Muhammad Asif Khan
Research Scientist
Qatar Mobility Innovations Center (QMIC), Doha, Qatar
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Education

2014-2019 Ph.D. in Electrical Engineering, Qatar University, 2019
Thesis: "Framework for Content Distribution over Wireless LANs"
Supervisor: Prof. Ridha Hamila

2010-2013 M.Sc. Telecommunication Engineering, University of Engineering and Technology Taxila
Thesis: "MAC-Aware Dynamic Source Routing Protocol"
Supervisor: Prof. Adeel Akram

2005-2009 B.Sc. Telecommunication Engineering, University of Engineering and Technology Mardan

Research Interests

Deep learning optimization for computer visio
Distributed machine learning and federated learning
Mobile edge computing and edge intelligence in B5G/6G, and IoT

Research Experience

2024-Now **Research Scientist**, Qatar Mobility Innovations Center, Qatar.
Research Project: "Smart, Connected, and Autonomous Vehicle and Energy systems for efficient, safe, secure, and sustainable transportation in metropolitan cities."

2021-2024 **Postdoctoral Research Fellow**, Qatar Mobility Innovations Center, Qatar University.
Research Project 1: "Context recognition in crowd monitoring using crowdsourced data."
Research Project 2: "DroneCMS: Flying Infrastructure for Intelligent Crowd Management and Security for Mega Events"

2020-2021 **Postdoctoral Research Fellow**, College of Engineering, Qatar University.
Research Project: "Predictive QoE-Aware and ML for Secure Live Streaming Over the Edge".

2016-2017 **Research Assistant**, Qatar Mobility Innovations Center, Qatar.
Research Project: "D-COCODI: Scalable Multimedia Multicasting Mobile Solutions for Smartphone Users in Dense Environments".

2014-2015 **Graduate Assistant**, Qatar Transportation and Traffic Safety Center, Qatar University.
Research Project: "Traffic congestion mitigation on Doha Expressway"

Courses Taught

2023 STAT-819 Advance Machine Learning (3 Cr. Hrs)

Supervision and Mentorship

2023 Co-Advisor, of Mr. Samiullah, M.Phil thesis, Abdul Wali Khan University, Mardan, Pakistan
2023 Research Mentor, Qatar University Young Scientists Center (QUYSC), Doha, Qatar
2023 Summer Internship Supervisor, Qatar Mobility Innovations Center (QMIC), Doha, Qata
2019 Community Mentor, Deeplearning.ai on Cousera, Online

Grants and Awards

2022   Certification of Appreciation / Spot Award, Qatar Mobility Innovations Center
2021   Post Doctoral Research Award (PDRA), Qatar National Research Fund, USD. 200,000
2014   Graduate Assistant Award, Qatar University, USD. 40,000
2009   Best Undergraduate Final Year Project, University of Engineering and Technology Peshawar

Talks

2024   **Invited Talk**, "Intelligent Edge for 6G and Massive IoT Systems" at the IEEE ICNGN, Bangkok, Thailand.
2023   **Tutorial**, Mobile Edge Computing for Massive IoT (MIoT) Systems at IEEE ISNCC, Qatar
2023   **Interview**, Generative AI as an automatic assimilator, processor, and determiner of interactions with people - employees or end-users, in Facilitate Magazine (IWFM), UK.
2021   **Interview**, "Artificial Intelligence in FM", in Facilitate, IWFM magazine, Mar 2021 Issue 4/7
2020   **Invited Talk**, Machine Learning in Mobile Edge Computing - Recent Trends, Opportunities, and Challenges" in MLIS2020, October 25-28, 2020, UK
2020   **Magazine Article**, "ABC of AI" in Facilitate, the official IWFM magazine, October Issue
2020   **Interview**, "Career Ladder" in Facilities Management Journal (FMJ), July 2020 Issue

Publications

For an up-to-date list of publications, Visit Google Scholar:
https://scholar.google.com/citations?user=BgUrPm8AAAAJ&hl .

