

# Muhammad Asif Khan

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<https://scholar.google.com/citations?user=BgUrPm8AAAAJ&hl=en>

## Biography

I am a Postdoctoral Research Fellow at Qatar Mobility Innovations Center (QMIC), Qatar University. I received a Ph.D. degree in Electrical Engineering from Qatar University (2020), an M.Sc. degree in Telecommunication Engineering from the University of Engineering and Technology Taxila, Pakistan (2013), and a B.Sc. degree in Telecommunication Engineering from the University of Engineering and Technology Peshawar, Pakistan (2009). I have published over 25 peer-reviewed articles in high-impact journals and international conferences. I serve on the review panel of high-impact journals such as Nature Scientific Reports, numerous IEEE transactions, and journals. I also served/serving as a TPC member of major IEEE conferences including IEEE ICC, IEEE CCNC, IEEE SusTech, IEEE BigData, IEEE Sensors, ICASSP, etc. I'm a Senior Member of the IEEE and a Member of IET.

## Research Interest

- Mobile edge computing and edge intelligence in B5G/6G
- Distributed machine learning
- Crowd context recognition using deep learning and computer vision

## Teaching and Mentoring

- Community Mentor at Coursera Neural Networks Specialization Course.
- Summer Internship to undergraduate students (Research Track) on "iVDS: An Intelligent Safety Violation Detection System".
- Supervising young researchers and interns at Qatar Mobility Innovations Center (QMIC).

## Education

<b>Ph.D. in Electrical Engineering</b> Qatar University, Doha, Qatar.	Sep'14-Dec'19
<b>M.Sc. in Telecommunication Engineering</b> University of Engineering and Technology Taxila, Pakistan.	Aug'10-Mar'13
<b>B.Sc. in Telecommunication Engineering</b> University of Engineering and Technology Peshawar, Pakistan.	Sep'05-Sep'09

## Research Experience

<b>Awarded Postdoctoral Fellow</b> Qatar Mobility Innovations Center (QMIC), Qatar University. <u>Research Project:</u> Context-Recognition in Crowd Monitoring using Crowdsourced Data, funded by Qatar National Research Fund under Post-Doctoral Research Award (PDRA). LPI: Dr. Hamid Menouar ( <a href="mailto:hamidm@qmic.com">hamidm@qmic.com</a> )	<b>Dec'21-Present</b> <b>Doha, Qatar.</b>
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Research Project: DroneCMS: Drone Crowd Management System, funded by Qatar National Research Fund under National Priority Research Program (NPRP).  
LPI: Dr. Hamid Menouar ([hamidm@qmic.com](mailto:hamidm@qmic.com))

#### Postdoctoral Fellow

Department of Electrical Engineering, Qatar University.

Jun'20-Oct'21

Doha, Qatar.

Research Project: Predictive QoE-Aware and ML for Secure Live Streaming Over the Edge, funded by Qatar University.

LPI: Prof. Ridha Hamila ([hamila@qu.edu.qa](mailto:hamila@qu.edu.qa))

#### Research Assistant

Qatar Mobility Innovations Center (QMIC), Qatar University.

Jan'16-Dec'16

Doha, Qatar.

Research Project: D-COCODI - Framework for Cooperative Multimedia Multicasting in Dense Environments, Project Link: <https://www.qmic.com/solutions/de-cocodi/>

LPI: Dr. Fethi Filali ([filali@qmic.com](mailto:filali@qmic.com))

#### Graduate Assistant

Qatar Transportation and Traffic Safety Center (QTTSC), Qatar University.

Aug'14-Jul'15

Doha, Qatar.

Research Project: Traffic Congestion Mitigation at Doha Expressway

Supervisor: Dr. Mohamed Kharbeche ([mkharbec@qu.edu.qa](mailto:mkharbec@qu.edu.qa))

## Scholarships and Awards

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- ❑ **Certification of Appreciation / Spot Award** for "Designing an efficient AI-based crowd counting system" by Qatar Mobility Innovations Center (QMIC), Qatar Science and Technology Park, Qatar (Dec 2022)
  - ❑ **Post Doctoral Research Award (PDRA)**, Qatar National Research Fund (QNRF), Doha, Qatar, USD. 200,000 (2 Years), Oct 2021
  - ❑ **Graduate Assistant Award**, Qatar University, USD. 40,000 (1 Year), Aug 2014
  - ❑ **Best Undergraduate Final Year Project**, University of Engineering and Technology Peshawar, Sep 2019

## Publications

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### Journal Papers

- [J16] M. A. Khan, H. Menouar, and R. Hamila, "Curriculum for Crowd Counting - Is it Worthy?," in IEEE Transactions on Artificial Intelligence [submitted].
- [J15] M. A. Khan, H. Menouar, and R. Hamila, "Visual Crowd Analysis - Open Research Problems," in AI Magazine [submitted].
- [J14] 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.
- [J13] I. Mrad, E. Baccour, M. A. Khan, A. Erbad, R. Hamila, M. Hamdi, M. Gabbouj, "RL-CEALS: Reinforcement Learning for Collaborative Edge Assisted Live Streaming," in Pervasive and Mobile Computing [submitted].
- [J12] M. A. Khan, H. Menouar, & R. Hamila, Revisiting Crowd Counting: State-of-the-art, Trends, and Future Perspectives. In Image and Vision Computing., 129, 104597, 2022
- [J11] 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.
- [J10] 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

- [J9] M. A. Khan, A. Erbad, R. Hamila and E. Baccour, "CODE: Computation Offloading in D2D-Edge System for Video Streaming" in IEEE Systems journal [Accepted]
- [J8] 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.
- [J7] 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
- [J6] 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 & Security, Jul. 2021
- [J5] 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.
- [J4] 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.
- [J3] 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.
- [J2] 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.
- [J1] 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.

