

PROF. DR. IRFAN AHMED

Professor

Telecommunication Engineering Department

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EDUCATION

- **PhD** (Electrical Engineering) **2011**
Michigan Technological University, Houghton MI, USA.
- **M. E.** (Electrical Engineering) **2005**
NED University of Engg. & Tech. Karachi Pakistan
- **B. E.** (Electrical Engineering) **1994**
NED University of Engg. & Tech. Karachi Pakistan

EXPERIENCE

Academic:

- NED University of Engg. & Tech. Karachi Pakistan
Professor **2025-to date**
- NED University of Engg. & Tech. Karachi Pakistan
Associate Professor **2012-2025**
- NED University of Engg. & Tech. Karachi Pakistan
Assistant Professor **2005-2012**
- NED University of Engg. & Tech. Karachi Pakistan
Lecturer **2001-2005**

Industrial / Administrative:

- NED University of Engg. & Tech. Karachi Pakistan
Chairman Department of Physics **2020 to date**
- NED University of Engg. & Tech. Karachi Pakistan
Controller of Examination **2015- 2017**
- Black & Veatch International (US based), Karachi
Electrical Engineer **1996-2001**
Startup & Commissioning of Power Plant E & I Equipment
- Zelin (Pvt) Ltd.
Electrical Engineer **1994-1996**
Estimation, Costing, and Bidding of Turnkey Projects

PUBLICATIONS

- List at the end, <https://orcid.org/0000-0003-3629-5034>

GRANTS

- Sindh Higher Education Commission-SRSP 2023-24
 - CO-PI, “Mob-Air: Indigenously developed mobile air quality monitoring system for public health and safety” Amount: 3.4M ,Proposal No.24/18
- Higher Education Commission-NRPU
 - CO-PI, “NB-IoT ProSe: Proximity Services enabled NB-IoT for Reliable and Critical Communication in Low-Powered Applications” Amount: 6.9M, Project No.17060,2021
 - CO-PI, “Flexible Testbed for device-to-device (D2D) communication in 5G cellular Network” Amount: 6.5M Project Number: 6054, 2018-19
- MOST Endowment Fund
 - PI, Routing Reliability Improvement in IoT-based-MANET, 3.0 Million, 2020
- Funded by National Technology Fund Program-IGNITE
 - 'Development of IoT Weather Station with NED Local MQTT broker and Dashboard'- 2024
 - Smart Metering Using Power Line Communication 2020
 - Automatic Controlling and Monitoring of Underwater Environment System **2019**
- Funded by National Grassroots ICT Research Initiative of National ICT R&D Fund
 - Design & Fabrication of Wireless System Based Smart Wheelchair **2016**
 - Design & Fabrication of Wearable Antenna for BAN **2015**
 - Design & Fabrication of a Patch Antenna on Non-Conventional substrate **2013**

POSTGRAD STUDENT SUPERVISION

Degree / Role	Successfully Supervised	Successfully Co-supervised	Currently Supervising	Currently Co-Supervising
PhD	04	01	02	01
Master's Thesis	10	02	01	-

AWARDS

- Dean's Award of Outstanding Scholarship, Michigan Tech USA **2011**
- Doctoral Finishing Fellowship, Michigan Tech USA **2011**
- Faculty Development Fellowship for PhD, NED University Karachi **2007**

COMMUNITY WORK

- Member “IGNITE Review Panel for Communication/Telecom Technologies” **2023**
- Member “National Curriculum Review Committee” of Higher Education Commission Pakistan for the subject of Telecom Engineering, **2014-15**
- Member “National Curriculum Review Committee” of Higher Education Commission Pakistan for the subject of Telecom Systems, **2013-14**
- Member Technical Committee of Pakistan Standard Quality Control Authority for “Telecommunications and Information Exchange between Systems (I.C.T-TC-1)” **2013**
- Reviewer for research articles in the following journals

- IEEE (Antennas and Wireless Propagation Letters, Access)
- Ad Hoc & Sensor Wireless Networks
- Progress in Electromagnetic Research (PIER, PIER B,C,M, PIER Letters)

RESEARCH INTERSESTS

- Antenna Design, Electromagnetic Compatibility, Wireless Channel Modeling, Wireless Local Positioning System, WSNs, Green Energy / Alternate Energy.