Journal Articles

1. **M. A. Khan**, H. Menouar and R. Hamila, Accelerating Learning with Fixed Time Budget, *Nature Scientific Reports*, 2024. [Submitted].

2. M. Ishtiaq, N. Saeed and **M. A. Khan**, Edge Computing in IoT: A 6G Perspective, *IT Professional*, 2024. [Accepted].

3. L. Hamad, **M. A. Khan** and A. Mohamed, Object Depth and Size Estimation using Stereo-vision and Integration with SLAM, *IEEE Sensors Letters*, 2024.[Accepted].

4. N. Faiz, A. K. Gardiwal, **M. A. Khan**, and S. Iftikhar, "Dynamic prediction of survival via Landmark method using the asthma prevention trial in young children" *Plos one.* 2023 Nov 30;18(11).

5. **M. A. Khan**, H. Menouar, and R. Hamila, Visual Crowd Analysis - Open Research Problems," in *AI Magazine*, 2023.

6. **M. A. Khan**, H. Menouar, and R. Hamila, "LCDnet: A Lightweight Crowd Density Estimation Model for Real-time Video Surveillance," in *Journal of Real-Time Image Processing.*, 20, 29, 2023.

7. **M. A. Khan**, H. Menouar, and R. Hamila, Revisiting Crowd Counting: State-of-the-art, Trends, and Future Perspectives. in *Image and Vision Computing.*, 129, 104597, 2022.

8. **M. A. Khan**, H. Menouar, A. Eldeeb, A. Abu-Dayya, and F. D. Salim, "On the Detection of Unauthorized Drones—Techniques and Future Perspectives: A Review," in *IEEE Sensors Journal*, vol. 22, no. 12, pp. 11439-11455, 15 June 15, 2022.

9. **M. A. Khan**, R. Hamila, A. Erbad, and M. Gabbouj, "Distributed Inference in Resource-Constrained IoT for Real-Time Video Surveillance," in *IEEE Systems Journal*, 2022

10. **M. A. Khan**, A. Erbad, R. Hamila and E. Baccour, "CODE: Computation Offloading in D2D-Edge System for Video Streaming" in *IEEE Systems journal.*

11. **M. A. Khan**, E. Baccour, Z. Chkirbene, A. Erbad, R. Hamila, H. Hamdi, and M. Gabbouj, "A Survey on Mobile Edge Computing for Video Streaming: Opportunities and Challenges," in IEEE Access, vol. 10, pp. 120514-120550, 2022.

12. **M. A. Khan**, R. Hamila, A. Gastli, S. Kiranyaz, and N. A. Al-Emadi, "ML-based Handover Prediction and AP Selection in Cognitive Wi-Fi Networks", *Journal of Network and Systems Management.* 2022 Oct;30(4):1-21

13. D. Unal, M. Hammoudeh, **M. A. Khan**, A. Abuarqoub, G. Epiphaniou, R. Hamila, "Integration of Federated Machine Learning and Blockchain for the Provision of Secure Big Data Analytics for Internet of Things", *Computers and Security*, Jul. 2021

14. **M. A. Khan**, R. Hamila, N. A. Al-Emadi, M. S. Kiranyaz, and M. Gabbouj, "Real-time Throughput Prediction for Cognitive Wi-Fi Networks", *J. Netw. Comput. Appl.*, vol. 150, pp. 245-258, Sep. 2020.

15. **M. A. Khan**, R. Hamila and M. O. Hasna, "Optimal Group Formation in Dense Wi-Fi Direct Networks for Content Distribution," in *IEEE Access*, vol. 7, pp. 161231-161245, 2019.

16. K. Shaaban, **M. A. Khan**, and R. Hamila, Effect of Distance between Ramp and Upstream Signal on Ramp Meter Operation", *Journal of Traffic and Transportation Management*, vol. 1, no. 2, pp. 43–49, 2020.

