

# Ashfaq Ahmed

## Curriculum Vitae

Dept. of Computer & Information Engineering,  
Khalifa University,  
Abu Dhabi, UAE  
📞 (+971) 568812319  
✉ ashfaq.ahmed@ku.ac.ae  
🌐 drashfaqahmed.com

### Selected Achievements

- **US Patent No. 12,381,829** (issued Aug 5, 2025): *Dropped-Packets Repair & Recovery for Delay-Tolerant Wireless Systems using Retroactive Interference Cancellation* (retroactive interference cancellation for reliable wireless delivery).
- **57 peer-reviewed publications** including **40 journals (30 Q1, 8 Q2)**, across venues such as *IEEE Internet of Things Journal*, *IEEE Transactions on Vehicular Technology*, and *IEEE Communications Surveys & Tutorials*.
- **PI/Leadership on major grants** including UAV monitoring and secure communications, including **KU RIG-2024 (2024–2027)** and **Saudi RCG (2025–2029)** on RID-based UAV monitoring.
- **Hardware security and reliable communications**: SPDM-based *zero-trust* chip-to-chip authentication; asynchronous NOMA and NOM protocols for high-throughput reliable links.
- **International presence**: Exhibited/presented at *IEEE ISCAS*, *SNAMS*, *IWCMC*, *IROS 2024*, and *TII SSRC Summits*.
- **Professional standing**: *IEEE Senior Member*; reviewer for leading IEEE/Elsevier journals.
- **Best Paper Award** (ITAS 2023) and multiple institutional research, teaching and services awards and honors.
- **Scholarly impact & service**: h-index **18**, i10-index **30**; supervision of PhD/MS theses; contributions to *Washington Accord* accreditation processes.

### Education

- 01/2011– **PhD - Electronics & Communication Engineering**  
02/2014 Politecnico di Torino, Torino, Italy  
Graduation grade: Good.
- 09/2008– **MS - Electronics Engineering**  
11/2010 Politecnico di Torino, Torino, Italy  
Graduation grade: 97/100.
- 08/2003– **BS - Computer Engineering**  
05/2007 Bahria University Islamabad, Pakistan.  
Graduation grade: 3.43/4.00

### Work Experience

- 2022–Present **Postdoc Fellow**, *Center for Cyber-Physical Systems (C2PS)*, Department of Computer & Communication Engineering, Khalifa University, Abu Dhabi, UAE.  
**Responsibilities:**

- o Development of efficient techniques for monitoring commercial UAVs through the fusion of computer vision techniques and RID data..
  - o Development of an SPDM chip ensuring zero-trust security; it authenticates guest chips upon connection to our host system, permitting only verified communications..
  - o Performed formal verification of the SPDM protocol for thorough validation..
  - o Developed a protocol for real-time monitoring of UAVs using remote identification and crowd sensing model.
  - o Developed an estimated heatmap of signal pathloss for Abu Dhabi city for optimal placement of ground sensors to receive remote identification (RID) message from the flying UAVs.
  - o Drafting research proposals for external and internal funding.
  - o Co-Supervising graduate and under-graduate students.
  - o Published research outcomes in prestigious journals..
  - o Teaching one course per year..
- 2020–2022 **Postdoc Fellow**, *Center for Cyber-Physical Systems (C2PS), Department of Computer & Communication Engineering, Khalifa University, Abu Dhabi, UAE.*
- Responsibilities:**
- o Designed asynchronous NOMA protocols with a novel offline packet repair and recovery system for reliable data delivery.
  - o Developed novel non-orthogonal multiplexing (NOM) protocols for high-throughput, reliable data delivery in point-to-point systems, utilizing optimal power allocation and ARQ retransmissions.
  - o Published research outcomes in prestigious journals.
- 2014–2021 **Assistant Professor**, *Department of Electrical & Computer Engineering, COMSATS University Islamabad, Wah Campus, Pakistan.*
- Responsibilities:**
- o Teaching at undergraduate and post graduate level.
  - o Supervision of final year projects of undergraduate students.
  - o Supervision of masters and PhD thesis.
  - o To be involved in the ongoing research activities of the campus.
  - o Securing research grants for establishments of research labs.
  - o To complete all the administrative tasks assigned by the department and the campus administration.
  - o Student's counseling.
  - o Convened the accreditation committee for three years. The program was accredited with Washington accord.
- 2007–2008 **Junior Lecturer** *Department of Computer Engineering, Bahria University, Islamabad, Pakistan.*
- Responsibilities:**
- o To deliver lab lectures to Electronics, Telecommunication, and Computer Engineering undergrad students.
  - o Establishing and maintaining the labs.

## Teaching Experience

Learning management system.

Blackboard Learn

MS/PhD Optimization techniques, Biologically inspired computing, Evolutionary optimization algorithms, ASICs & FPGA design, Simulation & modeling.

