



ARIF HUSSAIN

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CAREER SUMMARY

Prospective Ph.D. candidate with 7+ years research and teaching experience in sustainable sensing, intelligent systems, autonomous navigation and machine learning frameworks. Building upon my interdisciplinary research experience and technical expertise, I aspire to contribute to a healthier, environmentally conscious, and sustainable society by developing AI-driven solutions.

RESEARCH INTEREST(S)

- AI-Driven Environmental Sensing & Monitoring
- IoT-based Intelligent Systems
- Energy Efficient Digital and Embedded Systems
- Low-cost Sensor Systems (LCS)

EDUCATION

Master of Engineering in Electrical Engineering

2018-2020

Sukkur IBA University, Sukkur, Pakistan

CGPA: 3.77/4.00 (*Gold Medalist*)

Bachelor of Engineering in Electrical

2013 – 2017

Sukkur Institute of Business Administration, Sukkur, Pakistan

CGPA: 3.50/4.00 (*Silver Medalist*)

English Language Proficiency

- **IELTS Academic (Oct 2025): Overall Band 6.5** (Listening: 7.0, Speaking: 7.0, Reading: 6.5, Writing: 6.0)

PROFESSIONAL EXPERIENCE

BBS University of Technology and Skill Development

Feb 09, 2022 – Present

Lecturer - Electronics Engineering Technology

Khairpur Mirs, Pakistan

- Teaching Bachelors' courses, conducting hands-on practical sessions, supervising student projects and collaborating with an interdisciplinary research team to study environmental degradation & develop IoT-based solutions.
- **Courses Taught:** Embedded Systems (EST-321), Artificial Intelligence (EST-411), Instrumentation and Control (MET-311), Digital Signal Processing (EST - 413), Sensors and Microcontrollers (EST-222).
- **Final Year Projects Supervised and IGNITE National Technology Fund Awarded**
 - * Design & Development of Smart Air Quality Monitoring System (NGIRI-2024-28181)
 - * Smart Therapeutic Glove for Stroke Rehabilitation
 - * Dual Syringe Smart Infusion Pump with Real-Time Health Monitoring (NGIRI-2022-13176)
- **Research Project(2025-26): SINDH AIRQ: Smart Air Quality Monitoring (SAQM) – A Data-driven approach to Protect Public Health and the Environment in Rural Sindh**

Sukkur IBA University

Jan 04, 2018 – Feb 07, 2022

Research Associate - Engineering - HEC NRPV

Sukkur, Pakistan

- Actively contributed to a 3-year research project funded by the Higher Education Commission of Pakistan (HEC Grant No. 6250/Sindh/NRPV) aimed to establish GNSS and Space Weather Lab at Sukkur IBA and investigate potential vulnerabilities of satellite-based navigation systems in diverse range of environments and develop efficient mitigation strategies for improved navigation performance. [Video Link](#).

Sukkur IBA University

Jan 04, 2018 – Jan 03, 2019

Research Assistant

Sukkur, Pakistan

- Successfully deployed Satellite-Based Ionospheric Scintillation Monitoring Station at Sukkur IBA University.
- Acquired, processed and analyzed GNSS satellite signals for one complete year to analyze ionospheric scintillation occurrence patterns and TEC variations over Pakistan.

TECHNICAL EXPERTISE

- IoT-based Intelligent System Design
- Machine Learning and Deep Learning Frameworks: TensorFlow, PyTorch, Keras, scikit-learn.
- **Programming Language(s):** Assembly Language, C/C++, Java, VHDL, R and Python.
- **Software(s):** MATLAB, LabVIEW, Arduino IDE, Node-RED, ThingSpeak, MQTT Explorer, Tableau and ArcGIS.
- **Hardware Tool(s):** NodeMCU, Raspberry Pi, Microcontrollers, NI myRIO and FPGA.
- **Cloud Computing Platform(s):** ThingSpeak, AWS IoT and Azure IoT.
- Sensor Fusion, Complex Data Handling & Visualization
- **Advanced Signal Processing:** Spatio-temporal Analysis, Anomaly Detection, Domain Transformations (e.g., Fourier, Wavelet), Filtering (e.g., Kalman, Wiener).

