

Dr. SUNDUS ALI

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PEC NO.: TELE/668

HEC Approved PhD Supervisor, Member IEEE, IEEE ComSoc, Fellow Pak. Academy of Engineering, Local Council member IEP

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ACADEMIC QUALIFICATION:

PhD, Electronic Engineering NED University of Engineering and Technology CGPA: 3.9/4.00
December 2019

Supervisors: Dr. Muhammad Imran Aslam (CTC, NED UET) and Dr. Irfan Ahmed (CDP, NED UET)

Title: Uplink Performance of Decoupled Heterogeneous Networks in varying Pathloss Environment

Research Discipline: Wireless Communication

M.Engg. Telecommunication Engineering, October 2010 Hamdard University (Usman Institute of Technology) CGPA: 4.00/4.00

Gold Medal Recipient

B.S. Telecommunication Engineering, July, 2008 NUCES-FAST, Karachi CGPA: 3.77/4.00

Bronze Medal Recipient

RESEARCH INTERESTS: Wireless Communication, Communication Networks, Analytical Modelling, Simulation, Research and Academic Management

RESEARCH EXPERIENCE:

Projects:

- Principal Investigator, Sindh HEC funded SRSP 2023-24 Project: “**Mob-Air: Indigenously developed mobile air quality monitoring system for public health and safety**” worth **PKR 3.4 Million**
- Co-Principal Investigator for British Council and HEC Going Global Partnership PAK-UK Education Gateway Mobility Partnership for Faculty Mobility Programme for Faculty members, GBP 67,741 (**Title: Mobility for bilateral stakeholder mapping for creating IoT networks for Climate Change**), 2023
- Focal Person and manager of three **HEDP Innovator Seed Fund (ISF)** awards each worth USD 35,000 (total: USD 105,000)
- Co-supervisor for MoST Endowment Fund for research project, “**Analysis of Intelligent Reflective Surfaces in heterogeneous cellular network**”, **PKR 3.0 Million**, 2022
- Co-Principal Investigator in HEC NRPU 2021 project: **NB-IoT ProSe: Proximity Services enabled NB-IoT for Reliable and Critical Communication in Low-Powered Applications**, worth **PKR 6.9 Million**
- Co-supervisor for MoST Endowment Fund for research project, “**Routing Reliability Improvement in IoT-based-MANET**”, **PKR 3.0 Million**, 2020
- Co-supervising one PhD project worth PKR 1 Million each on 6G communication
- PhD research project grant from NEDUET, **PKR 1.0 Million**, 2017
- Worked as PhD scholar on HEC funded NRPU-6054 project titled: “**Flexible testbed for D2D communication in 5G cellular networks**”, **PKR. 6,590,206/-**

Journal Publications:

- Syed Talib Abbas Jafri, Irfan Ahmed, **Sundus Ali**, Jamaiah Yahaya, Faizan Qamar, Zuriani Hayati Abdullah, Split Hop Penalty for Transmission Quality Metric in Better Approach to Mobile Ad-hoc Networking (BATMAN) for IoT-based MANET, MDPI Symmetry, 15(5), 969; <https://doi.org/10.3390/sym15050969> (MDPI, IF:2.7)
- Mariam, Hira, Irfan Ahmed, **Sundus Ali**, Muhammad Imran Aslam, and Ikram Ur Rehman. 2022. "Performance of Millimeter Wave Dense Cellular Network Using Stretched Exponential Path Loss Model" Electronics 11, no. 24: 4226. <https://doi.org/10.3390/electronics11244226> (MDPI IF:2.9)