BS Image Processing & Analysis, Computer programming, Data structures, Object-oriented programming, Digital logic design, Circuit analysis AC & DC analysis, Microprocessor systems & Interfacing, Probability methods, Signals & systems.

## Courses of Interest

Digital Communications, Cryptography and public key infrastructure, Artificial intelligence, Computer vision.

## Teaching Training

20 Sep 2023 - **Course Title** *Teaching certificate course for postgraduate students* 10 Weeks course organized  
22 Nov 2023 by Center for Teaching and Learning (CTL), Khalifa University, Abu Dhabi, UAE.

### Modules covered:

- o Effective teaching strategies.
- o Educational technology tools.
- o Active learning strategies.
- o Metacognitive and reflective practices.
- o Intercultural communication.
- o Gender communication styles.
- o Micro-teaching.

## Research Interests

- o Resource allocation and non-convex optimization in 5G / beyond 5G.
- o Computational intelligence and optimization.
- o Evolutionary algorithms for constrained and unconstrained optimization problems.
- o Hardware security.

## Patents & Intellectual Property

**Title:** Dropped-packets repair and recovery for delay-tolerant wireless systems using retroactive interference cancellation

**Number:** *US Patent US12381829B2*

**Inventors:** A. Aldweik, Y. Iraqi, A. Ahmed

**Grant date:** Aug. 5, 2025, **Filing date:** May 4, 2023.

**Assignee:** Khalifa University of Science, Technology and Research (KUSTAR).

## Publications

[Google Scholar](#) [Scopus](#) [ORCID](#)

	Journals (A)				Conferences (B)	
	Published					Under Review
	Q1	Q2	Q3	None	2	17
	30	8	1	1		
Total	40					
Total publications	$A + B = 40 + 17 = 57$					

### Journals

1. A. Akbar, S. Jangsher, A. Ahmed, and A. Zafar, "GA-Optimized JT-CoMP F-NOMA in Het-nets: Adaptive Resource Allocation with Imperfect SIC", in *Elsevier Physical Communications* (Accepted) (Impact factor: 2.0, Q2 (SJR))
2. A. Ahmed, A. Al-Dweik, Y. Iraqi, H. Yahya and E. Damiani, "Intelligent NOMA-Based Wireless Backhauling for IoT Applications Without End-Device CSI," in *IEEE Open Journal of the Communications Society*, vol. 6, pp. 1070-1090, 2025 (Impact factor: 7.9, Q1 (SJR))
3. A. Ahmed, R. Alkadi, K. Belwafi, M. Atrouz and A. Shoufan, "Real-Time Mobile Crowd Sensing Model for Remote Detection of Flying UAVs," in *IEEE Open Journal of the Communications Society*, vol. 6, pp. 1103-1128, 2025 (Impact factor: 7.9, Q1 (SJR))
4. K. Belwafi, A. Shoufan, M. Alsafi, A. Ahmed and K. Han, "Hardware/Software Implementation of a Chip-to-Chip Communication Protocol Based on SPDM," in *IEEE Access*, vol. 12, pp. 194962-194972, 2024 (Impact factor: 3.4, Q1 (SJR))
5. A. Akbar, A. Ahmed, A. Zafar, and S. Jangsher, "An Energy-Efficient JT-CoMP enabled Framework with Adaptive OMA/NOMA in HetNets", in *Elsevier Computer Networks*, Vol. 254, pp. 110733, Dec. 2024 (Impact factor: 4.4, Q1 (SJR))
6. A. Ahmed, A. Al-Dweik, Y. Iraqi and E. Damiani, "Integrated Terrestrial-Wired and LEO Satellite With Offline Bidirectional Cooperation for 6G IoT Networks," in *IEEE Internet of Things Journal*, vol. 11, no. 9, pp. 15767-15782, May. 2024 (Impact factor: 10.6, Q1 (SJR))
7. M. Ahsan, A. Ahmed, H. Fida, A. Al-Dweik, U. S. Hashmi and A. Ahmad, "Efficient Network Slicing for 5G Services in Cloud Fog-RAN Deployment Over WDM Network," in *IEEE Transactions on Vehicular Technology*, vol. 72, no. 9, pp. 12099-12112, Sept. 2023 (Impact factor: 6.8, Q1 (SJR))
8. H. Yahya, A. Ahmed, E. Alsusa, and A. Al-Dweik, "Error Rate Analysis of NOMA: Principles, Survey and Future Directions", in *IEEE Open Journal of the Communications Society*, vol. 4, pp. 1682-1727, 2023 (Impact factor: 7.9, Q1 (SJR))
9. A. Ahmed, A. Shoufan and K. Belwafi, "Light-Weight Security Protocol and Data Model for Chip-to-Chip Zero-Trust," in *IEEE Access*, vol. 11, pp. 60335-60348, 2023 (Impact factor: 3.9, Q1 (SJR))
10. A. Ahmad, A. Ahmed, A. Al-Dweik, S. T. Ali, and A. Ahmad, "Merging Engine Implementation for Intra-Frame Sharing in Multi-Tenant Virtual Passive Optical Networks", in *IEEE/OSA Journal of Optical Communications and Networking*, Vol. 15, Issue 4, pp. 209-218, Mar 2023 (Impact factor: 5, Q1 (SJR))