LANGUAGES

- Urdu, English, Sindhi, Punjabi

MEMBERSHIPS

- Life Member, Pakistan Engineering Council
- Fellow Pakistan Academy of Engineering
- Member American Physical Society

LIST OF PUBLICATIONS

Journal Publications:

S. No.	Description
29	Ayesha Urooj, Sundus Ali, Irfan Ahmed et al. Proximity service for vehicular passengers: modeling and analyzing D2D implementation for VoIP application using vehicular mobility models. <i>Ann. Telecommunications</i> . (2025). https://doi.org/10.1007/s12243-025-01101-4
28	Tahniyat Aslam, Irfan Ahmed , Sundus Ali, "Analysis of User Association in Multi-Tier, Multi-Band Heterogeneous Cellular Networks". <i>Telecommunication Systems</i> , Springer, Issue 88, 8 (2025), Print ISSN: 1018-4864, Electronic ISSN: 1572-9451 https://doi.org/10.1007/s11235-024-01248-w
27	Ali, A. K. M. S., Ahmed, I., Ali, S., & Khalid, M. (2024), "Gain Enhancement of Patch Antenna using Novel Glass Fiber Reinforced Polymer (GFRP) based Metasurface", <i>Advanced Electromagnetics</i> , 13(3), 10–18. https://doi.org/10.7716/aem.v13i3.2273
26	Jafri, S. T. A., Amin, S. R., Amanat, F., Aslam, T., Ali, S., Irfan Ahmed & Aslam, M. I. (2024). "Development of Narrow Band Internet of Things Testbed for Proximity Services." <i>International Journal of Innovations in Science & Technology</i> , 6(7), 146–157
25	Mariam, H., Fiza, G., Ali, S., Irfan Ahmed , Aslam, M. I., & Shakir, M. Z. (2024). "Exploiting Internet of Things to address climate change: Case study and analysis on the perception of stakeholders in Pakistan." <i>Journal of Climate and Community Development</i> , 3(2), 264-285.
24	Jafri, Syed Talib Abbas, Irfan Ahmed , Sundus Ali, Jamaiah Yahaya, Faizan Qamar, and Zuriani Hayati Abdullah. 2023. "Split Hop Penalty for Transmission Quality Metrics in a Better Approach to Mobile Ad Hoc Networking (BATMAN) for IoT-Based MANET" <i>Symmetry</i> 15, no. 5: 969. https://doi.org/10.3390/sym15050969
23	Mariam, Hira, and Irfan Ahmed . 2023. "Performance of Dense Millimeter Wave Network with Uniform Cylindrical Array" <i>Engineering Proceedings</i> 32, no. 1: 8. https://doi.org/10.3390/engproc2023032008
22	Jafri, Syed Talib Abbas, Irfan Ahmed , Sundus Ali, and Faizan Qamar. 2023. "Analysis of AgRED Performance in LR-WPAN Dense Ad-Hoc Networks" <i>Engineering Proceedings</i> 32, no. 1: 5. https://doi.org/10.3390/engproc2023032005
21	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed , "Impact of fractional power control on downlink uplink decoupled-based HetNets in varying path loss exponent environment" <i>Transactions on Emerging Telecommunications Technologies</i> 2022; e4491. doi:10.1002/ett.4491
20	Jafri, Syed Talib Abbas, Irfan Ahmed , and Sundus Ali. 2022. "Queue-Buffer Optimization Based on Aggressive Random Early Detection in Massive NB-IoT MANET for 5G Applications" <i>Electronics</i> 11, no. 18: 2955. https://doi.org/10.3390/electronics11182955

