (IBCAST), 8-11 January, 2007.
- J. Zubairi, I. Tasadduq and T. Mubeen, "**Wireless Admission Control Effect on Handover Nodes**", Proceedings OPNETWORK 2006, Aug-Sept. '06 Washington DC, USA..
- M. Ahmed, J. Zubairi et. al., "**Smart Automated Disinfection System to Counter Worm Propagation in Small Networks Using 'Honeypot' Framework**" Proc. 9<sup>th</sup> CNS '06 Huntsville, AL, USA.
- J. Zubairi, "**Building Reliable Optical Networks with Efficient Protection Schemes**", *invited paper*, NSF Sponsored HONET'05 Symposium, Dec '05
- J. Zubairi, "**Traffic Engineering Fault Management for Optical Networks**" *invited paper* in NSF-sponsored International Workshop on High Speed Optical Networks and Enabling Technologies (HONET'04)
- N. Bahbooh and J. Zubairi, "**An Algorithm for DF Trunk Splitting to Enhance Bandwidth Utilization**" in Proc. HONET'04.

- J. Zubairi, "**Challenges and Issues in Global Collaborative Networking**", *invited* paper in Collaborative Technologies Symposium, part of WMC 2004, January 2004 San Diego, USA.
- N. Bahbooh and J. Zubairi, "**Multipath Routing in an MPLS Domain**" in Proc. ATS'04, April 2004 Arlington Virginia, USA.
- J. Zubairi, "**Networking for Tomorrow**", *invited* paper in proceedings of NSF sponsored Information Technology Workshop, December 2003, Islamabad, Pakistan.
- J. Zubairi, "**A Comparative Study of Constrained Routing of Label Switched Paths With Shortest Distance Algorithm and TELIC**" Proc. Applied Telecommunication Symposium (ATS) , Pages 17-22, March 2003, Orlando, USA.
- J. Zubairi, "**An Automated Traffic Engineering Algorithm for MPLS-Diffserv Domain**" Proc. Applied Telecommunication Symposium (ATS) , Pages 43-48, San Diego, April 2002.
- J. Zubairi and J. Greutman, "**Evaluating Deployment Of Centralized Core Server And Mobile Web Clients**" in Proc. online OPNETWORK2001, Aug 2001, Washington DC.
- M. Jaseemuddin, O. Mahmoud and J. Zubairi, "**Effect of Context Transfer during Handoff on Flow Marking in a DiffServ Edge Router**" Proc. SCI'2001, Vol. XII, Pages 87-92, Orlando, July 2001.
- J. Zubairi, M. El-Shaikh and O. Mahmoud, "**On Shaping and Handling VBR Traffic in a Diffserv Domain**" ATS, Simulation Series, Vol. 33, No. 3, Pages 10-15, April 2001, Seattle.
- S. Al-Irhayim, J. Zubairi, M. Qahhar and S. Abdul Latif, "**Issues in Voice Over MPLS/Diffserv**" in Proc. PDCS'2000, Volume II, Pages 467-472, November 2000, Las Vegas.
- J. Zubairi and M. Zuber, "**SUNY Fredonia Campus Network Simulation And Performance Analysis Using OPNET**" in Proc. online OPNETWORK2000, Aug 2000, Washington DC.
- K. Siddiqui and J. Zubairi, "**Distance Learning Using Web-Based Multimedia Environment**" in Proc. IEEE/ACM International Conference on Next Generation Enterprises: Virtual Organizations and Mobile / Pervasive Technologies, AiWORC'00, Buffalo, NY, April 27-29, 2000.
- J. Zubairi and A. Jantan, "**ATM-Ethernet Network Performance Analysis**" in Proc. IEEE National Conference on Telecommunication Technologies, Universiti Putra Malaysia, Kuala Lumpur, Malaysia, Dec 1998, Pages 25-28.
- J. Zubairi, S. Al-Irhayim, W. Al-Khateeb and Y. Wajdi, "**Performance Analysis and Comparison of PTOP and LANE for IP Transmission Over ATM Network**", in Proc. SPIE Conference on Quality of Service Issues Related to the Internet, Boston, Volume 3529, Nov 1998, Pages 187-193.
- J. Zubairi and A. Kamal, "**Surface Type Recognition Using Deviation Templates**" in Proc. IEEE Intl' Conference on Intelligent Engineering Systems" Vienna, Austria, Sept. 1998, Pages 375-378.