17. **M. A. Khan**, R. Hamila, M. S. Kiranyaz, and M. Gabbouj, "A Novel UAV-Aided Network Architecture Using Wi-Fi Direct", in *IEEE Access*, vol. 7, pp. 67305-67318, 2019.

18. K. Shaaban, **M. A. Khan**, R. Hamila and M. Ghanim, "A Strategy for Emergency Vehicle Preemption and Route Selection", *Arabian Journal for Science and Engineering* 83 (2019): 1-9.

19. **M. A. Khan**, W. Cherif, F. Filali and R. Hamila, "Wi-Fi direct research-Current status and future perspectives", *J. Netw. Comput. Appl.*, vol. 93, pp. 245-258, Sep. 2017.

20. K. Shaaban, **M. A. Khan**, and R. Hamila, "Literature Review of Advancements in Adaptive Ramp Metering", *Procedia Computer Science* 83 (2016): 203-211.

Conference Articles

1. **M. A. Khan**, K. Shaaban, H. Menouar, and R. Hamila, "Transmitting More Than Signals: How Visible Light Communication and Sensing Enables Safer and Smarter Mobility" [submitted].

2. **M. A. Khan**, H. Menouar, and R. Hamila, Crowd Counting in Harsh Weather using Image Denoising with Pix2Pix GANs, in Thirty-Eighth International Conference on Image and Vision Computing, 2024.

3. **M. A. Khan**, H. Menouar, and R. Hamila, Multimodal Crowd Counting with Pix2Pix GANs, in 19th International Conference on Computer Vision Theory and Applications (VISAPP 2024), Rome, Italy, 2024.

4. L. Hamad, **M. A. Khan**, H. Menouar, F. Filali, and A. Mohamed, Haris: an advanced autonomous mobile robot for smart parking assistance, in 2024 IEEE International Conference on Consumer Electronics (ICCE), Las Vegas, NV, USA, 2024, pp. 1-6.

5. **M. A. Khan**, H. Menouar, and R. Hamila, Curriculum for Crowd Counting - Is it Worthy?, " in 19th International Conference on Computer Vision Theory and Applications (VISAPP 2024), Rome, Italy, 2024.

6. I. Mrad, E. Baccour, R. Hamila, **M. A. Khan**, A. Erbad, M. Hamdi, "RL-CEALS: Reinforcement Learning for Collaborative Edge Assisted Live Streaming", in 28th IEEE Symposium Computers and Communications (ISCC) 9 -12 July, Tunis Tunisia.

7. **M. A. Khan**, R. Hamila, and H. Menouar, "CLIP: Train Faster with Less Data" , in 2023 IEEE International Conference on Big Data and Smart Computing (BigComp), Jeju, Korea, Republic of, 2023, pp. 34-39.

8. **M. A. Khan**, H. Menouar, and R. Hamila, "Crowd Density Estimation Using Imperfect Labels" , 2023 IEEE International Conference on Consumer Electronics (ICCE), Las Vegas, NV, USA, 2023, pp. 1-6.

9. **M. A. Khan**, H. Menouar, and R. Hamila, "DroneNet: Crowd Density Estimation using Self-ONNs for Drones" , 2023 IEEE 20th Consumer Communications and Networking Conference (CCNC), Las Vegas, NV, USA, 2023, pp. 455-460.

10. **M. A. Khan**, H. Menouar, O. M. Khalid and A. Abu-Dayya, "Unauthorized Drone Detection: Experiments and Prototypes," 2022 IEEE International Conference on Industrial Technology (ICIT), Shanghai, China, 2022, pp. 1-6.