- Jafri, Syed Talib Abbas, Irfan Ahmed, and **Sundus Ali**, "Queue-Buffer Optimization Based on Aggressive Random Early Detection in Massive NB-IoT MANET for 5G Applications" *Electronics* 11, no. 18: 2955. <https://doi.org/10.3390/electronics11182955> (MDPI, IF: 2.9)
- **Sundus Ali**, Muhammad Imran Aslam, Irfan Ahmed, Attaullah Khawaja, **Uplink performance of narrowband Internet-of-Things devices in Downlink Uplink Decoupled based Heterogeneous Networks**, *Iranian Journal of Science Technology*, 47, 385–399 (2023). <https://doi.org/10.1007/s40998-022-00570-w> (Springer, IF: 2.4)
- **Sundus Ali**, Muhammad Imran Aslam, Irfan Ahmed , "**Impact of Fractional Power Control on DUDe based HetNets in varying Path Loss Exponent Environment**", *Transactions on Emerging Telecommunications Technologies*, doi: 10.1002/ett.4491 (IF:3.6)
- **Sundus Ali**, Muhammad Imran Aslam, Irfan Ahmed and Tayyaba Khurshid, "**Analysis of the Decoupled Uplink Downlink Technique for Varying PLE in Multi-Tier HetNet**", *Telecommunication Systems*", 74, 497–510 (2020). <https://doi.org/10.1007/s11235-020-00661-1> (IF:2.5)
- **Sundus Ali**, Muhammad Imran Aslam, and Irfan Ahmed, "**Analysis of Downlink Uplink Decoupled Dense Heterogeneous Cellular Network based on User Association using Multi-Slope Pathloss Model**", *Advances in Electrical and Computer Engineering*, vol. 19, no. 2, pp. 45-52, 2019. DOI:10.4316/AECE.2019.02006 (IF:1.221)
- **Sundus Ali**, Muhammad Imran Aslam, and Irfan Ahmed. "**Uplink Coverage Probability and Spectral Efficiency for Downlink Uplink Decoupled Dense Heterogeneous Cellular Network using multi-slope pathloss model**", "*Telecommunication Systems*" (Springer), vol. 72, no. 4, pp. 505-516, 2019. DOI:10.1007/s11235-019-00587-3 (IF:2.5)

Conference Publications:

- Fatima Haider Naqvi, **Sundus Ali**, Binish Haseeb, Namra Khan, Soomal Qureshi, Taha Sajid and Muhammad Imran Aslam, **Design and implementation of Smart Contract in supply chain management using Blockchain and Internet of Things**, 2nd International Conference on Emerging Trends in Electronics and Telecommunications Engineering (INTERACT), 15th-16th March 2023, MDPI Eng. Proceedings 2023, 32(1), 3; <https://doi.org/10.3390/engproc2023032015>
- Syed Talib Abbas Jafri, Irfan Ahmed, **Sundus Ali**, and Faizan Qamar, Analysis of AgRED performance in LR-WPAN dense ad-hoc networks, 2nd International Conference on Emerging Trends in Electronics and Telecommunications Engineering (INTERACT), 15th-16th March 2023, MDPI Eng. Proceedings 2023, 32(1), 3; <https://doi.org/10.3390/engproc2023032005>
- Fasih Ur Rehman, Hafiz Muhammad Attaullah, Faisal Ahmed and **Sundus Ali**, **Data Defense: Examine Fintech’s Security and Privacy Strategies**, 2nd International Conference on Emerging Trends in Electronics and Telecommunications Engineering (INTERACT), 15th-16th March 2023, MDPI Eng. Proceedings 2023, 32(1), 3; <https://doi.org/10.3390/engproc2023032003>
- Moazzam Shah Bukhari Syed, Hafiz Muhammad Attaullah, **Sundus Ali** and Muhammad Imran Aslam, **Wireless Communications Beyond Antennas: The Role of Intelligent Reconfigurable Surfaces**, 2nd International Conference on Emerging Trends in Electronics and Telecommunications Engineering (INTERACT), 15th-16th March 2023, MDPI Eng. Proceedings 2023, 32(1), 3; <https://doi.org/10.3390/engproc2023032010>
- Syeda Messan, Asra Shahud, Amna Anis, Roma Kalam, **Sundus Ali** and Muhammad Imran Aslam, "**Air-MIT: Air Quality Monitoring using Internet of Things**", IEEC NEDUET, Karachi, 25th-26th March 2022, MDPI Eng. Proceedings 2022, 20(1), 45; <https://doi.org/10.3390/engproc2022020045>
- Tahniyat Aslam, Irfan Ahmed, **Sundus Ali** and Muhammad Imran Aslam, "**Tera Hertz Communication and Associated Challenges in 6G Cellular Networks**", 4th International Conference on Computing & Information Sciences, November 29-30, 2021, Karachi, Pakistan, DOI: 10.1109/ICCIS54243.2021.9676382
- Nehan Abdul Ghani, Yumna Shahid, Zahra Mubeen, Mahnoor Khurshid, **Sundus Ali** and Muhammad Imran Aslam, "**Prototype Implementation of Device-to-Device Communication**", 4th International Conference on Computing & Information Sciences, November 29-30, 2021, Karachi, Pakistan, DOI: 10.1109/ICCIS54243.2021.9676389
- Aisha Danish, **Sundus Ali**, Muhammad Imran Aslam, Irfan Ahmed, "**Future prospects and challenges associated with intelligent reflecting surfaces enabled wireless communication**", 18th International IEEE HONET Conference, October 11-13 2021, DOI: 10.1109/HONET53078.2021.9615389
- **Sundus Ali** et al., "**Performance Analysis of Single-Hop Device to Device Communication**," IEEE International Bhurban Conference on Applied Sciences and Technologies (IBCAST), 2021, pp. 974-978, doi: 10.1109/IBCAST51254.2021.9393266.
- **Sundus Ali**, Muhammad Imran Aslam, Irfan Ahmed and Hira Mariam, "**Device-to-Device Communication Prototyping using Software Defined Radios**", IEEC, Karachi, Pakistan, February 2020

