

## **Dr. Sayeed Ghani**

Associate Dean, Faculty of Computer Science, IBA, Karachi  
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### **Education:**

#### ***Columbia University, USA: 1984-1989.***

- Ph.D. in Electrical Engineering /Telecommunications, February 1990. GPA 3.9/4.0. Advisor Prof. Mischa Schwartz. Courses include Circuit Switching, Switching Theory, Stochastic Control, Detection and Estimation of Random Phenomena, Linear Programming, Combinatorial Optimization, Queuing Theory, Distributed Algorithms, and Numerical Methods.
- M.S. in Electrical Engineering, January 1986. GPA 3.7/4.0. Courses include Computer Communications Topics in Computer Communications, Stochastic Processes, Linear Systems, Digital Communications, Digital Image Processing, Operating Systems, and Analysis of Algorithms.

#### ***Massachusetts Institute of Technology (MIT), USA: 1980-1984.***

- B.S. in Electrical Engineering, June 1984. GPA 4.5/5.0. Courses include Digital Signal Processing, Solid State Circuits, Real Time Computing and Control Lab., Digital Systems Lab., Management of Information Technology, PASCAL, LISP & C, Operating Systems.

#### ***Karachi Grammar School, Pakistan: 1967-1980.***

- A-Levels. Mathematics (A), Pure Math(A), Biology(C)
- O-Levels. Math, Physics, Chemistry, Biology, English Language, Urdu, English Literature, Economics. Grade 11 points

## **Work Experience:**

### **Institute of Business Administration, Karachi, October 2001 – To Date**

*Associate Dean, Faculty of Computer Science*

The Center for Computer Studies at IBA presently offers MBA(MIS), BS(Computer Science) and BBA(MIS) degrees. The department has a total of about 350 students. Responsibilities include: expansion of the Center to cater for the newly developed four-year programme, development and redesign of the entire curriculum, infrastructure development and expansion. In addition to the development of a proper IT infrastructure for IBA, hiring of permanent full time faculty for the department, and establishment of a proper ERP system throughout IBA has been undertaken. *Also served as Member IBA Board of Governors from 2002-2007.*

During the last seven years major improvements in the infrastructure have been accomplished including establishment of a state-of-the-art IT infrastructure and high-speed Internet for the two campuses and IBA hostels.

New centralized applications have also been developed and launched within IBA including a Campus Management System (CMS), Fee Management System (FMS), Library Management System (LMS), Online Admission System (OAS), Online Course Registration System (OCRS), IBA Research Portal (IRP) and an alumni database. Additionally an IBA portal giving access to all such facilities and a constantly improving IBA website have also been developed during this period.

Curriculum revisions and improvements included: A new four-year curriculum for BS(CS) and BBA(MIS) degrees; redesign of the two-year MBA(MIS) degree and launch of a PhD program in MIS/Computer Science/ICT in August 2005. A total of 6 new courses (5 at the PhD level and one at undergraduate level) have been introduced and taught by myself. In addition a completed new curriculum has been introduced by the department at the PhD level.

### ***Current Research Interests***

Research and Teaching interests include simulation and performance analysis of wireless networks, Wireless Sensor Networks, routing in Mobile Ad-hoc Networks and LTE Networks. Currently actively supervising 4 out of the 9 enrolled PhD students in the department.

### **NewCore Networks, Inc. , Karachi, May 2000 – June 2001**

*Director, Telecommunications*

Founding member of NewCore Networks, a California, USA based company, whose mission is to become the leading provider of third-generation switching solutions to satisfy the explosive demand created by the accelerating convergence of telecommunications and data networking. As Director Telecommunications, responsible for the design and architecture of a Next Generation Asynchronous Mode Transmission (ATM) switch that provides common switching and gateway facilities for multimedia (Voice, Data, and Video) traffic. Interconnectivity to the Internet, ATM networks and legacy SS7 Class 4/5 voice switches is an essential component of the design. Also

involved in the development of a Service Creation Environment for Operational Systems Support, Maintenance and Service Provisioning. Responsibilities include:

- Subject Matter Expert on Voice Signaling (SS7, GR-303, Q.931, etc.) Aspects.
- Contribute in the Hardware design of the NewCore Switch, based on Reconfigurable Communications Processors (RCP), voice codecs (G.726, G.723, among others)
- The Newcore networks switch is designed to accommodate 50,000 – 400,000 voice channels, using a high density, scaleable architecture.
- Develop a 3G Wireless Architecture of the NewCore Switch.
- Management of the Software project building the Service Creation Environment.

### **State Life Insurance Corporation of Pakistan, Karachi, July '99 – April 2000.**

*Consultant & Divisional Head, Computer Division*

State Life Insurance Corporation (SLIC) is the largest Insurance Corporation of Pakistan, with over 40 zonal offices throughout Pakistan, and servicing a field force of over 150,000 agents and over 4 million policy holders.

#### **Responsibilities:**

- Responsible for Managing a Computer Division with over 100 Staff and Officers in Computer Division throughout Pakistan. Zonal offices computerized with RISC 6000 and Intel based Unix platforms with a user base of 6000 officers and staff.
- Responsible for all Software Development and Technology.
- Successfully managed transition of SLIC into the Year 2000, with in-house software compliance of legacy systems.
- Also managed the Y2K project out-sourced to CresSoft Corporation, Pakistan's largest software corporation. This project comprised of over 25 software developers working on Oracle RDBMS and Cobol to Oracle conversion, covering over 14 major enterprise wide applications including: Accounting, Commission, Billing, Receipting, Policy Holder Services, New Business, Over Seas business (including Dubai).
- New projects that were explored included complete company wide automation plans with Wide Area Networking using VSATs, Metropolitan Area Networking using Radio Modems, and large scale software development using latest Oracle development tools and Internet/Intranet networking.

### **Acsys Limited, Karachi, 1994 – July 1999.**

*General Manager Engineering & Technology*

Acsys Limited is a leading Internet Service Provider (ISP) (*CyberAccess*) and Wireless and Satellite Data Communications Company in Pakistan.

#### **Responsibilities:**

- As first Project Manager of the Company, and first employee, helped develop the Company from ground up, including all hiring of technical employees, structuring of the company and development of new business avenues.

- Chief architect of all networks & software deployed by Acsys Limited. Responsible for Design, Development, Pre Sales & Post Sales Support, Installation, and Maintenance of overall company projects.
- Managed the complete setup of *CyberAccess*, Acsys Limited's Online Internet Service. Including complete development and deployment of various Unix and NT based servers such as: Terminal Servers, DNS, Mail, Web, Billing, and Game servers, and managed direct Satellite services (Zaknet).
- Marketed the Company to the majority of the Pakistani Industry, including Multinationals, Pharmaceuticals, Airlines, Banks, Financial Institutions, News/Media Agencies, Defense, etc. Provided Pre and Post Sales Support as well as consulting services.
- Prepared detailed networking proposals and worked on Request For Proposals (RFPs) and responses to RFPs for majority of Pakistani Banks and Multinationals on networks involving both Voice and Data networks. Designs included detailed proposals and working knowledge of Frame Relay, TCP/IP, ISDN, X.25, Internet, Intranet, PBX, LANs, VSAT and Radio modem based networks.
- Evaluated various technical projects such as TDM/TDMA VSAT Networks, Trunked Mobile Radio Systems, and Global Positioning Systems.
- Received training on TDM/TDMA VSAT network in Atlanta, USA, Jan-March 1996. Also visited various International sites for TDM/TDMA VSAT network evaluation.

