DR. HIRA MARIAM

Assistant Professor
Department of Telecommunications Engineering
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PROFESSIONAL SUMMARY:

Experienced Academic in Telecommunications Engineering with 13+ years of teaching expertise in signal processing, digital communication, and wireless systems. Research interests include 5G/6G communication, internet-of-things networks, robotic communication and AI/ML applications in wireless networks. I am committed to enhancing student engagement through innovative teaching methods, project-based learning and industry collaborations.

EDUCATION:

PhD Electronic Engineering, NED University of Engineering and Technology, 2016-2021
Dissertation: Uplink Performance Analysis of Millimeter wave in Heterogeneous Cellular Network
CGPA: 3.8/4.00

Key Contributions: Development of an analytical model for urban outdoor millimeter wave cellular network to characterize the impact of network parameters such as base station density, load per base station, system bandwidth and power control factor on system performance metrics such as signal-to-interference-and-noise ratio (SINR) coverage probability, rate coverage probability and area spectral efficiency (ASE). The developed framework studies the effect of both building and human blockage on the system performance.

M.Engg. Telecommunications Engineering, NED University of Engineering and Technology, 2009-2011
Dissertation: Performance Analysis of Energy-Efficient MAC Protocols for Wireless Sensor Networks
CGPA: 3.73/4.0

B.E. Telecommunications Engineering, NED University of Engineering and Technology, 2005-2008
Final Year Project: To study IEEE 802.16e (Mobile WIMAX) with emphasis on end to end architecture. (Includes in depth study of wireless spectrum, end-to-end architecture and its applications)
Percentage: 87.8%

HSC (BIEK), Pre-Engineering, BAMM PECHS Govt College for Women, 2002- 2004
Grade A-1 (86.8%)

SSC (BSEK), Computer Science, St. Paul's English High School, 2000-2002
Grade A-1(86%)

TEACHING EXPERIENCE & ADMINISTRATION:

Assistant Professor, Department of Telecommunications Engineering (July 2022 to date)

Assistant Professor (Adhoc), Department of Telecommunications Engineering (December 2021 to July 2022)

Lecturer, Department of Telecommunications Engineering, NEDUET (June 2021 to December 2021)

Lecturer, Department of Electronic Engineering, NEDUET (Dec 2009 – June 2021)

Undergraduate/Postgraduate Teaching Experience

- Taught various undergraduate and postgraduate courses
  - Wireless Technologies and RF Planning (Final Year Telecommunications Engineering)
  - Communication Systems (Third Year Electrical/Telecommunications Engineering)
  - Signals and Systems (Second Year, Electronic Engineering)
  - Digital Signal Processing (Third Year Electronic Engineering)
  - Wireless Communication (Laboratory, Third Year Telecommunications Engineering)
  - Digital Communication and Information Theory (Third Year Telecommunications Engineering)
  - Advanced Analog and Digital Communication (MS-Telecommunications Engineering)
- Supervised undergraduate projects
- Contributed to course profile development, course learning outcomes assessments and continuous quality improvements

Administrative Experience

- Departmental Outcome Based Education Team Member (Identifying Corrective Actions, Continuous Quality Improvement at Cohort Level)
- Lab Incharge Antenna and Microwave Engineering Laboratory
- Student Counsellor
- Faculty Coordinator: TE-Links- Official Telecom Discussion Forum of NED UET
- Responsibility for planning and organising conferences as secretary and coordinator
- Quality Auditor

PROFESSIONAL MEMBERSHIP:

- Pakistan Engineering Council
- The Institution of Engineers, Pakistan

PUBLICATIONS:

- **H Mariam**, G Fiza, S Ali, I Ahmed, MI Aslam, MZ Shakir - Journal of Climate and Community Development, 2024
- Zainab Fatima, M. Hassan Tanveer, **Hira Mariam**, Razvan Cristian Voicu, Tanazzah Rehman and Rizwan Riaz, "Performance Comparison of Object Detection Models for Road Sign Detection Under Different Conditions" International Journal of Advanced Computer Science and Applications(IJACSA), 15(12), 2024. http://dx.doi.org/10.14569/IJACSA.2024.0151299
- Tanveer, Muhammad Hassan, Zainab Fatima, **Hira Mariam**, Tanazzah Rehman, and Razvan Cristian Voicu. 2024. "Three-Dimensional Outdoor Object Detection in Quadrupedal Robots for Surveillance Navigations" Actuators 13, no. 10: 422. https://doi.org/10.3390/act13100422
- **H. Mariam**, I. Ahmed, S. Ali, M. I. Aslam, and I. U. Rehman, "Performance of Millimeter Wave Dense Cellular Network Using Stretched Exponential Path Loss Model," *Electronics*, vol. 11, no. 24, p. 4226, Dec. 2022, doi: 10.3390/electronics11244226 [Impact Factor: 2.69]
- **Hira Mariam**, Irfan Ahmed, Muhammad Imran Aslam, "Coverage Probability of Uplink Millimeter Wave Cellular Network with non-Homogeneous Interferers' Point Process," Physical Communication, Vol. 45, p. 101274, April 2021. DOI: https://doi.org/10.1016/j.phycom.2021.101274 [Impact Factor: 1.594]
- **Mariam, Hira**, and Irfan Ahmed. 2023. "Performance of Dense Millimeter Wave Network with Uniform Cylindrical Array" *Engineering Proceedings* 32, no. 1: 8. https://doi.org/10.3390/engproc2023032008
- **Hira Mariam**, Muhammad Imran Aslam, Irfan Ahmed, "Impact of Multiple Beams and Mobility based Beam Alignment Error on Millimeter Wave Communication", 7th International Electrical Engineering Conference, Karachi, Pakistan, March 25 - 26, 2022, https://doi.org/10.3390/engproc2022020042
- Sundus Ali, Muhammad Imran Aslam, Irfan Ahmed and **Hira Mariam**, "Device-to-Device Communication Prototyping using Software Defined Radios", IEEC, Karachi, Pakistan, February 2020
- **Hira Mariam**, Muhammad Imran Aslam, Irfan Ahmed, "Device-to-Device Communication in Cellular Networks: A Survey", International Conference on Emerging trends in Telecommunication and Electronics Engineering, Karachi, Pakistan, February 27 - 28, 2018

SHORT COURSES AND RESEARCH PROJECTS:

1. Digital Transformation in Engineering by Pakistan Engineering Council
2. Fundamentals of Deep Learning by NVIDIA Deep Learning Institute
3. Digital Transformation and Impact of IOT on Education, Industry, Health Sector, and Society Towards Creating Job Opportunities by Pakistan Engineering Council
4. Cellular Networks (2G to 5G Technology): Future Applications by Pakistan Engineering Council
5. High Impact Skill Bootcamp, Data Science (Machine Learning & Artificial Intelligence) by Ministry of Information Technology & Telecommunications
6. Team Member, "PAK-UK Education Gateway Mobility Partnership for Faculty" supported by British Council and Higher Education Commission, Pakistan

RESEARCH INTERESTS:

Wireless communications (5G, 6G), joint communication and sensing, artificial intelligence and deep learning in wireless networks, robotics and internet-of-things communication.

SOFTWARE AND PROGRAMMING SKILLS:

- MATLAB (Advance)
- EndNote/Mendeley/JabRef (Advance)
- LaTEX (Advance)
- MS Word, MS PowerPoint and MS Excel (Advance)
- Python/Jupyter Notebook/Colab/Tensorflow/Keras/Scikit-learn/ PyTorch and Pandas libraries (Advance)