- **Sundus Ali**, M. Imran Aslam, Irfan Ahmed, **Analysis of Proportional Fairness Utility and Interference Mitigation in Heterogeneous Cellular Networks**, 31st IEEE International Multi-Topic Symposium, Karachi, March 2016
- **Sundus Ali**, M. Imran Aslam, Irfan Ahmed, “**Multi-frequency MIMO channel modeling and capacity analysis using 3-D Spatial Statistical Channel Model for Millimeter Wave Outdoor Communication**”, 14th International Bhurban Conference on Applied Sciences and Technology (IBCAST), Islamabad, 10th-14th January 2017, doi: 10.1109/IBCAST.2017.7868135.
- Abdul Moiz, A.K.M. Shafaat Ali, **Sundus Ali** et al, “**Design & development of linearly polarized C-Band Phased Array Antenna for Air-borne & Space-borne SAR payloads**”, 11th International Bhurban Conference on Applied Sciences and Technology (IBCAST), 2014, doi: 10.1109/IBCAST.2014.6778195.

Conferences and Trainings:

- Conference Secretary, **International Conference on Technology-driven Climate Action (CLIMATECH)**, NEDUET, October 16th and 17th 2023
- Programme Secretary, **2nd International Conference on Emerging Trends in Electronics and Telecommunications Engineering (INTERACT)**, NEDUET, 15th-16th March 2023
- Conducted session on “**EDI in Higher Education in Pakistan**”, UWS Scotland, UK, October 3rd 2023
- Conducted two day boot camp on Innovator Seed Fund Business Proposal submission, 22nd and 23rd February 2023
- Keynote address on “**Prospects of Cellular IoT Research and Commercialization in Pakistan**”, Title of talk: “Prospects of Cellular IoT Research and Commercialization in Pakistan, Third International Conference On Latest trends in Electrical Engineering and Computing Technologies (INTELLECT), 16th-17th November 2022
- Conducted faculty training on “**Startup Management and Incubation at NEDUET**”, 28th February 2022
- Session Chair, 18th IEEE HONET Conference, symposium on “**From 5G to 6G: Secure, Automated and Intelligent Networks**”, 11th October 2021
- Track Chair and Session Chair, IEEE Smart Cities Conference 2021 workshop on “**5G enabled Smart Cities**”, 7th September 2021
- Conducted training on “**Assessing Data and Information Quality**”, on 12th December 2020, organized by Pakistan Academy of Engineering and Pakistan Science Foundation, Karachi.
- Technical Program Committee member (as reviewer) in IEEE GLOBECOM 2018, 2019, 2020 and 2021
- Four Training sessions on Telecommunication and Communication Networks for Department of Petroleum Engineering and Pakistan Petroleum Limited (PPL) from 27th July 2015 to 30th July 2015 for Extended Internship Program for Iraqi Nationals

PROFESSIONAL EXPERIENCE:

- **Assistant Professor, Department of Telecommunications Engineering, NED UET (17th June 2021- to- date)**
- **Manager, Business Incubation Center, ORIC, NED UET (17th April 2021 to date)**
 - Focal Person, Innovator Seed Fund (ISF) by HEDP and World Bank
 - Focal Person, National Idea Lab (NIL) by HEC, SMEDA and NEDUET
 - Focal Person, National Idea Bank 2021-23
 - Overseeing day-to-day operation of business incubator facility,
 - Marketing the facility,
 - Recruiting potential start-ups and campus companies, and assisting in screening potential clients
 - Evaluating and seeking potential funding sources.
 - Assisting in developing and implementing policies
 - Governing the operation of the facility including meeting performance metrics and goals.
 - Conducting business counseling and trainings with startups and clients
- **Assistant Professor, Department of Electronic Engineering (Telecommunications), NED UET (December 2019-to 16th June 2021)**
- **Lecturer, Department of Electronic Engineering (Telecommunications), NED UET (April 2010 to date):**

