Ghazanfar Ali

Lubbock, Texas, USA 79423 • ghazanfar.ali@ttu.edu • +1 806 724 5332
https://www.linkedin.com/in/ghazanfar-ali-sanpal-387ba0a/

PROFESSIONAL PROFILE

- Multidimensional seasoned professional with approximately 17 years' experience in the computing arena.
- Developed voice over IP (VoIP) solutions, garnered experiences in project management, technology standardization by working with global standards development organizations (ITU, 3GPP, ETSI, OMA, DMTF).
- Chaired a working group, and established industry relationships by meeting with different ZTE customers and vendors around the globe.
- As a doctoral student, learned and practiced state of the art machine learning models, data science, distributed and parallel computing, and research methodologies.
- Strengthened leadership skills by leading and mentoring team of students working on projects for industry members of the multi-university National Science Foundation (NSF) industry-university cooperative research center in Cloud and Autonomic Computing (CAC) program.
- Acquired the unique opportunity to work as a Student Research Scientist at renowned national laboratories of United States including Los Alamos National Laboratory (LANL) and National Energy Research Scientific Computing Center (NERSC) division of Lawrence Berkeley National Laboratory (LBNL).
- LBNL has developed a collaboration with TTU, sponsoring my research.

EDUCATION

Texas Tech University (TTU), Lubbock, Texas
Doctor of Philosophy in Computer Science — Expected Graduation: July 2022
Dissertation: Deterministic Control of High-End Computing Systems — **GPA: 3.65**

Quaid-i-Azam University, Islamabad, Pakistan
Master of Science in Computer Science — Graduated: September 2003
Master's Thesis: Internet Protocol (IP) based Private Automatic Branch eXchange (PABX) — **GPA: 3.70**

PhD RESEARCH TOPIC

Research activities include identification of data center management areas in which data center operators are not yet aware of their ability to exert control and automation. The intent is to devise future-ready new data center management paradigms, especially by inducing unified control points, minimizing human intervention, and entangling node telemetry information with applications running on the node, using highly autonomic, predictable, and standardized methodologies.
As a part of university/industry collaboration, this research work is coordinated and contributed to LBNL, Ultra-Scale Research Center (USRC) at LANL, Dell Inc., Distributed Management Task Force (DMTF)'s Redfish Forum, and TTU's High Performance Computing Center (HPCC).

Lab/Industry Advisors: Dr. Sridutt Bhalachandra (LBNL), Mr. Lowell Wofford (LANL), Mr. Jon Hass (Dell Inc).
Academic Advisors: Dr. Yong Chen (Director, Cloud and Autonomic Computing Center (CAC), TTU)
Dr. Alan Sill (Sr. Managing Director, High Performance Computing Center (HPCC), TTU)

Technical Publication

1) Accepted (IEEE Cluster 20): MonSTer: An Out-of-the-Box Monitoring Tool for High Performance Computing Systems (as 2nd author)
2) Accepted Poster (SC20): Evaluation of power controls and counters on general-purpose Graphics Processing Units (GPUs) (https://sc20.supercomputing.org/proceedings/tech_poster/poster_files/rpost131s2-file3.pdf) (1st author with LBNL)
3) Work in progress: Out-of-Band (BMC based) Data Center Monitoring using DMTF Redfish API Integration with Nagios (https://sc18.supercomputing.org/presenter/indexbea7.html?uid=141473) (1st author with DELL)
4) Work in progress: CPU Temperature Shaman: Automating Healing of CPU Temperature in Data Center (https://www.overleaf.com/project/5e596e68f70c4300010d5dc3) (as 1st author with LANL)

NSF CLOUD AUTONOMIC COMPUTING CENTER GRADUATE FELLOWSHIP

Texas Tech University, Lubbock Texas — *2016 - 2018*

- One of three graduate students from Texas Tech University's Computer Science Department to receive an NSF CAC graduate fellowship.