HANDS-ON TRAININGS & WORKSHOPS CONDUCTED

- **Real-Time Air Pollution Monitoring, Source Profiling & Predictive Modelling** March 05, 2026
- **Building Smart IoT Systems Using PYNQ FPGA** December 10–11, 2025
- **Design & Development of Intelligent Systems**, MUET SZAB Campus November 04–05, 2025
- **Robotics, AI, and Industry 4.0 – Hands-on Workshop**, Lincoln Corner November 20, 2025
- **IoT-Based Intelligent Systems Training Session**, BBS-UTECH, Khairpur Mirs October 15–17, 2025
- Facilitated technical sessions on **VHDL, Embedded C, and Python** for 100+ participants. 2024 – 2025

PROFESSIONAL DEVELOPMENT

- **National Faculty Development Program**, National Academy of Higher Ed. Jan – Feb 2025
- **Google Data Analytics – Professional Certificate** Sept – Dec 2025
- **Online Education Faculty Capacity – Erasmus+ CBHE RAPID Project** February 08, 2025
- **STEAM Education Development – UK-Pakistan Science/Innovation Network** July 29–30, 2024
- **Climate Change AI (CCAI) – Virtual Summer School** June – August 2024
- **Remote Sensing & GIS Summer School (AI/ML focused) – IST Islamabad** June 19–23, 2023
- **Deep Learning Winter School – Sukkur IBA University** December 25–29, 2023
- **Academic Leadership & Research Advance Training – Univ. of Kentucky** June – Sept 2022
- **IoT and Embedded Systems – Coursera (UC Irvine)** April 05, 2020
- **Embedded Control & Monitoring using LabVIEW – National Instruments** April 19, 2020
- **1st PPRS Autumn School on Deep Learning (UAVs & Vision)** October 06–08, 2018

HONORS & AWARDS

- Awarded with **Gold Medal** in Masters' Degree on securing top-rank March 26, 2022
- Outstanding Research Award for Publishing 6 Research Papers from Thesis work January 23, 2021
- Awarded with Institutional Merit Scholarship for outstanding academic performance February 03, 2020
- Awarded with **Silver Medal** on achieving 2ND Rank in Bachelor's Degree March 10, 2018
- Achieved 3RD Position in Pakistan in IEEEExtreme 8.0 Programming Competition November 08, 2015
- Awarded with 4-Year Talent Hunt Scholarship for Bachelor's Degree August 15, 2013

SELECTED RESEARCH PUBLICATIONS

[h-index:6 , Citations: 218]

1. **Hussain, A.**, Mahar, G. N., Ha, Q. P., Mahar, R. B., & Katyara, S. (2026). *Real-time air pollution profiling, dust storm events analysis and predictive modeling in rural resource-constraint region. Water, Air, & Soil Pollution*. [Manuscript under review. Submission ID: b28f746e-7370-42c7-a00b-fc6dc28e4763]
2. Chen, X., Kanta, S., Koc, V., Punati, S. B., **Hussain, A.**, & Katyara, S. (2025). *SmartCert: A Multi-modal Framework for Automated Vehicle Screening. Pervasive and Mobile Computing*. DOI: 10.1016/j.pmcj.2025.102127
3. **Hussain, A.**, Ahmed, A., Shah, M. A., Katyara, S., Staszewski, L., & Magsi, H. (2022). *On Mitigating the Effects of Multipath on GNSS Using Environmental Context Detection. Applied Sciences*. DOI: 10.3390/app1223123
4. **Hussain, A.**, Ahmed, A., Magsi, H., Soomro, J. B., Bukhari, S. S. H., & Ro, J. S. (2021). *Adaptive Data Length Method for GPS Signal Acquisition in Weak to Strong Fading Conditions. Electronics*. DOI: 10.3390/electronics10141735
5. Ahmed, B., Ali, G., **Hussain, A.**, Baseer, A., & Ahmed, F. (2021). *Analysis of Text Feature Extractors Using Deep Learning on Fake News. Engineering, Technology and Applied Science Research*. DOI: 10.48084/etasr.4069
6. **Hussain, A.**, Ahmed, A., Magsi, H., & Tiwari, R. (2020). *Adaptive GNSS Receiver Design for Highly Dynamic Multipath Environments. IEEE Access*. DOI: 10.1109/ACCESS.2020.9200496
7. **Hussain, A.**, Ali, G., Akhtar, F., Khand, Z. H., & Ali, A. (2020). *Design and Analysis of News Category Predictor. Engineering, Technology and Applied Science Research*. DOI: 10.48084/etasr.3825