#### **Networking Projects:**

- Installed and Managed Largest VSAT and wireless network in Pakistan for Askari Commercial Bank Limited, comprising of a network of VSATs and Radio Modem Networks, integrating the Banks entire network of branches country-wide, and Automatic Teller Machines (ATMs).
- Overall responsibility for deployment of various networks including ICI, Reckitt & Colman of Pakistan, Clariant, Burshane, Mobil, Associated Press of Pakistan (APP), and DHL among others.
- Worked with most leading communications equipment brands such as Cisco, 3Com, Singapore Technologies, Comstream, Wireless Inc., Cylink, as well as service providers including MCI, AT&T, and Hughes.

#### **Software Related Projects**

- Developed *Graphical Online Monitoring System* for monitoring Acsys' deployed networks including ACBL and CyberAccess using *MS Access* and *Turbo Pascal*. Extensively used *Visual Basic*.
- Responsible for all Microsoft NT deployments and installation of VPN based Internet services both in-house and at Customer sites, including Pakistan Petroleum Limited (PPL), Premier Systems, MCR (Pizza Hut), and others.

- Development of *CyberAccess* Web site, including writing of html code in Active Server Pages, CGI scripts, and integration with MS Access Database.
- Deployment of Microsoft and related products for the Local Area Network, including MS BackOffice products such as Exchange Server, Internet Information Server, RAS, SMS, SQL server and competing products such as Active Server Pages, Mdaemon, Wingate, and POP3 Gateway.

***ABN AMRO Bank, Karachi, 1992 – 1994.***

*Country Technology Head, Automation & Information Technology.*

- Responsible for all Software Development and Technology.
- Setup complete Client/Server based front end banking system with signature verification, using Oracle 7, with distributed data bases.
- Setup of Telebanking System and Automated Voice Response Systems.
- Installation of 100+ user LAN, in Karachi.
- Complete setup of Lahore Branch including LAN, and IBM Mainframe connectivity.
- Setup of Fiber Optic based Leased Line connectivity between Lahore and Karachi branches, and integration of routers, IBM cluster controller, and LAN to LAN integration.
- Setup of 100+ line PABX using Siemens 601 PABX in Karachi and Lahore.
- Project Manager for SWIFT (Society for Worldwide Inter-bank Financial Transactions).

***Lever Brothers Pakistan Ltd., Pakistan, 1992 – 1993.***

*Manufacturing Systems Engineer, Technical Department.*

- Assisted in the management of four Control and Instrumentation projects for Lever Brothers and Lever Chemicals in Karachi and Rahim Yar Khan. Total budget about 20 Million Rupees.
- Actively involved in the implementation of Project MASHAL (Manufacturing and Sales, High Level Accounting and Logistics). This was a company-wide IT project to enhance the competitive edge of the company. The objective being to improve inventory control and accountability of yields, implement standard consisting, and streamline the Manufacturing process.
- Nominated and participated in a Unilever Control Seminar in U.K., January 24-27, 1993.

***NYNEX Corporation, New York, USA, 1989 – 1992.***

*Member of Technical Staff, Advanced Technology Development, NYNEX Science & Technology, White Plains, NY.*

- Subject Matter Expert on Broadband Networks.
- Conducted frequent seminars and Lab. Demonstrations on NYNEX's broadband network: "SMDS: Switched Multimegabit Data Service".

- Written extensive simulations in C, of the IEEE 802.6 protocol and the SMDS network, with numerous presentations and paper contributions.
- Actively involved in broadband Switch vendor selection.
- Active participant in International Standards activities.

### **Participation in International Standards:**

#### ***IEEE 802 STANDARDS***

- Technical Editor of the IEEE Standard 802.6 DQDB Metropolitan Area Network. August 1989-1992.
- The standard is one of an internationally renowned set of local Area/Metropolitan Area Network standards, with a regular international mailing list of over two hundred. The standard was published in July 1991.
- Voting member of IEEE 802.6. Made numerous contributions and presentations to the IEEE 802.6 Working Group, with over a hundred international participants.