TECHNICAL SKILLS

Data Center Infrastructure Management (DCIM)	Out-of-band protocols (Redfish, IPMI)	Nagios Monitoring Framework	Machine Learning Models	Predictive Analytics of Power & Energy	Data Science
Cluster Management (OpenHPC)	Internet of Things (IoT)	Software Defined Networking (SDN)	Network Function Virtualization (NFV)	InfluxDB	BigData Analytics
Voice over IP (VoIP) Protocols (SIP & H.323)	Linux (CentOS)	Shell/Bash	Open Multi-Processing (OpenMP)	Message Passing Interface (MPI)	Server-Sent-Event (SSE)
Programing (C, Python, Golang)	Automation and Control	GPU Programing (CUDA/OpenCL/OpenACC)	OpenAPI Design	Microservice Architecture	DevOps
Cloud Computing (OpenStack)	Docker Container	IP Multimedia Subsystem (IMS)	Application Performance	Long Term Evolution (LTE)	Evolved Packet Core (EPC)

EXPERIENCE

Texas Tech University's Computer Science Department Lubbock, Texas
Research Assistant 6/2021 – Present
Objectives of this research study include:
- Impact of power controls on performance, power, and energy consumption behaviors of different GPU architectures and workloads
- Developing a predictive model for performance, power, and energy consumption and find optimal energy profile
- Findings and results are expected to guide the design, procurement, and operation of energy efficient and power scalable GPU-enabled HPC systems

Texas Tech University's Computer Science Department Lubbock, Texas
Teaching Assistant 9/2020 – 5/2021
- Assisted in teaching course ENGR 1330 (Computational Thinking with Data Science)
- Introduces Python programming, computational thinking, statistical methods, and state-of-the-art machine learning algorithms to undergraduate students for solving problems in various engineering disciplines

Lawrence Berkeley National Laboratory (LBNL) Berkeley, California
Research Assistant 6/2020 – 9/2020
- Investigated and analyzed GPU architecture for energy efficiency in terms of off-loading compute-intensive work from CPU to GPU devices in high-end computing systems. (https://github.com/nsfcac/gpupowermodel)

Texas Tech University's CS Department Lubbock, Texas
Teaching Assistant 1/2020 – 5/2020

- Assisted teaching work for two graduate courses including Operating System (OS) and Parallel Programing
- Developed methods of automation and control of the HPC data center:
  - Developed distributed metric collector for HPCC data center (https://github.com/nsfcac/DistributedMetricCollector)
  - Acquired CPU power usage and memory power usage via Intel (RAPL) interface (https://github.com/nsfcac/rf-emulator-likwid)

Los Alamos National Lab Los Alamos, New Mexico
Research Assistant July 2019 – January 2020

- Conducted research and development of the next generation management software stack for HPC systems: In-band (on host) CPU thermal acquisition module for Kraken: https://github.com/kraken-hpc/kraken-legacy/tree/main/modules/hostthermaldiscovery
- In-band (on host) CPU frequency scaling module for Kraken: https://github.com/kraken-hpc/kraken-legacy/tree/main/modules/hostfrequencyscaling
- Out-of-band (DMTF Redfish API) CPU thermal acquisition module for Kraken: https://github.com/kraken-hpc/kraken-legacy/tree/main/modules/rfthermaldiscovery
- Out-of-band (DMTF Redfish API) power control module for Kraken: https://github.com/kraken-hpc/kraken-legacy/tree/main/modules/rfpipower
- DMTF Redfish API based power controller for Raspberry Pi cluster: https://gitlab.newmexicoconsortium.org/usrc/ngss/pi-power/tree/rfpipowerapi/rfPiPower
- Redfish aggregation Service for HPC management software stack: https://gitlab.newmexicoconsortium.org/usrc/ngss/kraken-redfish/tree/master/rfaggregator

Texas Tech University's NSF CAC Lubbock, Texas
Research Assistant September 2018 – June 2019

- Distributed Metric Collector for High-Performance Computing (HPC) data center (https://github.com/nsfcac/DistributedMetricCollector)
- Integrate Nagios Core with Redfish API for Data Center Monitoring using Python and Shell: https://github.com/nsfcac/Nagios-Redfish-API-Integration
- Acquisition of CPU power usage and Memory Power usage via Intel RAPL interface (https://github.com/nsfcac/rf-emulator-likwid)
- Provision of High-Performance Computing (HPC) cluster using OpenHPC stack and Redfish API
- Replaced Redfish API with IPMI protocol in OpenHPC based cluster provisioning, management, and monitoring

Texas Tech University's High-Performance Computing Center (HPCC) Lubbock, Texas
Graduate Assistant February 2017 – August 2018

- Worked on numerous high-performance computing (HPC) projects including collecting cluster monitoring data using Intelligent Platform Management Interface (IPMI) and Redfish API
- Replaced Redfish API with IPMI protocol in OpenHPC based cluster provisioning, management, and monitoring

ZTE Corporation, NanJing, China
Senior Research Standardization System Engineer January 2016 – January 2017

- Researched, analyzed, and contributed to the development of Cloud standards.
- Major contributions: ITU-T SG13 (Inter-Cloud) and ETSI Network Function Virtualization (interfaces and architecture).