- S. Al-Irhayim, J. Zubairi and W. Hassan, "**ATM Deployment Issues In A Broadband Heterogeneous Campus Wide Network**" in Proc. IEEE Malaysia International Communication Conference (MICC) and ISPACS, Kuala Lumpur, Malaysia, November 1997, Pages S14.3.1-S14.3.6.
- J. Zubairi and A. Kamal, "**A Methodology for Spinal Deformity Detection Using Rasterstereography**" in Proc. of 1997 IEEE ICIPS, October 1997, Vol. 2, Pages 1528-1531.
- M. YousufZai, S. Kamal and J. Zubairi" **Computer Based Analysis of Human Gait Using Moiré Fringe Topography**" in Proc. Intl' Wkshp on Computer Vision and Parallel Processing, IEEE and Quaid-e-Azam University, Islamabad, Pakistan, January 1995, Pages 60-71.
- J. Zubairi, "**The Design and Implementation of Local Area Network in Sir Syed University**" in Proc. IEEE Conference on Networking, Karachi, Pakistan, September 1994, Pages 8-13.
- J. Zubairi, "**Image Processing Algorithms to Detect Trunk Deformities**" in Proc. South-East Asia Regional Computer Conference (SEARCC' 94), November 1994, Karachi, Pakistan, Pages 270-279.
- J. Zubairi, "**INTERNET : The Network of Computer Networks**" in Proc. Pakistan Navy Engineering College Technical Seminar, Karachi, Pakistan, June 1993, Pages 76 -85.
- J. Zubairi and G. Craig, "**A Bottom Up Methodology to Characterize Delay Faults**" in Proc. IEEE Intl' Wkshp on defect and Fault Tolerance on VLSI Systems, November 1991, (DFT' 91), Pennsylvania, USA, Pages 183 - 186.

### CONFERENCE PRESENTATIONS AND REPORTS

- J. Zubairi, "**Voice over MPLS Techniques**", Keynote presentation, 12<sup>th</sup> IEEE INMIC Dec 2008.
- J. Zubairi, "**Emergency Medical Data Transmission Over Cellular and Wireless Networks**" invited presentation, FIT'08, Dec 2008.
- J. Zubairi, "J. Zubairi, "**VoIP Enabling Technologies and Deployment Opportunities**", *Keynote Presentation*, 5<sup>th</sup> Int'l Workshop on Frontiers of Information Technology, (FIT2007) Dec 2007.
- J. Zubairi, "**Enhancing Operating Systems Education with Programming Labs**" CIT 2006 (Conference on Instructional Technologies) May '06 SUNY Fredonia, USA.
- J. Zubairi and I. Tasadduq, "**Admission and Handover Issues in Wireless Networks**" *invited paper*, FIT'05, Dec '05
- J. Zubairi, "**Issues in Network Bandwidth Management and Traffic Control**" *invited talk* in second NSF sponsored International Workshop on Frontiers of Information Technology, Dec 2004
- J. Zubairi, "**Summer Visiting Faculty Observations and Impressions**" in 20<sup>th</sup> Annual APSENA Conference, Aug 2003, SUNY at Albany, USA
- K. Siddiqui and J. Zubairi, "**Online Asynchronous Learning of Information Technology**" in CIT2001, May 2001 at SUNY Geneseo.

- J. Zubairi, "**Installing and Using OpenGL API and PVM**", Technical Report No. ECE/TR-01/98, Department of Electrical and Computer Engineering, International Islamic University Malaysia, December 1998.
- J. Zubairi, "**Surface Shape Recognition and Applications Using Computer Aided Rasterstereography**" Research Report, University Research Center, International Islamic University Malaysia, December 1998.
- J. Zubairi and T. Pervez, "**Development of Industry Linked Postgraduate Education in Engineering**" in RESPEC'97 (Regional Seminar on Postgraduate Education) Universiti Teknologi Malaysia, Johor Bahru, Malaysia, Sept. 1997.
- J. Zubairi, "**Implementation and Comparison of Range Image Segmentation Schemes**" in IEEE Conference on Information Technologies - Towards 2000, Karachi, Pakistan, May 1993.
- J. Zubairi, "**A Heuristic Scheme for Guidance of Delay Fault Test Pattern Generation**" in IEEP's 11th Multitopic International Symposium, Karachi, Pakistan, February 1993.
- J. Zubairi, "**Fault Analysis**" in IEEE Conference on Computers and Applications Karachi, Pakistan, May 1992.

### ***PROFESSIONAL EXPERIENCE***

I have approximately 4-5 years of experience serving as Director of Computer Labs, Computer Coordinator, Systems Manager, Assistant Engineer, Senior Engineer and Software Analyst. A list of professional jobs held in chronological order can be found at <http://www.cs.fredonia.edu/~zubairi/webprof.html>.