### **Seminars, Conferences and Trainings:**

- Speaker at Microsoft Faculty Meet 2008, February 3<sup>rd</sup> 2008.
- Keynote speaker at ICICT2007, “Telecommunications Industry: Trends, Challenges & Opportunities”, December 15<sup>th</sup> 2007.
- Organized and took part in conducting the 16 week long “Computer Skills” portion of CBR Capacity Building Program, for grade 17-19 officers during 2006-07.
- Speaker at Microsoft launching of Imagine Cup in Pakistan, February 21<sup>st</sup> 2006.
- Keynote speaker at Microsoft Junior Developer Curriculum (JDC) conference, June 16<sup>th</sup> 2005.
- Panel Speaker at Pakistan Press Foundation on World Telecommunication Day, “Creating an Equitable Information Society: Time for Action”, May 21<sup>st</sup> 2005.
- Speaker at NCR Seminar, “Importance of Quality in the IT Industry”, December 15<sup>th</sup> 2004.
- Keynote speaker at Microsoft Pakistan Developers Conference (PDC), June 17<sup>th</sup> 2004.
- Panel Speaker at Pakistan Press Foundation on Computer Security, April 2<sup>nd</sup> 2004.
- Guest Speaker at IBA, March 1998, topic: “Intra-branch and Inter-branch networking: Technologies and Service Providers”.
- Presented paper at LUMS, July 1997 on: “Data Communications Industry – A Private Operator’s Perspective”.
- Participated in Panel discussion at LUMS, July 1997 on “Data Communications in Pakistan”.
- Presented paper at IEEE conference in Karachi, 1996 on “Wide Area Networks in Pakistan”
- One of four Panel members at the 16<sup>th</sup> Local Computer Networks Conference, Minneapolis, October 1991. Published and presented a paper in a panel discussion on Local Area Networks Interconnection.

- Organized & Conducted an all-day seminar at NYNEX Science & Technology, September 1990, on:
  - “Switched Multimegabit Data Service (SMDS) Overview”, and
  - “IEEE 802.6 DQDB Metropolitan Area Network (MAN) Standard”, with audiences from New England Telephone, New York Telephone, NYNEX Services Company and NYNEX Corporation.
- Presented Tutorials at the IEEE 802 Plenary Sessions, with an international audience of over a hundred, on:
  - “Distributed Queue Dual Bus Performance”, Denver, Colorado, July 1990.
  - “Distributed Queue Dual Bus Operation and Performance”, Irvine, California, March 1990.

### **Research Grants & Experience:**

#### ***IBA***

- Received Rs. 1 Million HEC Research Grant for “Study of the performance analysis of CDMA and TDMA based channel access techniques for broadband wireless networks such as IEEE 802.21, or 4g Cellular Networks”, in 2005, with Co-PI Faisal Iradat.

#### ***Columbia University***

- Graduate Research Assistant, September 1984 – July 1989.
- Research on analysis and modeling of High-Speed Switching Systems, for Broadband networks.
- Extensive Software Simulation in C of high speed networks.

### **Summer Work Experience:**

#### ***MIT Lab. For Computer Science***

- Summer 1984: Design, implementation and testing of a 40 Mbps serial link prototype for LISP machines, interfaced to a M680000 microcomputer for testing; including extensive assembly language software for diagnostics.
- Summer and fall, 1983: Simulation of an n-cube packet switched network in Pascal. Functional specifications of a nxn switch module for networking a Data Flow Machine.

#### ***GTE Laboratories, Massachusetts, USA***

- Summer 1986: Performance analysis of Voice/Data integrated systems. See Publication, January 1988.
- Summer 1985: Performance analysis of Burst Switching. See Publication October 1987.

## **Teaching, Training & Consulting Experience:**

### ***Columbia University, USA***

- Teaching Assistant: Analog Electronics Lab., fall 1984.