NFV/SDN Research Engineer January 2012 – December 2015

- Researched and standardized Cloud and Virtualization technologies in DMTF and ETSI NFV
- Deliverables: Contribution to Network Function Virtualization interfaces and DMTF Open Virtualization Format (OVF) standard

Senior Standards Manager January 2008 – December 2011

- Worked in standard development and editor in ITU-T SG13 and OMA organizations
- Deliverables: service delivery platform (SDP) (ITU-T Y.2240, ITU-T Y.2025) & OMA Converged IP Messaging (CPM) standards

NGN Technical Engineer October 2005 – December 2007

- Investigated customer's requirements, designed solutions, liaised with sales and engineering.
- Supported deployment of softswitch, media gateway, signaling gateway in carrier's networks.

Advanced Communications, Islamabad, Pakistan
Senior Software Engineer September 2003 – September 2005

- Developed voice over IP (VoIP) products using VoIP protocols (H.323 and session initiation protocol (SIP)) in C++
- Service developer of company-maintained VoIP services (Beyondphone.com, AdCalls).
- Led a small software development team and coordinated with operations and sales teams.

Carrier Telephone Industries (CTI), Islamabad, Pakistan
Trainee January 2003 – August 2003

- Researched computer telephony integration (CTI) topic and implemented "Internet protocol (IP) based private automated branch exchange (IP-PABX)" in C++

LEADERSHIP EXPERIENCE

- Represented ZTE as Chair of DMTF Cloud Management Sub-Committee (CMSC) and Cloud Management Working Group (CMWG): served as chair of CMSC from March 2014 to September 2014. CMSC was responsible to coordinate the progress and issues of CMWG, Network Services Management Working Group (NSMWG), and Open Virtualization Format Working Group (OVFWG). Later, served chair of CMWG from April 2014 to December 2016. This working group included members from 50 companies such as Fujitsu, Telecom Italia, VMWare, Oracle, IBM, Hitachi. This role involved managing agenda items, minutes, motions for procedural orders, voting and balloting for weekly calls and face-to-face meetings. Effectively led this group in developing Cloud Infrastructure Management Interface (CIMI).
- Mentoring: Master Students in their thesis work
- Managing research projects for industry members of the NSF industry-university cooperative research center in Cloud and Autonomic Computing (CAC) program

SELECTED TALKS/WORKSHOPS

- Speaker at ITU Workshop on "Cloud Computing Standards - Today and the Future" (Geneva, Switzerland) (http://www.itu.int/en/ITU-T/Workshops-and-Seminars/cc/Pages/GHAZANFAR-Ali.aspx)
- Speaker at ITU Workshop on "Service Delivery Platforms (SDP) for Telecommunication Ecosystems: from today's realities to requirements and challenges of the future" (Geneva, Switzerland) (http://www.itu.int/ITU-T/worksem/sdp/bios.html)
- Speaker at Global Standardization Collaboration (GSC-15) Beijing, China (http://gsc15.ccsa.org.cn)

REPRESENTATION AT INTERNATIONAL FORUMS:

- Honored to represent ZTE Corporation at various SDO including ETSI, DMTF, ITU, OMA, and 3GPP.
- On the behalf of ZTE, took different roles including delegate, technical editor, and working group chair in the development of Information and Communications Technologies (ICT) related specifications.
- Attended numerous face-to-face meetings across Pacific Asia, Europe, and North America. Details of some of selected meetings are as follows:

1. DMTF OVFWG meeting in San Jose (CA), USA Mar 5 - 7, 2013
2. ITU-T SG13 WP6 meeting in Seattle (WA), USA Oct 14 - 20, 2012
3. DMTF SVPC WG meeting in Broomfield (CO), USA Oct 02 - 04, 2012
4. DMTF SVPC WG meeting in San Jose (CA), USA Aug 22 - 25, 2012
5. ITU-T NGN-GSI meeting in Geneva, Switzerland Jun 04 - 15, 2012
6. DMTF SVPC WG meeting in Boeblingen, Germany May 07 - 11, 2012
7. ITU-T NGN-GSI meeting in Geneva, Switzerland Feb 06 - 17, 2012
8. SNIA Winter Symposium in San Jose, USA Jan 22 – 26, 2012
9. DMTF CM WG meeting in San Francisco, CA USA Dec 06 - 08, 2011
10. SNIA cloudtwg meeting in SunnyVale, CA USA Nov 28 – Dec 01, 2011

11.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Oct 10 - 21, 2011
12.	ITU-T NGN-GSI meeting in Geneva, Switzerland	May 09 - 20, 2011
13.	OMA meeting in Sorrento, Italy	Apr 10 - 15, 2011
14.	OMA meeting in Honolulu (Hawaii), USA	Feb 08 - 12, 2011
15.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Jan 17 - 28, 2011
16.	ITU-T FG Cloud Computing meeting in Nanjing, China	Jan 10 - 13, 2011
17.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Sep 06 - 16, 2010
18.	Global Standard Collaboration meeting in Beijing, China	Aug 30 - Sept 02, 2010
19.	China/Japan/Korea UNIOT meeting in Seoul, Korea	Aug 18 - 20, 2010
20.	ITU-T SG13 interim meeting in Dalian, China	Jul 05 - 09, 2010
21.	OMA meeting in Las Vegas, USA	Jun 26 - Jul 03, 2010
22.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Apr 18 - 30, 2010
23.	OMA meeting in Sorrento, Italy	Jan 31 - Feb 04, 2010
24.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Jan 18 - 29, 2010
25.	ITU-T SG13 interim meeting in Sanya, China	Nov 15 - 20, 2009
26.	OMA meeting in Los Angeles, USA	Oct 19 - 24, 2009
27.	OMA interim meeting in Shenzhen, China	Sep 22 - 25, 2009
28.	OMA meeting in Singapore, Singapore	Aug 24 - 28, 2009
29.	OMA interim meeting in Montreal, Canada	Jul 21 - 24, 2009
30.	OMA meeting in Boston, USA	Jun 21 - 26, 2009
31.	ITU-T NGN-GSI meeting in Geneva, Switzerland	May 11 - 22, 2009
32.	OMA meeting in Helsinki, Finland	Apr 18 - 25, 2009
33.	OMA meeting in Macau, China	Feb 09 - 14, 2009
34.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Jan 12 - 23, 2009
35.	OMA meeting in Osaka, Japan	Oct 22 - 27, 2008
36.	ITU-T NGN-GSI meeting in Geneva, Switzerland	Sep 01 - 12, 2008
37.	ITU-T SG13 interim meeting in Seoul, republic of Korea	Jul 14 - 18, 2008
38.	OMA meeting in Prague, Czech Republic	Jun 23 - 27, 2008
39.	ITU-T NGN-GSI meeting in Geneva, Switzerland	May 10 - 24, 2008
40.	OMA meeting in Paris, France	Apr 14 - 18, 2008

ACADEMIC TECHNICAL PUBLICATIONS

- Accepted Poster (SC20): Evaluation of power controls and counters on general-purpose Graphics Processing Units (GPUs) (https://sc20.supercomputing.org/proceedings/tech_poster/poster_files/rpost131s2-file3.pdf) (1st author with LBNL)
- Accepted (IEEE Cluster 20): MonSTer: An Out-of-the-Box Monitoring Tool for High Performance Computing Systems (as 2nd author)
- Submitted (under peer review): CPU Temperature Shaman: Automating Healing of CPU Temperature in Data Center (https://www.overleaf.com/project/5e596e68f70c4300010d5dc3) (as 1st author with LANL)
- Submitted (under peer review): Out-of-Band (BMC based) Data Center Monitoring using DMTF Redfish API Integration with Nagios (https://sc18.supercomputing.org/presenter/indexbea7.html?uid=141473) (1st author with DELL)

ICT INDUSTRY STANDARDS AND SPECIFICATIONS

- Participated in the development of the following standards and specifications in different standard bodies (ETSI, DMTF, ITU-T, OMA, 3GPP):