Teaching Assignments:

Post-graduate:

- Next Generation Networks
- Smart Grid Communication
- Mobile Telephony Systems
- Advance Communication systems
- Telecommunication Network Operations

Undergraduate:

- Next Generation Networks (Final Year Telecommunications Engineering)
- Telecommunication Switching Systems (Final Year Telecommunications Engineering)
- Telecommunication Management Networks (Final Year Telecommunications Engineering)
- Communication Systems (Third Year Electrical, Computer Systems and Electronic Engineering)
- Signals and Systems (Second Year, Telecommunication and Electronic Engineering)

Administrative Assignments:

- Manager Business Incubation Center, ORIC, NEDUET (April 2021- date)
- Member/Secretary BIC Steering Committee, ORIC, NEDUET (April 2021-date)
- Member, Board of Review, Quality Management Cell, NEDUET (January 2024-date)
- Member, Board of Review, Office of Research, Innovation and Commercialization (December 2021- date)
- Member/Secretary, Industrial Advisory Board, Department of Telecommunications Engineering (July 2021-date)
- Member/Secretary, Board of Studies, Department of Telecommunications Engineering (July 2021-date)
- Member, Board of Faculty, Faculty of Electrical and Computer Engineering (November 2021-date)
- Area/ISO Coordinator, Department of Telecommunications Engineering (17th June 2021- date)
- LRCA Certified Lead Quality Auditor, Internal Auditor Team member for NED UET (2017 to date)
- Learning Management System Facilitator Second Year Telecommunication Engineering (April' 20- June '21)
- Member Programme Team for development of SAR for MS Telecom Systems Programme
- Class Advisor, Second Year Telecommunication Engineering (November 2019-June 2021)
- Member, Departmental Outcome Based Education Team (April 2017 to October 2021)
- Head of Documentation and Content, International Conference on Emerging Trends in Telecommunication and Electronic Engineering 2018 (August 2017 to March 2018)
- ISO/Area Coordinator for Telecom Engineering Programme (2014 till August 2017)
- Faculty In-charge, Career Expo 2011 (August-September 2011)
- Faculty Coordinator: TE-Links- Official Telecom Discussion Forum of NED UET (January 2011 to date)
- In-charge SENTEC (Society for the Promotion of Science and Technology) (June-August 2010)

Trainings and Workshops:

- Training on “Entrepreneurship in Higher Education”, IBA-CED, November 16th and 17th 2023
- 2-day BIC Master Trainer by i2i and HEDP, Kinnaird College for Women, Lahore (9th and 10th February 2023)
- 3-day BIC Training by i2i and HEDP-HEC in Daftarkhwan, Lahore, Pakistan, 10th-12th November 2022
- 3-day Training on incubation and business management by GRASP, ITC, Marriott, Karachi, August 2022
- ORIC Training on: “The Role Of ORIC In Line Of University & HEC Guidelines”, 28th February 2022
- ORIC Training on: “Writing Research Grants: National and International: Practices and Experiences”, 28th February 2022
- ORIC Training on: “Filing Patents and IP Policy”, 28th February 2022
- ISF Focal Persons training on “**Innovator Seed Fund**”, HEC Islamabad, 29th December 2021
- Entrepreneurship for Engineers, organized by PEC (1.0 CPD), 10th March 2021
- Learning Management System Training sessions, March 2020 onwards
- OBE based student evaluation, 7th January 2020, QEC
- Development of SAR as per PEC guidelines, January 2020, QEC
- Examination Paper setting as per OBE system, 31st December 2019, QEC
- Intellectual Property and Patents Laws in Pakistan, November 2019, QEC
- OBE System Design, 29th Nov 2017, QEC
- Awareness Session on Transition to ISO 9001: 2015, 18th Oct 2017, ISO
- HEI Ranking QA through IPE, 25th July 2017, QEC
- Quality Assurance in Education, 17th and 18th May, 2017, QEC
- IRCA Registered Lead Assessor, LRQA, conducted by Mr. Raheel Ehsan, 24th-28th April 2017, ISO
- National Instruments, RF and Microwave Symposium, 09th February 2017, Karachi
- Development of Self-Assessment Report (SAR), 01st February 2017, QEC
- Supply Chain Management, 23th to 26th January 2017, ISO
- Procedure of Assessment of SAR, 06th March 2017, QEC
- Effective Teaching Methodologies and Outcome Based Education Trainings, QEC
- Huawei Training on Advance GSM Equipment (NSS and BSS), UET Lahore, July 2010
- 2-Day Training on FPGA Programming, Department of Electronic Engineering, June 2010