19	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed and Attaullah Khawaja. "Uplink Performance of Narrowband Internet-of-Things Devices in Downlink–Uplink Decoupled-Based Heterogeneous Networks". <i>Iranian journal of science and technology-transactions of electrical engineering</i> (2022). https://doi.org/10.1007/s40998-022-00570-w
18	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" <i>Electronics</i> 11, no. 24: 4226. https://doi.org/10.3390/electronics11244226
17	Mariam, Hira, Irfan Ahmed , and Muhammad Imran Aslam. 2022. "Impact of Multiple Beams and Mobility-Based Beam Alignment Error on Millimeter Wave Communication" <i>Engineering Proceedings</i> 20, no. 1: 42. https://doi.org/10.3390/engproc2022020042
16	Mumtaz, T., Muhammad, S., Aslam, M.I. and Irfan Ahmed , "Inter-slice resource management for 5G radio access network using markov decision process". <i>Telecommunication Systems</i> , Springer (2022). https://doi.org/10.1007/s11235-021-00877-9
15	Hira Mariam, Irfan Ahmed , Muhammad Imran Aslam, "Coverage probability of uplink millimeter wave cellular network with non-homogeneous interferers' point process" <i>Physical Communication</i> , Volume 45, 16 January 2021, 101274, ISSN 1874-4907, https://doi.org/10.1016/j.phycom.2021.101274
14	A. K. M. Shafaat Ali and Irfan Ahmed , "Electrical characterization of glass fiber reinforced polymer (GFRP) composites for future metasurface antenna applications", <i>Materials Research Express</i> , ISSN 2053-1591 Volume 8, Number 6, 02 June 2021, https://doi.org/10.1088/2053-1591/ac02fe
13	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed et al., "Analysis of the decoupled uplink downlink technique for varying path loss exponent in multi-tier HetNet." <i>Telecommunication Systems</i> , Springer, Issue 4/2020 Print ISSN: 1018-4864, Electronic ISSN: 1572-9451 https://doi.org/10.1007/s11235-020-00661-1
12	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed , "Analysis of Downlink Uplink Decoupled Dense Heterogeneous Cellular Network based on User Association using Multi-Slope Path Loss Model," <i>Advances in Electrical and Computer Engineering</i> , vol.19, no.2, pp.45-52, 2019, doi:10.4316/AECE.2019.02006
11	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed , "Uplink coverage probability and spectral efficiency for downlink uplink decoupled dense heterogeneous cellular network using multi-slope path loss model". <i>Telecommunication Systems</i> , Springer, Issue 4/2019, Print ISSN: 1018-4864, Electronic ISSN: 1572-9451, https://doi.org/10.1007/s11235-019-00587-3
10	Muhammad Usman, Irfan Ahmed , Muhammad I. Aslam, Shujaat Khan, and S. M. Usman Ali, "SIT: A Lightweight Encryption Algorithm for Secure Internet of Things" <i>International Journal of Advanced Computer Science and Applications (IJACSA)</i> , Vol. 8, no. 1, pp-402-411, 2017. https://dx.doi.org/10.14569/IJACSA.2017.080151
9	Muhammad Sohail Ibrahim, Irfan Ahmed , Muhammad I. Aslam, Muhammad Ghazaal, Muhammad Usman, Kamran Raza and Shujaat Khan, "A Low Cost FPGA based Cryptosystem Design for High Throughput Area Ratio" <i>International Journal of Advanced Computer Science and Applications (IJACSA)</i> , Vol. 8, no. 2, pp-385-393, 2017, https://dx.doi.org/10.14569/IJACSA.2017.080249
8	Tahniyat Aslam, Irfan Ahmed , Muhammad I. Aslam, Syed M. Usman Ali, Tahir Malik, "Direction of Arrival Estimation in the presence of Scatterer in noisy environment", <i>Advanced Electromagnetics</i> , Vol. 6, no. 3, pp.33-40, 2017. https://doi.org/10.7716/aem.v6i3.525
7	Akhtar Saeed, Irfan Ahmed , Muhammad Imran Aslam, and Tahir Malik, "Improving Energy Efficiency of Wireless Sensor Network through Optimum Selection of Cluster Heads", <i>BUJCT Journal</i> , Volume 10, Issue 1, June 2017, pp. 29-37.
6	Immad Girach, Muhammad I. Aslam, Irfan Ahmed , Syed M. Usman Ali and Muhammad Khalid, "Photonic Band Gap Materials- Theory, Techniques and Application," <i>Bahria University Journal of Information & Communication Technologies</i> , Vol. 8, No. 1, pp. 126-129, 2015.
5	Sana Aijaz, Irfan Ahmed , Muhammad I. Aslam, and Syed M. Usman Ali, "Spectrum Sensing in Cognitive Radios - Techniques, Issues and Challenges," <i>International Journal of Information and Communication Technology Trends</i> , Vol. 2, No. 1, pp. 1-4, 2015.
4	Irfan Ahmed and Warren F. Perger "Effect of Ground on Antenna Mutual Impedance for DOA Estimation Using Dipole Arrays" <i>Progress in Electromagnetics Research (PIER C)</i> , Vol. 46, page 179-185, 2014
3	Akhter Saeed, Irfan Ahmed , "Wireless Sensor Networks – A Comprehensive Study," <i>International Journal of Information and Communication Technology Trends</i> , Vol. 1, 2014.
2	Irfan Ahmed and Warren F. Perger "Direction Finding in the Presence of Near Zone Resonant Size Scatterers", <i>Progress in Electromagnetics Research (PIER B)</i> , Vol. 56, page 219-234, 2013