### ***ASIC and FPGA Related Experience***

I am knowledgeable about ASIC design with front-end and back-end tools. I used layout tools for several VLSI layouts and front-end tools for synthesis and developed an integrated package (IDFA) to analyze the chip designs for delay faults. I planned and established ASIC design facilities based on front-end design tools from Synopsys, FPGA tools from Altera and back-end layout tools consisting of MAGIC and SPICE. Following are some relevant projects that I worked on:

- Implementation of GLITTER, a gridless channel router in VLSI chips
- Design of a scan test generator for LSSD VLSI chips in C
- Design of an expert system for circuit drawing in PROLOG
- VLSI design of several combinational logic circuits
- Design of IDFA, a VLSI chip fault analysis tool for delay fault analysis

### ***Network Related Experience***

I have worked on several topics in network performance and protocols. Some of the projects include:

- Dealing with handoff issues for mobile IP nodes
- Shaping VBR traffic for diffserv domains to reduce congestion
- Simulation of departmental and campus networks for performance analysis
- Design of TE-compliant LSP selection scheme for MPLS domains

I have extensive experience in designing, advising, managing and supervising local area networks and campus wide networks including shared Ethernet, switched Ethernet and Ethernet-ATM networks in lead positions.

***Other Professional Skills and Expertise***

I have worked on a variety of computing platforms including supercomputers and parallel processors. I have a rich background of programming languages including C++/C, Pascal, PROLOG, LISP, VHDL, FORTH and C\*. I have used Labview, Synopsys, Altera Max+plusII, Xilinx Project Manager, PVM, GLUT, X-Windows, Latex, MAGIC, SPICE, NS and OPNET.

Other projects that I have worked on:

- Design and development of a microprogrammed computer and a moving LED display
- Simulation of a task scheduling algorithm in Pascal
- Development of a simulator of a SIMD machine in C
- Implementation of range image segmentation schemes in C
- Enhancing Performance of LU decomposition on hypercube
- Designing computer interface and its software for telemetry system
- Worked on IEEE 488 (GPIB) interface for antenna positioner system & enabling its software control
- Revitalizing the servo system of specialized optical tracking equipment
- Consultancy for M/S Siemens to resolve operational problems in an on-board computer on a vehicle
- Software to acquire and process data in real time for applications in clinical research (C/Labview)

## Statement of Research and Teaching Interests

### *Research Interests*

Currently I am working on topics in network protocols, network performance evaluation and network applications. I supervised several undergraduate and graduate students on projects and theses related to Diffserv, Wireless and MPLS. A partial list of my students and their projects can be found at <http://www.cs.fredonia.edu/~zubairi/research.html>. I was awarded a major research grant (IRPA, Malaysia) and another grant (SUNY Fredonia) in topics related to network protocols. I developed an algorithm known as TELIC (implemented in C++) for routing label switched paths in a domain. I defined conjunction factor as a figure of merit for evaluating and comparing routing algorithms in an MPLS domain. The work with graduate students resulted in publication of two papers in refereed journals. This work was concerned with quality of service issues in traffic handling in the Diffserv domains for static and mobile nodes. Recently, I defined a project to develop MEDTOC (MEDical Data Transmission Over Cellular networks). I worked with two colleagues to define the aggregated packet formats and determine the bandwidth needed to carry vital signs of several patients over a single UMTS link to the hospital. We performed OPNET simulations to demonstrate the successful transmission of medical data to the hospital through a heavily used 3G network. I am co-supervising a PhD student on this project. We have written a chapter about emergency medical data transmission techniques that has been accepted in IGI Global handbook to be published in 2009.

My doctoral research was on the analysis of delay faults in CMOS VLSI circuits. I implemented IDFA (Inductive Delay Fault Analyzer), a software tool that worked with the VLSI layout, extraction and simulation tools. IDFA introduced localized defects into the layout. The timing behavior of the circuit was analyzed and statistical analysis of the delay faults resulting from the simulated defects was performed. I also developed an algorithm to provide guidance for delay fault testing aimed at optimizing the fault coverage of testing schemes using the results of IDFA.

### *Teaching Interests*

I have offered a wide range of courses including **Software Engineering, Operating Systems, Computer Graphics, Computer Architecture, Fault Tolerant Computing, Data Communications and Networks, Computer Science-I** (Introductory C++), **Computer Science-II** (C++ with data structures), **Java Programming** and **Computer Science Overview**. I have also offered graduate level courses including **System Analysis and Design** and **Real-Time Systems**.

In all of my courses, I enjoy working with the students and providing opportunities for assessment and evaluation of my teaching. Teaching evaluations for several semesters are available online at <http://www.cs.fredonia.edu/~zubairi/evals.html>. I attended some pedagogical workshops and learned a number of techniques to make the classroom an interesting place. I use one such technique known as “active learning” regularly. In active learning, students participate in the lecture and remain active throughout the time. Active learning includes mini-lectures and revision, group and individual worksheets, question-answer sessions and case studies. I am interested in development of syllabi and distance learning programs. I designed the complete curriculum of Bachelor of Computer Engineering program in Sir Syed University Pakistan. I have designed syllabi of some graduate level courses for the planned Master of Computer Science program in SUNY Fredonia. I maintain extensive websites for my courses and post announcements, lectures, assignments, study guides, performance charts, exam solutions, diagrams and helpful links on the web. My course websites are regularly used and appreciated by the students.

## Names of References

Dr. Mohsen Guizani, Professor and Chair  
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