11. **M. A. Khan**, H. Menouar, and R. Hamila, "Drones-aided Asset Maintenance in Hospitals, in 2nd International Conference on Computers and Automation (CompAuto 2022), August 18-22, 2022, Paris, France

12. K. Shaaban, **M. A. Khan**, I. Kim and R. Hamila, "Queue Discharge at Freeway On-Ramps Using Coordinated Operation of a Ramp Meter and an Upstream Traffic Signal", Procedia Computer Science, Volume 170, 2020, Pages 347-353, ISSN 1877-0509

13. K. Rahman, S. Mallick, **M. A. Khan**, "Travel Time Estimation using Multivariate Regression Model", In Qatar Foundation Annual Research Conference Proceedings Volume 2018 Issue 1 2018 Mar 21, Vol. 2016, No. 1, p. EEPD1051.

14. W. Cherif, **M. A. Khan**, F. Filali, S. Sharafeddine, Z. Dawy, "P2P Group Formation Enhancement for Opportunistic Networks with Wi-Fi Direct", Proc. IEEE Wireless Commun. Netw. Conf. (WCNC), pp. 1-6, Mar. 2017.

15. **M. A. Khan**, W. Cherif, F. Filali and R. Hamila, "Realization of Dual-Hop Networks in Wi-Fi Direct and Performance Evaluation", 2017 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData), Exeter, 2017, pp. 552-559.

16. **M. A. Khan**, W. Cherif, F. Filali, "Group Owner Election in Wi-Fi Direct", Proc. IEEE Annu. Ubiquitous Comput. Electron. Mobile Commun. Conf. (UEMCON), pp. 1-9, Oct. 2016.

17. **M. A. Khan**, R. Hamila and K. Shaaban., "Mitigation of Traffic Congestion Using Ramp Metering on Doha Expressway", In Qatar Foundation Annual Research Conference Proceedings Volume 2016 Issue 1 2016 Mar 21, Vol. 2016, No. 1, p. ICTSP2224.

18. M. Shah, **M. A. Khan**, T. Mahmood, K. Islam, and J. Akbar, "Generation of orthogonally polarized chaotic waveforms for secure optical communication" 2013 IEEE 9th International Conference on Emerging Technologies (ICET), Islamabad, 2013, pp. 1-5.

19. **M. A. Khan**, S. Zakiuddin and J. Ahmad, "Cross-layer optimization of dynamic source routing protocol using IEEE 802.11e based medium awareness", 2013 3rd IEEE International Conference on Computer, Control, and Communication (IC4), Karachi, 2013, pp. 1-6.

20. M. S. Khan, S. Bashir, **M. A. Khan**, and K. Asaf, "Design and integration of dual-band textile antenna with high impedance surface", 2013 IEEE 9th International Conference on Emerging Technologies (ICET), Islamabad, 2013, pp. 1-6.

21. **M. A. Khan** and S. Zakiuddin, "Research review of the development of novel routing algorithms for mobile Ad-hoc networks", Eighth International Conference on Digital Information Management (ICDIM 2013), 2013, pp. 61-66

Book Chapters

1. **M. A. Khan**, and M. A. Ahmadon, "Mobile Edge Computing for the Next Generation Massive Internet of Things" in Evolution of Information, Communication and Computing System, 2023

2. **M. A. Khan**, M. A. Ahmadon, N. A. A. Rauf, A. M. Zaid, A. K. Mahamad, S. Saon, N. S. A. M. Taujuddin, and A. Jamil, "Implementation and simulation of udp client server environment using contiki cooja simulator." 2023.

Editorial and Professional Services

Journal Editorial Committees

Associate Editor, IEEE Future Directions Newsletter
Editorial board member, Computer Systems Science and Engineering Journal
Guest Editor, Frontiers in Communications and Networks

Journal Reviewer

Nature: Scientific Reports
IEEE Transactions: TAI, TNNLS, TETC, SMC, TCE, TCSVT, TMTT, TDSC
IEEE Journals: COMST, IOT, ISJ, Sens, Access, OJ-COMS, OJ-VT,
IEEE Magazines: COMMAG, WCM, IOTMAG, COMSTD
IEEE Letters: WCL, NL,SENSL
IET Journals: Communication, ITS,
Elsevier: FGCC, ICTE, COMPELECENG
Springer: WPC
Wiley: AIMAG