1	Irfan Ahmed , Warren F. Perger, and Seyed A. Zekavat, "Effects of Ground Constituent Parameters on Array Mutual Coupling for DOA Estimation," <i>International Journal of Antennas and Propagation</i> , vol. 2011, Article ID 425913, 5 pages, 2011. doi:10.1155/2011/425913
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Conference Publications:

21	Syed Talib Abbas Jafri, Irfan Ahmed et. al. "Development of narrow band internet of things testbed for proximity services" International Conference on Computing Research (ICCoR 2024)
20	S. Ali, M. I. Aslam, Irfan Ahmed , S. T. A. Jafri and T. Aslam, "Development of a novel OMNET++ framework for analysis of an NB-IoT uplink network," <i>2024 International Conference on Emerging Trends in Smart Technologies (ICETST)</i> , Karachi, Pakistan, 2024, pp. 1-4, doi: 10.1109/ICETST62952.2024.10737960.
19	T. Aslam, Irfan Ahmed , S. Ali and M. I. Aslam, "TeraHertz Communication and Associated Challenges in 6G Cellular Networks," <i>2021 4th International Conference on Computing & Information Sciences (ICCIS)</i> , 2021, pp. 1-6, doi: 10.1109/ICCIS54243.2021.9676382.
18	A. Danish, S. Ali, M. I. Aslam and Irfan Ahmed , "Future prospects and challenges associated with intelligent reflecting surfaces enabled wireless communication," <i>2021 IEEE 18th International Conference on Smart Communities: Improving Quality of Life Using ICT, IoT and AI (HONET)</i> , 2021, pp. 121-125, doi: 10.1109/HONET53078.2021.9615389.
17	Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed et al., "Performance Analysis of Single-Hop Device to Device Communication," <i>2021 International Bhurban Conference on Applied Sciences and Technologies (IBCAST)</i> , 2021, pp. 974-978, doi: 10.1109/IBCAST51254.2021.9393266.
16	T. Abbas, F. Qamar, M. N. Hindia, R. Hassan, Irfan Ahmed and M. I. Aslam, "Performance Analysis of Ad Hoc on-Demand Distance Vector Routing Protocol for MANET," <i>2020 IEEE Student Conference on Research and Development (SCOREd)</i> , Batu Pahat, Johor, Malaysia, 2020, pp. 194-199, doi: 10.1109/SCOREd50371.2020.9250989.
15	Hasan Rafae, Syed Waqar Jamil, Muhammad I. Aslam and Irfan Ahmed , "Internet of Nano Things: Next Step for Future of Nanotechnology," <i>Proceedings of the 4th International Electrical Engineering Conference</i> , Karachi, 25-26 January, 2019.; Karachi; IEP
14	Hasan Rafae, Muhammad I. Aslam, Irfan Ahmed , Furqan Alam, Syed Waqar Jamil, "Awareness of Green Computing among Students of NED University of Engineering and Technology," <i>First International Conference on Carbon Neutral Built Environment (CNBT-I)</i> , Karachi, Pakistan, 20-21 December 2018.; Karachi; NED University
13	Hasan Rafae, Muhammad I. Aslam, Irfan Ahmed , "Green Computing: Techniques and Challenges," <i>First International Conference on Carbon Neutral Built Environment (CNBT-I)</i> , Karachi, Pakistan, 20-21 December 2018.
12	Tariq Mumtaz, Shahabuddin Muhammad, Nazeeruddin Mohammad, Muhammad Imran Aslam and Irfan Ahmed , "Modeling and Evaluation of Mobility Management in mmWave Cellular Networks", <i>21st IEEE International Multi Topic Conference</i> , Karachi, Pakistan, 1-2 November 2018. Karachi; Hamdard University.
11	Hira Mariam, Muhammad I. Aslam, Irfan Ahmed , "Device-to-Device Communication in Cellular Networks: A Survey," <i>International Conference on Emerging Trends in Telecommunication and Electronic Engineering</i> , 27 - 28 February 2018, Karachi.
10	Talib Abbas, Faizan Qamar, Irfan Ahmed , Kaharudin Dimiyati, Mohammed B. Majed "Propagation Channel Characterization for 28 and 73GHz Millimeter-Wave 5G Frequency Band" <i>IEEE Scored Putrajaya</i> , Malaysia December 2017
9	Faizan Qamar, Talib Abbas, MHD Nour Hindia, Kaharudin Bin Dimiyati, Kamarul Ariffin Bin Noordin, Irfan Ahmed , "Characterization of MIMO Propagation Channel at 15 GHz for the 5G Spectrum," <i>2017 IEEE 13th Malaysia International Conference on Communications (MICC)</i> , 28-30 Nov. 2017, The Puteri Pacific, Johor Bahru, Malaysia.
8	Zaheer Abbas Balouch, Muhammad I. Aslam, Irfan Ahmed , "Energy Efficient Image Encryption Algorithm" <i>International conference on Innovations in Electrical Engineering and Computational Technologies</i> , Karachi, Pakistan, April 2017.
7	Sundus Ali, Muhammad I. Aslam, Irfan Ahmed , "MIMO channel modeling and capacity analysis using 3-D Spatial Statistical Channel Model for Millimeter Wave Outdoor Communication," <i>14th International Bhurban Conf. on Applied Sciences and Technology</i> , Islamabad, Pakistan, January 2017