1) **ETSI NFV Vi-Vnfm reference point**
   Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Vi-Vnfm reference point - Interface and Information Model Specification
   Role: Contributor
   Publication: https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=54096

2) **ITU-T Y.E2ECSLM**
   ITU-T End to End Cloud Service Lifecycle Management (CSLM) standard

Role: Technical editor and Contributor
Publication: https://www.itu.int/md/T13-SG13-160627-TD-PLEN-0293

3) **ITU-T/ISO Y.CCRA**
ITU-T/ISO Cloud Computing Reference Architecture (CCRA) standard
Role: Participant
Publication: https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=12209

4) ITU-T Y.2025
Functional architecture of next generation network service integration and delivery environment
Role: Technical editor, Contributor
Publication: https://www.itu.int/rec/T-REC-Y.2025-201207-I/en

5) ITU-T Y.2240
Requirements and capabilities for next generation network service integration and delivery environment
Role: Technical editor, Contributor
Publication: https://www.itu.int/rec/T-REC-Y.2240-201104-I/_page.print

6) ITU-TY.2214
Service requirements and functional models for customized multimedia ring services
Role: Technical editor, Contributor
Publication: https://www.itu.int/rec/T-REC-Y.2214/en

7) ITU-T Q.3610
Signaling requirements and protocol profiles for customized ring-back tone service
Role: Contributor
Publication: https://www.itu.int/rec/T-REC-Q.3610/_page.print

8) ITU-T Q.3611
Signaling requirements and protocol profiles for customized ringing tone service
Role: Contributor
Publication: https://www.itu.int/rec/T-REC-Q.3611/en

9) OMA CPM
Converged IP Messaging (CPM) enabler
Role: Technical editor in some specs, Contributor
Publication: http://www.openmobilealliance.org/release/CPM/V2_0-20150113-C/OMA-AD-CPM-V2_0-20130611-C.pdf

10) DMTF CIMI V1.0 (DSP0263)
Cloud Infrastructure Management Interface (CIMI) Model and REST Interface over HTTP
Role: Contributor
Publication: https://www.dmtf.org/sites/default/files/standards/documents/DSP0263_2.0.0.pdf

11) DMTF OVF V2.0 (DSP0243)
DMTF Open Virtualization Format (OVF)
Role: Contributor
Publication: https://www.dmtf.org/sites/default/files/standards/documents/DSP0243_2.1.1.pdf

12) 3GPP IP-SM-GW enhancement
Enhancements to IP Short Message Gateway
Role: Participant
Publication: https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=904

ESSENTIAL PATENTS

Co-inventor of the following essential patents (EPs) embodied in different industry standards:

- Method and system for implementing group message service based on converged service system
- A method for realizing message interworking and a converged service system
- A method/system for processing the message and an integrated service system
- Method and system for sending large message mode converged IP messaging message to group
- Method for negotiating message session relay protocol connection parameters
- Method and system for transmitting large message mode converged IP messages
- Method and system for transmitting converged IP message in large message mode
- Media link establishment method for transmitting large message mode CPM messages to groups
- Method and system for intercommunicating between instant message and e-mail

INVOLVEMENT

- *Distributed Management Task Force (DMTF)* 2012 – Present
- *Association for Computing Machinery (ACM)* 2017 - Present
- *Women in High Performance Computing (WHPC)* 2018 - Present

AWARDS/ACHIEVEMENTS/DISTINCTIONS

- DMTF 2014 Star Award
- Earned four supper (“S”) grades in bi-annual ZTE Corporation evaluations
- Attended approximately 60 face-to-face meetings in different continents, including Pacific Asia, Europe, and North America
- Active contributor and technical editor of the 12 technical standards
- Delivered and presented about 400 technical proposals/contributions in different technical standards
- Multilingual: Urdu, English, Arabic, Chinese

PROFESSIONAL TRAININGS

- Integrated Services over Packet Network (ISPN) training from CASE institute, Pakistan
- Next-Generation Network (NGN) product suite (SoftSwitch, Media Gateway, Signaling Gateway, and Terminals) training from Nanjing R&D Center, ZTE Corporation, China
- Advanced NGN product suite (SoftSwitch, Media Gateway, and Signaling Gateway) training from ZTE University, Shenzhen, China
- Advanced data communication training from ZTE University, Shenzhen, China
- Intelligent Network (IN) training from Nanjing R&D Center, ZTE Corporation, China