11. M. Ahsan, A. Ahmed, A. Al-Dweik and A. Ahmad, "Functional Split-Aware Optimal BBU Placement for 5G Cloud-RAN Over WDM Access/Aggregation Network", in *IEEE Systems Journal*, vol. 17, no. 1, pp. 122-133, March 2023 (Impact factor: 4.4, Q1 (SJRR))
12. B. S. Khan, S. Jangsher, A. Ahmed and A. Al-Dweik, "URLLC and eMBB in 5G Industrial IoT: A Survey", in *IEEE Open Journal of the Communications Society*, vol. 3, pp. 1134-1163, 2022 (Impact factor: 7.9, Q1 (SJRR))
13. F. Kalbat, A. Al-Dweik and A. Ahmed, "On the Performance of Precoded OFDM Systems in the Presence of Symbol Timing Offset", in *IEEE Transactions on Vehicular Technology*, vol. 71, no. 9, pp. 10120-10125, Sept. 2022 (Impact factor: 6.8, Q1 (SJRR))
14. M. Awais, M. Paara, and A. Ahmed, "Energy Efficient Design of Fast Fourier Transform using Reversible Logic", in *Elsevier Sustainable Energy Technologies & Assessments*, vol. 52, part C, pp. 102257, Aug 2022 (Impact factor: 8.4, Q1 (SJRR))
15. A. Mahmood, A. Ahmed, M. Naeem, M. R. Amirzada and A. Al-Dweik, "Weighted Utility Aware Computational Overhead Minimization of Wireless Power Mobile Edge Cloud", in *Elsevier Computer Communications*, vol. 190, pp. 178-189, Jun 2022 (Impact factor: 6, Q1 (SJRR))
16. H. Yahya, A. Al-Dweik, Y. Iraqi, E. Alsusa and A. Ahmed, "A Power and Spectrum Efficient Uplink Transmission Scheme for QoS-Constrained IoT Networks", in *IEEE Internet of Things Journal*, vol. 9, no. 18, pp. 17425-17439, Sept.15, 2022 (Impact factor: 10.8, Q1 (SJRR))
17. A. Ahmed, A. Al-Dweik, Y. Iraqi, H. Mukhtar, M. Naeem and E. Hossain, "Hybrid Automatic Repeat Request (HARQ) in Wireless Communications Systems and Standards: A Contemporary Survey", in *IEEE Communications Surveys & Tutorials*, vol. 23, no. 4, pp. 2711-2752, Fourthquarter 2021 (Impact factor: 35.6, Q1 (SJRR))
18. W. Walid, M. Awais, A. Ahmed, G. Masera, M. Martina, "Real-Time Implementation of Fast Discriminative Scale Space Tracking Algorithm", in *Journal of Real-time Image Processing*, May 2021 (Impact factor: 3, Q2 (SJRR))
19. A. Ahmed, M. Naeem, and A. Al-Dweik, "Joint Optimization of Sensors Association and UAVs Placement in IoT Applications with Practical Network Constraints", in *IEEE Access*, vol. 9, pp. 7674 – 7689, Jan. 2021 (Impact factor: 3.9, Q1 (SJRR))
20. I. Jadoon, M. A. Z. Raja, M. Junaid, A. Ahmed, A. U. Rehman, and M. Shoaib, "Design of evolutionarily optimized finite-difference based numerical computing for dust density model of nonlinear Van-der Pol Mathieu's oscillatory systems", in *Mathematics and Computers in Simulation*, vol. 181, pp. 444-470, Mar. 2021 (Impact factor: 4.6, Q2 (SJRR))
21. I. Jadoon, A. Ahmed, A. U. Rehman, M. Shoaib, and M. A. Z. Raja, "Integrated meta-heuristics finite difference method for the dynamics of nonlinear unipolar electrohydrodynamic pump flow model", in *Applied Soft Computing*, vol. 97, part A, pp. 106791, Dec. 2020 (Impact factor: 8.7, Q1 (SJRR))
22. T. Akram, M. Awais, R. Naqvi, A. Ahmed and M. Naeem, "Multicriteria UAV Base Stations Placement for Disaster Management", in *IEEE Systems Journal*, vol. 14, no. 3, pp. 3475-3482, Sept. 2020 (Impact factor: 4.4, Q1 (SJRR))