6	Rana Khan, Tehzeb Jamal, Muhammad I. Aslam, Irfan Ahmed , “Comparative Analysis of Different Patch Antennas”, <i>Proceedings of the 1st International Electrical Engineering Congress</i> , Karachi, 13-14 May, 2016.
5	Usama Fareed Ahmad, Muhammad ShahRukh Khan, Muneeb ur Rahman, S.M. Daniyal Hasan Shah, Irfan Ahmad , and Muhammad I. Aslam, “Wireless System Based Smart Wheelchair”, <i>Proceedings of the 1st International Electrical Engineering Congress</i> , Karachi, 13-14 May, 2016.
4	Sundus Ali, Muhammed I. Aslam, Irfan Ahmed , “Analysis of Proportional Fairness Utility Function and Interference Mitigation in Heterogeneous Cellular Networks”, <i>31st IEEE Multi-topic International Symposium</i> , Karachi, 16th-17th March 2016.
3	Radha Mohanlal, Muhammad I. Aslam, Irfan Ahmed , “Radio resource allocation techniques for downlink transmission in LTE-Advanced”, <i>4th International Conference on Electrical, Computer, Mechanical and Mechatronics Engineering (ICE2016)</i> , Dubai, Emirates, 4-5 February 2016,
2	Shafaq Mustafa, Muhammad I. Aslam, Irfan Ahmed , “Analysis of Electromagnetic Wave Propagation through Photonic Crystal Fibers,” <i>International Conference on Advanced Materials and Process Engineering</i> , Karachi, 14-15 December, 2015.
1	Syed Asad Ali Shah, Muhammad I. Aslam, Irfan Ahmed , and Syed M. Usman Ali1, “Near-Perfect Metamaterial Absorber for the Visible Spectrum,” <i>International Conference on Advanced Materials and Process Engineering</i> , Karachi, 14-15 December, 2015.

Book Chapters:

1	Seema Ansari, Tahniyat Aslam, Adeel Ansari, Pablo Otero, Irfan Ahmed , and Fatima Maqbool, "Internet of Things: Technologies and Applications," in <i>Introduction to Internet of Things in Management Science and Operations Research: Implemented Studies</i> , A. Editor, Fausto Pedro García Márquez, Benjamin Lev. Springer Nature, 2021 pp. 1-30.
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