### ***Acsys Limited, Pakistan***

- Conducted in depth Asynchronous Transfer Mode (ATM) training to *Pentagon Systems*, a US based company.
- Appointed as IT Consultant to *Central Depository System (CDS)*. CDS provides the Settlement and Securities transfer for the Stock Exchanges in Pakistan.

## **Doctoral Thesis:**

Approximation methods in the analysis of broadband Voice/Data/Video Integrated Systems. In particular a Decomposition Approximation to queuing analysis of an integrated services, movable boundary scheme. Extensive software models were created for the simulation of such networks.

## **Honors and Awards:**

- Best Teacher Award from the province of Sindh, Pakistan for 2007, awarded by the Prime Minister, Pakistan.
- NYNEX Standards Appreciation Commendation Medal, November 1990.
- Voting Member, IEEE 802.6 Committee, 1989-1992.
- Research Fellowship, Columbia University, 1984-1990.
- Undergraduate Scholarship, Massachusetts Institute of Technology, 1980-1984.
- IEEE speaker appreciation medal, 1996.

## **Publications:**

1. S. Ghani, "Performance of VoIP in Wireless Networks in Presence of Self Similar Data Traffic", *International Symposia on Modelling and Simulation*, July 4 – 6, 2011, Calgary, AB, Canada.
2. R.H. Abedi, N. Aslam and **S. Ghani**, "Fault Tolerance Analysis of Heterogeneous Wireless Sensor Network", *24th Canadian Conference on Electrical and Computer Engineering*, May 8-11, 2011, Niagara Falls, Ontario, Canada
3. **S. Ghani** and F. Iradat, "Loss Probability in Networks with Pareto Distributed Traffic", *Proceedings of the 2nd International Conference on Intelligent Systems, Modelling and Simulation (ISMS 2011)*, Kuala Lumpur, 24 January, Phnom Penh 27 – 28 January 2011; ISBN 978-0-7695-4336-9.

4. W. M. Arain and **S. Ghani**, "Impact of offered load on performance of routing protocols in Mobile Ad Hoc Networks", *UKSim 4th European Modeling Symposium on Mathematical Modeling and Computer Simulation (EMS 2010)*, Pisa, Italy, 17-19 Nov. 2010.
5. R. H. Abedi, **S. Ghani** and S. Haider, "Selection of Cluster Heads in Wireless Sensor Networks using Bayesian Networks" *International Conference on Computer, Electrical, and Systems Science, and Engineering (ICCESSE)*, Amsterdam, Netherlands, September 28-30, 2010.
6. F. Iradat and **S. Ghani**, "Average End-to-End Packet Delay Performance of IEEE 802.11 with Gamma Distributed Mean Service Time Intervals", *18th International Conference on Software, Telecommunications and Computer Networks (Softcomm'10)*, Split – Adriatic Islands, Croatia, September 23-25, 2010.
7. F. Iradat and **S. Ghani** , "Determining Normalized Measure of Dispersion for Evaluating the Performance of IEEE 802.11", *10th International IEEE Conference on Next Generation Teletraffic and Wired/Wireless Advanced Networking (NEW2AN'10)*, LNCS 6294, St.Petersburg, Russia, August 23-25, 2010.
8. W.M. Arain and **S. Ghani**, "Impact of Load-balancing in M-TORA", *International Conference on Computer, Electrical and Systems Science and Engineering (ICCESSE 2010)*, (ISSN 2070-3724), Paris, France, 28-30 July 2010.
9. **S. Ghani**, "Analysis of Pareto Distribution on Delay Performance in Networks", *1st International Conference on Wireless Communications Frontiers (WCF 2010)*, Chongqing, China, 12-14 July 2010, and also to be published in "Communications of SIWN" (ISSN 1757-4439).
10. **S. Ghani**, "The Impact of Self Similar Traffic on Wireless LAN", *International Wireless Communications and Mobile Computing Conference (IWCMC 2010)*, Caen, France, June 28 - July 2, 2010.
11. F. Iradat and **S. Ghani**, "Limitations of Using Existing Queueing Models for Modeling IEEE 802.11 DCF", *International Conference on Computer, Electrical, and Systems Science, and Engineering (ICCESSE 2010)*, Paris, France, June 28-30, 2010.
12. W.M.Arain and S. Ghani, "An instantiation of Way Point Routing for Mobile ad hoc Networks," *International Conference on Information and Communication Technologies, 2009. (ICICT 2009).*, Karachi, Pakistan, 15-16 August. 2009, Pages: 52 – 56.
13. R. Faruqui and S. Ghani, "A Simulation Study of Block Acknowledgements and TXOPs under Varying Channel Conditions", *12th IEEE International Multitopic Conference (IEEE INMIC 2008)*, Karachi, Pakistan, 23-24 December 2008.
14. F. Iradat and S. Ghani "Study of Guard-Channel-Based Call Admission Control Schemes for 4G Cellular Networks", *5<sup>th</sup> International Workshop on Frontiers of Information Technology*, Islamabad, Pakistan, December 17-18, 2007.

