Zartash Afzal Uzmi
Associate Professor

zartash@stanfordalumni.org
zartash@lums.edu.pk

Computer Science and Engineering
Lahore University of Management Sciences (LUMS)
D.H.A., Lahore Cantt. 54792 Pakistan
Off: +92 (42) 572-2670 to 79 (10 lines) ext: 4425
Cell: +92 (333) 516-7230

Education:

Ph.D. Electrical Engineering (June 2002)
Stanford University, Stanford, CA
Thesis: Simplified Multiuser Detection for CDMA Systems
Specialization: Wireless and Computer Networks

M.S. Electrical Engineering (June 1996)
Stanford University, Stanford, CA
Specialization: Telecommunications

B.Sc. Electrical Engineering (May 1992)
University of Engineering and Technology, Lahore
Specialization: Electronics and Communications

Current Research Interests:

- Algorithms for Reliability in High Speed Communication Networks
- Modeling Multi-hop Cellular Wireless Communications
- Routing and Preemption in Wide Area Networks
- IP Route Aggregation
- Protocol and System Design for Wireless Networks
- Signal Processing for Communications and Video Coding

Academic and Professional Distinctions:

- Overall first position (Rank 1) throughout undergraduate education
- Recipient of 1993 S&T scholarship for graduate studies awarded to top five students in the country
- Excellence in Research award 2006, CS department, LUMS
- Excellence in Research award 2007, CS department, LUMS

Job Experience:

Lahore University of Management Sciences (07/2002 – present)
Position: Associate Professor (July 2005 – present)
Assistant Professor (July 2002 – June 2005)
Teaching, research, and program and institution development

Chonbuk National University (01/2006 – 03/2006)
Visiting Professor, Advanced Communications and Networks Laboratory
Research – Performance evaluation of Optical Burst Switching Networks
Develop and oversee research collaborations between LUMS and CNU

Brience Inc., San Francisco, CA (03/2000 – 03/2002)
Position: Product Architect
Architecture, design, and development of a platform for performing transformation of web content based on the device requesting the content. Design and development of

a bandwidth measurement module. Design and development of a protocol to perform synchronization of a handheld device with a server.

Nokia Research Center, Sunnyvale, CA (06/99-08/99)
Position: Senior Research Intern
Evaluated various architectures for content-based networking. Proposed an algorithm that adds a DNS resource record to facilitate routing a request to the best server in a geographically distributed server environment. This work was published in IEEE ICC 2001.

Bell-Labs Research (Lucent Technologies), Murray Hill, NJ (06/98-12/98)
Position: Consultant Researcher (Wireless Research Laboratory)
Pursued research in WCDMA systems. Analyzed and simulated a multiple antenna system in MATLAB. Proposed a new multiuser detection scheme, based on sub-symbols, for CDMA system. Performed a simulation analysis of the sub-symbol based multiuser detection scheme in MATLAB.

Hewlett Packard Company, Cupertino, CA (06/97-12/97)
Position: Telecommunications Engineer (Intern)
Evaluation of a system that used cable modems for end users in an LMDS backend. Responsible for setting up the system and evaluating the effect of frequency shift on the throughput of the system.

Pakistan Telecom Corporation, Islamabad, Pakistan (06/93 – 08/94)
Position: Assistant Divisional Engineer

Publications:

S. M. Ilyas, A. Nazir, F. S. Bokhari, Z. A. Uzmi, A. Farrel and F. R. Dogar "A Simulation Study of GELS for Ethernet over WAN," IEEE Globecom 2007

B. Anjum and Z. A. Uzmi "Multi-Class QoS in 802.11 Networks using Gentle Decrease of Multiple Contention Windows," IEEE Globecom 2007

F. Aslam, Z. A. Uzmi and A. Farrel, "Inter-Domain Path Computation: Challenges and Solutions for Label Switched Networks," IEEE Communications Magazine, vol. 45, no. 10, pp. 94 – 101, October 2007