- Interface- a Telco resource firm, course on “Level-I Cellular Communication”, September 2007 to October 2007
- Telecom foundation Manpower and Training course on “ Wireless Local Loop”, January 2007 to April 2007

Project Activities:

Worked as Idea Owner, Architect and Internal Advisor of several Final Year Projects. As Advisor and Idea Architect, my responsibilities included: Project Management, Risk analysis and Management, Timeline Management, Step by step critical evaluation of the Project phases and testing for bugs, Technical Guidance to the team members, Technical assessment of all the documentation

- **Lecturer at National University of Computer and Emerging Sciences, Karachi** August’09-April’10
- **Lab Engineer at National University of Computer and Emerging Sciences, Karachi Campus** August’08-July’09
 - Conducted Laboratory Sessions of Various Telecommunication Engineering Courses
 - Worked as Lab In-charge of two Laboratories over the tenure
 - Invigilation duties in Semester Mid-Terms and Final Examinations, Students’ Evaluation for Lab Courses

TOOLS AND SOFTWARES:

Programming Skills	Application Software Skills
<ul style="list-style-type: none"> ▪ LabView (Intermediate) ▪ Communication Systems Design Suite (Advance) ▪ C++ (Medium) ▪ TCL Scripting (Basic) ▪ MATLAB (Advanced) 	<ul style="list-style-type: none"> ▪ EndNote (Advance) ▪ LaTeX (Advance) ▪ MS Visio (Medium) ▪ Wireshark Protocol Analyzer (Medium) ▪ Cisco Packet Tracer (Medium) ▪ MRTG (Basic) ▪ MS Word, MS PowerPoint and MS Excel (Advance)

ACHIEVEMENTS:

- First Position and Academic Excellence Award Recipient, M.Engg. Telecommunications Engineering (2010)
- Worked as an external examiner in Theory/Practical Exam of NEDUET Electrical Engineering Department (2009)
- Third Position in BS Telecommunication Engineering (2008)
- Member of the Dean’s List since 2005
- Member of Software, Information Books and Seminar Society (SIBSS) of FAST-NUCES (2004-2005)
- Member of PROGRAMMING COMPETITION ’05 Marketing Team, 2005
- Editor, English Team, College magazine, 2004

FINAL YEAR PROJECT:

Commissioning of Mobile Switching Centre (MSC) using Huawei CSOFTX3000 and UMG8900 in V-Wireless WLL Network

Salient Features:

The project was regarding the arrival of R4 Network Architecture in Pakistan. It involved:

- Complete deployment of Huawei Mobile Softswitch and Media Gateway in the V-Wireless PTCL Pak-Capital Exchange
- Performance and comparative analysis involving the vendor’s equipment and Operator’s deployment strategies
- Recommended solution for deployment for better network performance

Project Based Learning:

Core Network Technologies and Evolution	Hardware Setup and configuration
Bearer and Signaling Protocols	Software configuration
Signaling and Bearer Network configuration	Troubleshooting Scenarios
TDM/IP conversion of Voice and SS7 messages	Work on Local Maintenance Terminal Software

OTHER TRAININGS:

- WLL Systems and Technologies (From: PTCL Telecom Foundation)
- GSM (Architecture, BSS, NSS, SS7 Signaling Suite, RF Planning) and CDMA (From: Interface-a Telco Resource Firm)

INTERNSHIPS:

- Pakistan Telecommunications Limited (PTCL), 2008 in WLL department, Pak Capital Exchange
 - This Internship was a part of the Final Year Project which involved working on the Softswitch equipment, its configuration and other tasks.
- PIA (July 2007)
- This internship involved learning at various sections in the Engineering Department of the organization including Instrument Overhaul Shop, Radio Overhaul Shop, Communication Section, Electrical Overhaul Shop, Boeing and Airbus Line Maintenance Hangars
- National Bank of Pakistan in various departments July 2006