23. A. Mahmood, A. Ahmed, M. Naeem and Y. Hong, "Partial Offloading in Energy Harvested Mobile Edge Computing: A Direct Search Approach", in *IEEE Access*, vol. 8, pp. 36757-36763, 2020 (Impact factor: 3.9, Q1 (SJRI))
24. M. Ahmad, M. Ali, M. Naeem, A. Ahmed, M. Iqbal, W. Ejaz and A. Anpalagan, "Device-Centric Communication in IoT: An Energy Efficiency Perspective", in *Transactions on Emerging Telecommunications Technologies*, 31(2), e3750, 2020 (Impact factor: 3.6, Q2 (SJRI))
25. M. Ahmad, F. Alam, A. Ahmed, M. Naeem, M. Iqbal and T. Umer, "Energy Efficiency in Cognitive Radio Assisted D2D Communication Networks", in *Springer Telecommunication Systems*, vol. 71, issue 2, pp. 167-180, June 2019 (Impact factor: 2.5, Q2 (SJRI))
26. A. Ahmed, M. Ali, M. Naeem, M. Iqbal, U. Pareek, and A. A. Khan, "A Non-Orthogonal Cooperative Scheme for Multi-user CRN using Probabilistic Interference Constraint", in *Transactions on Emerging Telecommunications Technologies*, vol. 30(5), pages e3568, 2019 (Impact factor: 3.6, Q2 (SJRI))
27. M. Awais, A. Razzaq, A. Ahmed and G. Masera, "LDPC check node implementation using reversible logic", in *IET Circuits, Devices & Systems*, vol. 13, no. 4, pp. 443-455, 7 2019 (Impact factor: 1.3, Q3 (SJRI))
28. A. Ahmed, M. Awais, T. Akram, S. Kulac, M. Alhussein, and K. Aurangzeb, "Joint placement and device association of UAV base stations in IoT Networks", in *Sensors*, vol. 19(9), pages 2157, May 2019. (Impact factor: 3.9, Q1 (SJRI))
29. M. Awais, A. Ahmed, S. A. Ali, M. Naeem, W. Ejaz and A. Anpalagan, "Resource Management in Multicloud IoT Radio Access Network", in *IEEE Internet of Things Journal*, vol. 6, no. 2, pp. 3014-3023, April 2019 (Impact factor: 10.8, Q1 (SJRI))
30. M. Amjad, A. Ahmed, M. Naeem, M. Awais, W. Ejaz, and A. Anpalagan, "Resource Management in Energy Harvesting Cooperative IoT Network under QoS Constraints", in *Sensors* 2018, 18, 3560. (Impact factor: 3.9, Q1 (SJRI))
31. A. Ahmed, M. Awais, M. Iqbal, M. Naeem, and A. Anpalagan, "An insight to the performance of estimation of distribution algorithm for multiple line outage identification", in *Elsevier Swarm and Evolutionary Computation*, Volume 39, Pages 114-122, 2018 (Impact factor: 10, Q1 (SJRI))
32. A. Ahmed, M. Awais, M. Naeem, M. Iqbal, W. Ejaz, A. Anpalagan, and H. Kim, "Multiple Power Line Outage Detection in Smart Grids: A Probabilistic Bayesian Approach", in *IEEE Access*, Vol. 6, Issue 1, Pages 10650-10661, 2018. (Impact factor: 3.9, Q1 (SJRI))
33. M. Iqbal, M. Naeem, A. Ahmed, M. Awais, A. Anpalagan, and A. Ahmed "Swarm Intelligence Based Resource Management for Cooperative Cognitive Radio Network in Smart Hospitals", in *Wireless Personal Communications*, Volume 98, Issue 1, Jan 2018, pp 571-592 (Impact factor: 2.2, Q2 (SJRI))
34. M. R. Ramzan, N. Nawaz, A. Ahmed, M. Naeem, M. Iqbal, and A. Anpalagan, "Multi-objective optimization for spectrum sharing in cognitive radio networks: A review", in *Pervasive and Mobile Computing*, Volume 41, 2017, Pages 106-131 (Impact factor: 4.3, Q1 (SJRI))