Conference Committees Chair

Co-Chair Technical Committee at IEEE ICFTSS 2024, Kuala Lumpur, Malaysia.
Program Co-Chair at CompAuto 2024, Milan, Italy.
Program Co-Chair at CRET 2024, Milan, Italy.
Tutorial Chair at IEEE GEM 2023, Bridgetown, Barbados.
Session Chair at ITAS 2023, Doha, Qatar.
Program Co-Chair at CompAuto 2023, Paris, France
Workshop Co-Chair at 6GIoTT 2022, Fuzhou, China
Session Chair at IEEE ICCE, 2023 | Las Vegas, NV, USA
Session Chair at CompAuto 2022, Paris, France

Conference TPC Member

- IEEE ICC, 2021-2024
- IEEE VTC2023-Fall
- IEEE CCNC, 2021-2024
- ICCE Berlin 2023
- CVIPPR'24
- IEEE BigData 2020
- IEEE SusTech 2020-2024
- IEEE Sensors 2020
- IEEE ICASSP 2020
- IEEE WF-IoT 2018

Technical Committees

- IEEE TCCC - CompSoc's Technical Community on Computer Communications
- IEEE TCPAMI - CompSoc's Technical Community on Pattern Analysis and Machine Intelligence
- IEEE MDA-TC - CTSoc's Technical Committee on ML, DL and AI in CE
- Internet of Things Community
- IEEE Sensors Council

Training/Certifications

- Chartered Engineer, EC UK
- TensorFlow Specialization, Deeplearning.ai
- Deep Learning Specialization, Deeplearning.ai
- Machine Learning, Stanford University at Coursera

- Fundamentals of Accelerated Computing with CUDA Python, Nvidia
- Getting Started with AI and Jetson Nano, Nvidia
- Machine Learning School 2019 organized by BigML and QCRI, Doha, Qatar
- Supervising Doctoral Studies, Epigeum, Oxford University Press
- Certified Peer Reviewer, Elsevier
- Certified Peer Reviewer, Web of Science Academy
- Mentor Community and Training, Coursera
- IBM Maximo, Asset, Inventory, and Work Order Management
- Energy Efficiency and Building Automation Systems, Schneider Electric
- Juniper Networks Certified Internet Associate - JNCIA
- IPv6 Forum Certified Network Engineer, IPv6 Forum
- 4G Mobile and Future Internet, ITU Academy
- Mobile Broadband: LTE/LTE-Advanced, WiMAX and WLAN, ITU Academy
- Future Internet, ITU Academy
- Migration to IPv6, ITU Academy

Conferences Attended

- International Conference on Computer Vision Theory and Applications (VISAPP), Rome, Italy, 2024
- IEEE Image and Vision Computing Conference (IVCNZ), Palmerston North, New Zealand, 2023
- IEEE Consumer Communications and Networking Conference 2023, Las Vegas, USA
- IEEE 41st International Conference on Consumer Electronics, 2023, Las Vegas, USA
- IEEE International Conference on Big Data and Smart Computing, 2023, Jeju, South Korea
- IEEE 23rd IEEE International Conference on Industrial Technology, 2022, Shanghai, China
- International Conference on Computers and Automation, 2023, Paris, France
- International Conference on Innovation and Technological Advances for Sustainability,2023, Doha, Qatar.

References

- **Prof. Ridha Hamila**, Electrical Engineering, Qatar University, Doha, Qatar, Tel: (+974) 44032 4210, Email: hamila@qu.edu.qa
- **Ass. Prof. Aiman Erbad**, Computer Science & Engineering, Hamad Bin Khalifa University, Doha, Qatar, Tel: (+974) 4454 2431, Email: aerbad@hbku.edu.qa
- **Dr. Hamid Menouar**, Principal R&D and Innovation Lead at Qatar Mobility Innovation Center (QMIC), Doha, Qatar, Tel: (+974) 4459 2712, Email: hamidm@qmic.com
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