Book Chapters

1. Magsi, H., **Hussain, A.**, Shah, S.H.H., Shah, M.A., Abro, S.A., & Ahmed, J. (2024). *Accurate Monitoring and Timely Prediction of Ionospheric Scintillation Using Support Vector Machine*. In *Recent Advancements from Aquifers to Skies in Hydrogeology, Geoecology, and Atmospheric Sciences*. DOI: 10.1007/978-3-031-47079-0
2. Shah, M.A., **Hussain, A.**, Shah, S.H.H., Hussain, I., & **Magsi, H.** (2024). *Improved Navigation Based on Received Signal Quality Monitoring (RSQM)*. In *Recent Advancements from Aquifers to Skies in Hydrogeology, Geoecology, and Atmospheric Sciences*. DOI: 10.1007/978-3-031-47079-0_35

International Conferences Presentation/Proceedings

1. **Hussain, A.**, Azzi, M., & Ha, Q. P. (2026). *Methane emissions: Data-driven assessment, forecasting, and policy evaluation using global emission inventories*. *International Conference on Energy, Infrastructure and Environmental Research (EIER 2026)*. [Manuscript under review. Submission ID: 1571288569]
2. **Hussain, A.** et al. *Real-Time Monitoring and Pollution Profiling: Detailed Assessment of Environmental Injustice in a Resource-Limited Rural Region*. 31st International Conference on Modelling, Monitoring, & Management of Air Pollution, 8–10 June 2026, UK. (Accepted for Oral Presentation). Air Pollution 26
3. **Hussain, A.** et al. *Low-Cost Sensor Systems vs. Interpolation: An Experimental Study of Air Quality Data in a High-Pollution Environment in Pakistan*. 3rd International Multidisciplinary Conference on Emerging Trends in Engineering (IMCEET-25), 28–30 April 2025, Khairpur Mirs, Sindh, Pakistan. IMCEET-25
4. Magsi, H., Shah, M. A., Shah, S. H., **Hussain, A.**, Soomar, A. M., & Chachar, F. A. *Performance Analysis and Quantification of BeiDou Navigation Satellite System (BDS-3)*. 4th International Conference on Computing, Mathematics, and Engineering Technologies (iCoMET-23), 17–18 March 2023, Sukkur, Pakistan. DOI: 10.1109/iCoMET57998.2023.10099200
5. Magsi, H., **Hussain, A.**, Ahmed, A., & Chachar, F. A. *Investigation of Ionospheric Scintillation Using BeiDou during Geomagnetic and Non-geomagnetic Storm Conditions Over Pakistan*. 7th International Conference on Aerospace Science and Engineering (ICASE-21), 14–16 December 2021, Islamabad, Pakistan. DOI: 10.1109/ICASE54940.2021.9904148
6. **Hussain, A.** et al. *An Adaptive GNSS Receiver Design Based on Environment Context Detection*. Mediterranean Geosciences Union Annual Meeting (MedGU-21), 25–28 November 2021, Istanbul, Turkey. MedGU-21
7. Magsi, H., Ahmed, A., & **Hussain, A.** *Real-Time Monitoring and Logging of Ionospheric Scintillation and Total Electron Content*. 6th International Conference on Aerospace Science and Engineering (ICASE-19), 12–14 November 2019, Islamabad, Pakistan. DOI: 10.1109/ICASE48783.2019.9059198
8. **Hussain, A.** et al. *Investigation of Ionospheric Scintillations & TEC over Mid-Latitudinal Region (Pakistan)*. 6th International Conference on Aerospace Science and Engineering (ICASE-19), 12–14 November 2019, Islamabad, Pakistan. DOI: 10.1109/ICASE48783.2019.9059232

REFERENCES

Prof. Dr. Manthar Ali Keerio

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