35. M. Awais, A. Ahmed, M. Naeem, M. Iqbal, W. Ijaz, and A. Anpalagan, "Efficient Joint User Association and Resource Allocation for Cloud Radio Access Networks", in *IEEE Access*, vol. 5, no. , pp. 1439-1448, 2017. (Impact factor: 3.9, Q1 (SJR))
36. M. Ahmad, M. Naeem, A. Ahmed, M. Iqbal, and A. Anpalagan, "Mesh Adaptive Direct Search Approach for D2D Resource Management", in *Wireless Communications and Mobile Computing*, Volume 16, Issue 15, Pages 2329–2339, October 2016 (Impact factor: 2.146, Q2 (SJR))
37. M. Awais, A. Ahmed, M. Naeem, M. Iqbal, N. Qadri, and A. Anpalagan, "Multiple line outages identification: A customized quantum inspired approach", in *Electric Power Systems Research*, Volume 134, May 2016, Pages 47-55 (Impact factor: 3.9, Q1 (SJR))
38. M. Iqbal, M. Naeem, A. Anpalagan, A. Ahmed, and M. Azam, "Wireless Sensor Network Optimization: Multi-Objective Paradigm", in *Sensors* 2015, 15, 17572-17620. (Impact factor: 3.9, Q1 (SJR))
39. M. U. Shahid, A. Ahmed, M. Martina, G. Masera, and E. Magli, "Parallel H.264/AVC Fast Rate-Distortion Optimized Motion Estimation by Using a Graphics Processing Unit and Dedicated Hardware", in *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 25, no. 4, pp.701,715, April 2015 (Impact factor: 8.4, Q1 (SJR))
40. A. Ahmed, A. U. Rehman, M. U. Shahid, "N-Point DCT Architecture for H265/HEVC", in *Hindawi VLSI Design Special Issue on VLSI Circuits, Systems, and Architectures for Advanced Image and Video Compression Standards*, 2012. <https://www.hindawi.com/journals/vlsi/2012/752024/>

#### Preprints

1. Akbar, Aamina and Jangsher, Sobia and Ahmed, Ashfaq and Zafar, Adnan, "GA-Optimized JT-CoMP F-NOMA in Hetnets: Adaptive Resource Allocation with Imperfect SIC". Available at SSRN: <https://ssrn.com/abstract=5023137>
2. A. Ahmed, A. Al-Dweik, Y. Iraqi, H. Yahya, and E. Damiani, "Intelligent NOMA-Based Wireless Backhauling for IoT Applications without End-Device CSI", in *TechRxiv*. February 13, 2024. doi: 10.36227/techrxiv.170779832.29157587/v1
3. Ahmed, Ashfaq and Alkadi, Ruba and Belwafi, Kais and Shoufan, Abdulhadi, Real-Time Mobile Crowd Sensing Model for Remote Detection of Flying UAVs. Available at SSRN: <https://ssrn.com/abstract=4909953>
4. Akbar, Aamina and Ahmed, Ashfaq and Zafar, Adnan and Jangsher, Sobia, An Energy-Efficient JT-Comp Enabled Framework with Adaptive OMA/NOMA in Hetnets. Available at SSRN: <https://ssrn.com/abstract=4820783>

#### Conference Proceedings

1. A. Ahmed, and A. Shoufan "Monitoring of UAVs Through Remote Identification and Mobile Crowd Sensing", in *The 3rd International Workshop on Mobile Crowdsensing for Smart Cities (CrowdSenCity)*, in *The 26th IEEE International Conference on Mobile Data Management (MDM)*, Irvina, USA (Accepted)
2. A. Alhashmi, K. Belwafi, A. Ahmed, and A. Shoufan, "Secure Authentication for Remote Drone Identification Using ASTM Standards," *IEEE Wireless Communications & Mobile Computing Conference (IWCMC)*, Abu Dhabi, UAE (Accepted)