15. E. Tayab and S. Ghani, "Sensor based RFID Networks for RTLS", *Sixth Research Conference On Management Sciences, Computer Sciences And Social Sciences & Economics*, SZABIST, Karachi, December 10, 2005.
  16. F. Iradat and S. Ghani "Study of CDMA and TDMA Based Channel Access Techniques for IEEE 802.16 Broadband Wireless Networks", *2<sup>nd</sup> International Workshop on Frontiers of Information Technology*, Islamabad, Pakistan, December 20-21, 2004.
  17. S. Ghani and M. Schwartz, "A Decomposition Approximation for the Performance Evaluation of Non-Preemptive Priority in GSM/GPRS," *The First International Conference on Broadband Networks (BroadNets 2004)*, San José, California, USA, October 25-29, 2004.
  18. S. Ghani and M. Schwartz, "A Hierarchical Analysis of Access Multiplexers with Multimedia Traffic", *The Ninth IEEE Symposium on Computer and Communication (ISCC'2004)*, Alexandria, Egypt, June 29-July 1, 2004.
  19. S. Ghani, "Use of Approximation Methods in the Analysis of Communication Networks with Heterogeneous Traffic", *1<sup>st</sup> International Workshop on Frontiers of Information Technology*, Islamabad, December 23-24, 2003.
  20. S. Ghani and E. Tayab, "Integrated Networks - Implementation of VSATs and Radio Modem Network", *Workshop on Computers and Telecommunications Technology*, LUMS, Lahore. 1997.
  21. S. Ghani and M. Schwartz, "A Decomposition Approximation for the Analysis of Voice/Data Integration", *IEEE Transactions on Communications*, Vol 42, No. 27, July 1994.
  22. S. Ghani, "Comparison of DQDB and FDDI MAC Access Protocols", *16<sup>th</sup> Local Computer Networks Conference*, Minneapolis, October 1991.
  23. Peter Evans and Sayeed Ghani (Editors), *IEEE Standard: Distributed Queue Dual Bus (DQDB) Subnetwork of a Metropolitan Area Network (MAN)*, 802.6-1990, 1991.
  24. S. Ghani, M. Schwartz and S. Ganguly, "A Comparison of FDDI and 802.6 Standards", *Fourth IEEE Workshop on Metropolitan Area Networks*, Fort Myers, Florida, November 1990.
  25. S. Ghani and M. Schwartz, "A Decomposition Approximation for the Analysis of Voice/Data Integration", *Proceedings Indo-US Workshop on Systems and Signal Processing*, Bangalore, India, January 1988.
- P. O'Reilly and S. Ghani, "Data Performance in Burst Switching when the voice silence periods have a hyper-exponential distribution", *IEEE Transactions on Communications*, October 1987. (Also published in ICC 1986.)