A. Mahmood, Z. A. Uzmi and S. Khan, "Video Coding with Linear Compensation," IEEE ICC 2007

F. Aslam, Z. A. Uzmi, A. Farrel and M. Pioro, "Inter-Domain Path Computation using Improved Cranckback Signaling in Label Switched Networks," IEEE ICC 2007

F. R. Dogar, L. Aslam, Z. A. Uzmi, S. Abbasi and Y.-C. Kim, "Connection Preemption in Multi-class Networks," IEEE Globecom 2006

M. Ali, Thiemo Voigt and Z. A. Uzmi, "Mobility Management in Sensor Networks," Int. Conf. on Dist. Computing in Sensor Networks (DCOSS 2006), MSWSN Workshop

F. Aslam, S. Raza, Z. A. Uzmi, and Y.-C. Kim, "Bandwidth Sharing with Primary Paths for Protection Routing in an MPLS Network," Global Internet Workshop of the IEEE Infocom 2006

M. Ali, U. Saif, A. Dunkels, T. Voigt, K. Romer, K. Langendoen, J. Polastre and Z. A. Uzmi, "Medium Access Control Issues in Sensor Networks," ACM SIGCOMM CCR, vol. 36, no. 2, pp. 33-36, April 2006

M. Ali and Z. A. Uzmi, “A Mobility-Adaptive Energy-Efficient MAC Protocol for Wireless Sensor Networks,” International Journal of Sensor Networks, vol. 1, no. 3, pp. 134-142, 2006

S. Raza, F. Aslam, S. M. Baqai and Z. A. Uzmi, “Seamless Detection of Link and Node failures in Label Switched Networks with Local Restoration,” Proceedings of the National Conference on Communications (NCC), New Delhi, India, 2006

F. R. Dogar, S. M. Baqai and Z. A. Uzmi, “CAIP: A Restoration Routing Architecture for DiffSev Aware MPLS Traffic Engineering,” Proceedings of DRCN 2005

S. Raza, F. Aslam and Z. A. Uzmi, “Online Routing of Bandwidth Guaranteed Paths with Local Restoration using Optimized Aggregate Information,” IEEE ICC 2005

W. Mateen, S. Raza, Z. A. Uzmi and S. M. Baqai, “Adaptive Multi-path on demand routing in mobile ad hoc networks,” IEEE International Symposium on Object-Oriented Real-time Distributed Computing (ISORC), May 2005

M. Ali, T. Suleman and Z. A. Uzmi, “MMAC: A Mobility-Adaptive Collision-Free MAC Protocol for Wireless Sensor Networks,” Proceedings of IPCCC (IWSEEASN) 2005

F. Aslam, S. Raza, F. R. Dogar, I. U. Ahmad and Z. A. Uzmi, “NPP: A Facility Based Computation Framework for Restoration Routing using Aggregate Link Usage Information,” Proceedings of QoS-IP 2005

H. Naveed and Z. A. Uzmi, “Performance Comparison of Ad Hoc Wireless Network Routing Protocols,” Proceedings of IEEE INMIC 2004

S. Raza and Z. A. Uzmi, “The Pipeback Switch: High Performance Packet Switching with Guaranteed Delivery and Linear Buffer Complexity,” Proceedings of ATNAC 2004

A. Karim, S. I. Jami, I. Ahmad, M. Sarwar, and Z. A. Uzmi, “Clustering IP Addresses Using Longest Prefix Matching and Nearest Neighbor Algorithms,” Proceedings of PRICAI 2004

M. Ali and Z. A. Uzmi, “An Energy Efficient Node Address Naming Scheme for Wireless Sensor Networks,” Proceedings of IEEE INCC 2004

M. Ali and Z. A. Uzmi, “Serving Dynamic Queries in Wireless Sensor Networks,” Proceedings of CNSR 2004

Barani Subbiah and Zartash Uzmi, “Content aware networking in the Internet: Issues and Challenges,” Proceedings of IEEE ICC 2001

Z. A. Uzmi and M. J. Narasimha, “Maximizing System Capacity in a Sub-Symbol based DS-CDMA Multiuser Detector,” Proceedings of IEEE Globecom 2000