3. M. Ahsan, A. Ahmed, S. Ekin, J. O'Hara and A. Ahmad, "Traffic-Aware Network Slicing for 5G Networks in Cloud Fog-RAN over WDM Architecture," *International Conference on Smart Applications, Communications and Networking (SmartNets)*, Harrisonburg, VA, USA, 2024, pp. 1-6
4. K. Belwafi, H. Alshamsi, A. Ahmed and A. Shoufan, "Enhancing Circuit Authentication through Secure Isolation," *IEEE International Symposium on Circuits and Systems (ISCAS)*, Singapore, Singapore, 2024, pp. 1-5.
5. A. Ahmed, M. Naeem, A. Ahmad and S. Ahmed, "Joint Trajectory, Power Profile and Harvested Energy Management in Cooperative UAVs," in *Tenth International Conference on Social Networks Analysis, Management and Security (SNAMS)*, Abu Dhabi, United Arab Emirates, 2023, pp. 1-8, doi: 10.1109/SNAMS60348.2023.10375447.
6. K. Belwafi, H. Alshamsi, A. Ahmed and A. Shoufan, "Zero-Trust Communication between Chips," in *IFIP/IEEE 31st International Conference on Very Large Scale Integration (VLSI-SoC)*, Dubai, United Arab Emirates, 2023, pp. 1-5, doi: 10.1109/VLSI-SoC57769.2023.10321927
7. S. Tariq, U. Saleem, S. Jangsher, A. Ahmed, and A. AlDweik, "Joint Power Allocation and Power Splitting Ratio for SWIPT-Enabled UAV Assisted Time-Shared Cooperative NOMA", in *International Conference on Innovation and Technological Advances for Sustainability (ITAS 2023)*, Doha, Qatar [Best Paper Award]
8. M. F. Khan, M. Azam, A. Ahmed, A. A. Khan, M. Naeem, and I. Alam, "Joint User Selection and Base Station Assignment Strategy in Smart Grid", in *International Conference on Advanced Engineering, Technology and Applications (ICAETA)*, 2021
9. S. Zeb, A. Ahmad, A. Ahmed, and A. Bianco, "Power Aware Data Center Placement in WDM Optical Networks", in *IEEE Consumer Communications and Networking Conference (CCNC)*, 2021
10. M. Ali, M. Ahmad, M. Naeem, A. Ahmed, M. Iqbal, W. Ejaz, and A. Anpalagan, "Devices to Devices (Ds2Ds) Communication: Towards Energy Efficient IoT", in *IEEE Global Communications Conference (GLOBECOM)*, Abu Dhabi, United Arab Emirates, 2018, pp. 1-6
11. M. Ahmad, M. Naeem, A. Ahmed, M. Iqbal, and A. Alpalagan, "Utility based Resource Management in D2D Networks using Mesh Adaptive Direct Search Method", in *Vehicular Technologies Conference (VTC)*, vol., no., pp no., 19-21 September 2016
12. A. Ahmed, M. Awais, M. Naeem, M. Iqbal, and A. Alpalagan, "Efficient multiple lines outage detection in SmartGrid", in *Power Generation System and Renewable Energy Technologies (PGSRET)*, vol., no., pp.1-6, 10-11 June 2015
13. M. U. Shahid, A. Ahmed, and E. Magli, "Parallel rate-distortion optimized fast motion estimation algorithm for H.264/AVC using GPU", in *Picture Coding Symposium (PCS)*, pp.221,224, 8-11 Dec. 2013
14. A. Ahmed, M. U. Shahid, M. Martina, E. Magli, and G. Masera, Guido, "VLSI Architecture for Low-Complexity Motion Estimation in H.264 Multiview Video Coding", in *Euromicro Conference on Digital System Design (DSD)* , vol., no., pp.288,292, 4-6 Sept. 2013



15. A. Ahmed, M. Martina, and G. Masera, "Turbo decoder VLSI architecture with non-recursive max\* operator for 3GPP LTE standard", in *The Fifth International Conference on Advances in Satellite and Space Communications (SPACOMM)*, April 21, 2013 to April 26, 2013 . pp. 40-45
16. A. Ahmed, M. Awais, A. U. Rehman, M. Maurizio, and G. Masera, "A High Throughput Turbo Decoder VLSI Architecture for 3GPP LTE Standard", in *14th IEEE INMIC Conference (INMIC)*, Dec 22 – 24, 2011, Karachi, Pakistan
17. A. Ahmed, M. Awais, M. Maurizio, and G. Masera, "VLSI Implementation of 16-point DCT for H.265/HEVC using Walsh Hadamard Transform and Lifting Scheme", in *14th IEEE INMIC Conference (INMIC)*, Dec 22 – 24, 2011, Karachi, Pakistan

## Research Funding

- 2017-2018 **National Research Program for Universities (NRPU), Higher Education Commission of Pakistan (HEC)**, *A system for health monitoring of railway*, Principal Investigator (PI) from COMSATS University Islamabad, Wah Campus, Pakistan,.
- 2015-2016 **Higher Education Commission of Pakistan (HEC) Startup Grant**, *Design and implementation of advanced LDPC decoder for next generation communications targeting Giga bits per second (Gbps) throughput* , Co-Principal Investigator (Co-PI) from COMSATS University Islamabad, Wah Campus, Pakistan,.
- 2014-2015 **Higher Education Commission of Pakistan (HEC) Startup Grant**, *Efficient Hardware Implementation of Interpolation Filter for HEVC Standard, Targeting Low Power Mobile Devices*, Principal Investigator (PI) from COMSATS University Islamabad, Wah Campus, Pakistan,.
- Oct. 2024-Dec. 2027 **Khalifa University (KU) Research & Innovation Grant (RIG) 2024**, *A System for Wide-Area Monitoring and Surveillance of Unmanned Aerial Vehicles in Urban Airspace*, Principal Investigator (PI) from KU.  
I drafted the entire research proposal and was selected for a full-time research postdoc position.
- 2025-2029 **Saudi Basic Science Initiative, Research Consortium Grants (RCG)**, *Remote Identification based UAV Monitoring System*, Principal Investigator (PI) from King Saud University, Secondary PI from Khalifa University and University of Sharjah.  
I drafted most of the research proposal and will be the part of project team as a research postdoc position.

## Supervision

### PhD

- o E. Jadoon, *Design of Meta-Heuristic Computing Paradigm for the Analysis of Nonlinear Electrohydrodynamic Models*, Completed (Co-Supervised).
- o M. Amjad, *Resource Management in Energy Harvested Cooperative IoT Network*, Completed (Co-Supervised).

### MS

- o A. Iqbal, *Optimal PMU Placement in Smart Grid for Line Outage Detection*.
- o S. Iqbal, *Flexible Reference Model for LTE/UMTS Turbo Codes*.
- o N. Irshad, *A Hardware Accelerator for the Line Outage Detection*.

- o M. Y. Madni, *Shielding effectiveness of metallic cavity with slots on multiple sidewalls using FDTD*.
- o Q. Ahmad, *Multi-Tier Internet of Things (IoT) Nodes Deployment for Energy Efficiency*.
- o Salman, *Efficient Charging Stations Placement in Smart City*.
- o S. Mehmood, *Efficient PMU Placement for Complete System Observability in Power Grids*.
- o M. Amin, *Multi-Resource Power Generation Scheduling*.
- o M. Hussain, *Renewable Energy Assisted Stochastic Multi-Objective Long Term Hydrothermal Cooperation*.
- o M. A. Khan, *Efficient Method for PMU Placement: A Non-Linear Modeling Approach*.
- o B. Emanuel, *Optimal Power Generation in Islandic Micro Grid*.
- o J. Ali, *Budget Constrained Electric Charging Terminal Placement*.
- o A. Mahmood, *Energy Harvested Assisted Data Offloading in IoT Enabled Mobile Edge Cloud*.
- o K. Shahzad, *Tasks scheduling for Energy Efficiency using Mobile Edge Computing*.

#### BS

- o K. Rana, W. Ahmad, *Highly parallel GPU based motion tracking algorithm*.
- o A. Niaz, I. Elahi, *Environmental management in the broiler house, an optimized solution*.
- o M. Talha, W. Malik, *Railway monitoring system*.
- o A. Ahmad, M. Zeeshan, M. Uzair, M. Muneeb, *Hybrid car by use of solar panel and wind power*.
- o A. Mannan, M. A. Awan, M. Afzal, A. Saeed, *Design of smart switch*.
- o M. M. Safdar, M. Zeeshan, M. Uzair, A. Ahmad, *Solar powered electric car*.
- o A. Fraz, A. Hadi, U. Ahmed, S. Batool, *Smart card based prepaid energy meter and wireless home-load control*.
- o H. M. Naeem, A. Raza, G. Akbar, A. Munir, *Remote health monitoring and automated supervision of buildings*.
- o Omer, A. Ali, S. Imam, N. Anwar, *Test bed for electrical energy storage in electrical generation system*.

## Professional Accomplishments

### Memberships

- o IEEE Senior Member (Membership No. 92086166).
- o Registered Engineer, Pakistan Engineering Council (PEC) – COMP/7566.
- o Higher Education Commission (HEC) approved PhD Supervisor.

### Awards & Recognitions

- o Five-year fully funded HEC Scholarship for MS leading to PhD at Politecnico di Torino, Italy (2008–2013).
- o Research Award, COMSATS Institute of IT for academic years 2014–2015 and 2015–2016.
- o Honorarium for devoted performance: PKR 25,000 (2015–16) and PKR 30,000 (2016–17), COMSATS Institute of IT, Wah Campus.

- o Letter of Appreciation from HoD, Electrical Engineering Dept., July 2017 (PEC Committee Convener).
- o Supervised BS project “Railway Monitoring System” – 3rd Prize at Frontier of Information Technology (FIT) Conference 2016.
- o Supervised BS projects “Environmental Management in Broiler House” and “Smart Switch” – Semi-finalists in UNIDO Cleantech Competition.

#### Academic & Professional Activities

- o Board Member, Undergraduate Studies, Dept. of Electronics Engineering, UET Taxila.
- o Board Member, Postgraduate Studies, Dept. of Electronics Engineering, UET Taxila.
- o Research Committee Member, supervision of three PhD students, UET Taxila.
- o Faculty Exchange Program, Duzce University, Turkey (Feb–Mar 2017, Mevlana Program).

#### Administrative Activities

- o Convener, PEC documentation committee, ECE Dept. CUI Wah Pakistan.
- o Convener, industrial visit committee, Electrical & Computer Engineering (ECE) Dept., COMSATS University Islamabad, (CUI) Wah Campus, Pakistan.
- o Graduate class counselor, ECE Dept. CUI Wah Pakistan.
- o Member, internship placement committee, ECE Dept. CUI Wah Pakistan.
- o Member, graduate program committee, ECE Dept. CUI Wah Pakistan.
- o Member, internal performance audit committee (campus level), CUI Wah Pakistan.
- o Member/Secretary, clean and green Pakistan drive committee (campus level), CUI Wah Pakistan.
- o Member/Secretary, tree plantation committee (campus level) CUI Wah Pakistan.
- o Member, MS (Electrical Engineering) scheme of studies for Computer Engineering and Informatics revise committee, ECE Dept. CUI Wah Pakistan.
- o Focal person for PEC re-accreditation visit 19-20 March 2015, ECE Dept. CUI Wah Pakistan.
- o Member, PEC visit committee, ECE Dept. CUI Wah Pakistan.
- o Member, orientation committee, ECE Dept. CUI Wah Pakistan.
- o Member/Secretary, orientation committee, ECE Dept. CUI Wah Pakistan.
- o Focal person for the establishment of IEEE student chapter, campus level, founding counselor student branch CUI Wah Pakistan.
- o Member, career counseling/placement committee, campus level CUI Wah Pakistan.
- o Member, internship placement and alumni coordination committee, ECE Dept. CUI Wah Pakistan.
- o Member, PEC documentation committee, ECE Dept. CUI Wah Pakistan.
- o Member, lab assistant recruitment committee, ECE Dept. CUI Wah Pakistan.
- o Undergraduate class counselor, ECE Dept. CUI Wah Pakistan.