Z. A. Uzmi and S. A. Mujtaba, “A Novel Scheme for Linear Multiuser Detection in Asynchronous CDMA systems with Frequency Selective Fading,” Proceedings of IEEE Globecom 1999

Z. A. Uzmi and S. A. Mujtaba, “Performance Analysis of a Convolutionally Encoded Synchronous CDMA System with Adaptive Beamforming and Linear Multiuser Detection”, Proceedings of ASILOMAR Conference on Signals, Systems, and Computers, 1999

Book Chapters:

- Digital Phase Modulation in A handbook of Computer Networks, Wiley 2007
- Bridges in A handbook of Computer Networks, Wiley 2007

Technical Reports:

- Linear Multiuser Detection with Beamforming in DS-CDMA Systems: Performance Analysis, Bell-Labs Technical Memorandum, 1998
- Equivalence of Clo's type architecture and the Speedup problem for a multicast switch, 1997
- A survey of position location methods in wireless cellular networks for E911 Services, 1996
- Study of digital network synchronization and performance evaluation of different synchronization techniques, 1995

Professional Service:

Technical Program Committee, IEEE Globecom 2008, IEEE INCC 2008, SmarTel 2007, ICCCN 2007, IEEE Globecom 2006, IEEE INCC 2004

Technical Program Chair, IEEE INCC 2008

Chief Organizer, IEEE INCC 2008, IEEE INCC 2004

Vice Chair, IEEE Lahore Section (2006-2007)

Secretary, IEEE Lahore Section (2004-2005)

Founding Chair, IEEE Comm. Society Chapter (Lahore Section) (2003-2006)

IEEE Student Branch Counselor (2003 and 2004)

Computer Skills:

- Programming experience in C/C++ and Java on various platforms including Windows, Unix/Linux, PalmOS, and Pocket PC.
- Ability to model and develop large simulators and other programming projects in Matlab, C/C++, and JAVA.
- Clear understanding of Enterprise networks and software
- Well-versed with the state of the art web technologies
- Hands-on experience with local and wide area networks gained through employment as Resident Computer Coordinator (RCC) for 44 buildings from 1997 to 2001 in residences at Stanford University.

Teaching Experience:

On LUMS Faculty since July 2002. Taught following courses:

- Network Protocols and Standards
- Computer Networks
- Information Theory
- Analog and Digital Communications
- Topics in Internet Research
- Advanced Programming Techniques
- Probability

Class web addresses and course materials are available upon request.

Occasional lecturer and teaching assistant for various courses at Stanford University (1996-2002) including Digital Transmission, Digital Switching, and 2D Imaging.

Students and Groups Supervised:

Five M.S. projects and thesis during academic years 2002-2007:

- A Fresh Look at IP Routing Lookups using Route Aggregation
- Performance comparison of routing protocols for ad hoc networks
- Combined input-output queuing: simulation and complexity analysis
- Minimum transmission energy (MTE) routing in wireless sensor networks
- Evaluation of many-to-one schemes for routing locally restorable bandwidth guaranteed paths in MPLS networks

External Research Grants:

2003-2004 Principal Investigator, IP and MPLS Traffic Engineering: Protection Algorithms. Cisco Systems, San Jose, CA.

2003-2004 Co-Principal Investigator, Image Registration based Navigation. National Engineering and Scientific Commission, Pakistan.

2004-2005 Co-Principal Investigator, Fault Tolerant TCP for Reliable Routing using Open Source Software. Pakistan Telecom Company Limited R&D fund.

2005-2007 Co-Principal Investigator, Integration of NMS and GIS Systems for telecom network deployments in Pakistan, PTCL R&D Fund, US$300K

References:

Syed Mansoor Sarwar, Professor and Principal, PUCIT (principal@pucit.edu.pk)
Shahab Munir Baqai, Associate Professor, LUMS (baqai@lums.edu.pk)

These are the people I have worked with most recently. Additional references are available on request.