#### Professional Activities

Reviewership IEEE Transaction of VLSI (TVLSI), IEEE Internet of Things Journal, IEEE Communication Letters, Journal of Circuits, Systems and Computer, IEEE Sensors Journal, IEEE Access, Elsevier Applied Soft Computing, Vehicular Technology Conference, Frontier of Information Technology (FIT) conference.

## Research Methods & Tools

Programming C/C++, Python, Visual Studio, Eclipse IDE, NetBeans

Software MATLAB (Optimization Toolbox: GA, fmincon), Synopsys Design Vision, Mentor Graphics, Tools Xilinx Foundation Series, LaTeX, LyX, Visio

Hardware VHDL, Verilog HDL, FPGA implementation, ASIC design, 8051/89C51 microcontroller

Optimization Mathematical modeling, Evolutionary algorithms (GA, EDA, PSO, CEO, ACO), Heuristic & Modeling methods, Unconstrained optimization (death-penalty methods), ILP/MILP/NLP/MINLP using OptiToolbox ([http://www.i2c2.aut.ac.nz/Resources/Software/OptiToolbox\\_Original.html](http://www.i2c2.aut.ac.nz/Resources/Software/OptiToolbox_Original.html))

Emerging Machine/Deep Learning and Reinforcement Learning applications in wireless communications Interests (MATLAB/Python)

## Languages

Urdu Native Speaker

English Fluent in speaking, writing, and reading

Arabic Fluent in reading

## Participation

- o Participated in SSRC-2022 and SSRC-2024 Summits held by Technology Innovation Institute (TII), Abu Dhabi, UAE to exhibit our project, held in Abu Dhabi, UAE.
- o Participated in IROS-2024 to exhibit our project, held in Abu Dhabi, UAE.
- o Presented a poster at IEEE International Symposium on Circuits and Systems (ISCAS) 2024, held in Singapore.
- o Presented our published work in Tenth International Conference on Social Networks Analysis, Management and Security (SNAMS) 2023, held in Abu Dhabi, United Arab Emirates.
- o Held a workshop on High Efficiency Video Coding (HEVC) at COMSATS Institute of IT, Wah campus, Pakistan in April 2015.
- o Participated and presented paper on line outage detection in PGSRET 2015 conference, IIUI Pakistan.
- o Attended FIT (2014, 2015, 2016) conference, held in Islamabad, Pakistan.
- o Attended SpaComm 2013 conference at Venice, Italy.
- o Attended DSD 2013 conference at Santander, Spain.
- o Remained President Organization of Pakistani Students (OPS), consists of more than 400 students, at Politecnico di Torino, Italy for one year (2012).
- o Attended STDay 2011 (Streaming Day) held at Politecnico di Torino Italy. A paper on 16-point DCT for H.265/HEVC was accepted and presented..
- o Attended workshop on "FPGA based chip designing" at Bahria University Islamabad Pakistan in March 2008.

- o Participated in NESCON2007 (engineering problem solving) and SOFTEC2007 (micro-controller interfacing) held in FAST-NU, Islamabad, representing Bahria University Islamabad, Pakistan.
- o Participated in one-day seminar on 10 January 2019 about “Fundamentals & practices of Islamic banking”, jointly organized by Bank Islami Pakistan and Center of Islamic Finance, CUI.
- o Participated in two days conference on 16-17 August 2017 about “Capacity building workshop on Islamic finance” in collaboration with State Bank of Pakistan.
- o Participated in two days seminar on 10-11 August 2015 on “Advance level training on internal auditing of ISO 9001:2008” at CUI Attock campus, organized by Constech Pakistan.
- o Participated in two days seminar on 9 & 18 August 2016 on “Transition of latest version of QMS ISO 9001:2015” at CUI Wah campus, organized by Constech Pakistan.
- o Participated in two days seminar on 18-19 August 2014 on “ISO 9001:2008 internal auditor” at CUI Attock campus, organized by Constech Pakistan.
- o Attended PSYWC’15 on 4 October 2015 held at CUI Islamabad.

## References

References available upon request.