### **Conference Papers**

- [C16] M. A. Khan, R. Hamila, and H. Menouar, "CLIP: Train Faster with Less Data 2023 IEEE International Conference on Big Data and Smart Computing (BigComp), Jeju, Korea, Republic of, 2023, pp. 34-39.
- [C15] 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.
- [C14] M. A. Khan, H. Menouar, and R. Hamila, "DroneNet: Crowd Density Estimation using Self-ONNs for Drones", 2023 IEEE 20th Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA, 2023, pp. 455-460.
- [C13] M. A. Khan, H. Menouar, A. Eldeeb, A. Abu-Dayya, and F. Salim, "Detecting Unauthorized Drones – Experiments and Prototypes" [accepted in 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022), 22 - 25 August 2022, Shanghai, China]
- [C12] M. A. Khan, H. Menouar, and R. Hamila, "Drones-aided Asset Maintenance in Hospitals", [accepted in 2nd International Conference on Computers and Automation (CompAuto 2022), August 18-22, 2022, Paris, France]
- [C11] 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
- [C10] 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.
- [C9] 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.
- [C8] 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.

- [C7] 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.
- [C6] K. Shaaban, M. A. Khan, and R. Hamila, "Literature Review of Advancements in Adaptive Ramp Metering", Procedia Computer Science 83 (2016): 203-211.
- [C5] 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.
- [C4] 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.
- [C3] 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.
- [C2] 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.
- [C1] 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

#### **Invited Talks / Interviews / Editorials**

- [E5] "Network Slicing in 5G Networks", at Qatar University, April 11, 2023
- [E4] "Machine Learning in Mobile Edge Computing - Recent Trends, Opportunities and Challenges" at The 2nd International Conference on Machine Learning and Intelligent Systems (MLIS2020), October 25-28, 2020.
- [E3] "ABC of AI" published in Facilitate, the official IWFM magazine, October 2020 Issue
- [E2] "Career Ladder" published in Facilities Management Journal, July 2020 Issue
- [E1] "Artificial Intelligence in FM", published in Facilitate, the official IWFM magazine, Mar 2021 Issue

## **Editorials and Technical Committees**

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#### **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
- IEEE Sensors Council
- Internet of Things Community

#### **Journal Editorial Committee / Reviewer**

- Topic Editor, Edge Intelligence in 6G, in Frontiers in Communication and Networks
- Review Editor, Frontiers in Communication and Networks

#### **Journal Reviewer**

- Nature Scientific Reports

- IEEE Communication Magazine
- IEEE Wireless Communication Magazine
- IEEE Communication Standards Magazine
- IEEE Transactions on Emerging Topics in Computing
- IEEE Transactions on Systems, Man, and Cybernetics
- IEEE Transactions on Consumer Electronics
- IEEE Communications Surveys and Tutorials
- IEEE Systems Journal
- IEEE Access
- IEEE Open Journal of the Communication Society
- IEEE China Communications
- IET Communications
- IET Intelligent Transportation System
- Wireless Personal Communication (Springer)
- BigData

#### **Technical Program Committee Member**

- Program Co-Chair at the 3rd International Conference on Computers and Automation, Paris, France
- Co-Chair at “Sensing, Communication, and Localization in 6G” workshop at 6GloTT 2022, Fuzhou, China
- Session Chair at “2nd International Conference on Computers and Automation, Paris, France
- Session Chair at “IEEE Consumer Communications and Networking Conference 2023, Las Vegas, USA
- TPC Member at IEEE International Conference on Communications (ICC 2021, 2022)
- TPC Member at IEEE Consumer Communications and Networking Conference (CNCC 2021, 2022, 2023)
- TPC Member at IEEE BigData 2020
- TPC Member at IEEE Conference on Technologies for Sustainability (SusTech 2020, 2021, 2022)
- TPC Member at IEEE Sensors 2020
- TPC Member at IEEE International Conference on Acoustics, Speech, and Signal Processing, 2020
- TPC Member at International Conference on Machine Learning and Intelligent Systems (MLIS 2020)
- TPC Member at International Workshop on Signal Processing and Machine Learning (WSPML 2020)
- TPC Member at International Conference on Computing Science, Communication and Security (COMS2)
- TPC Member at IEEE 4th World Forum on Internet of Things (WF-IoT 2018)
- TPC Member at ICTIS2020, CTISC2020, BDML2020.

#### **Supervision and Mentoring**

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- Samiullah, M.Phil, Abdul Wali Khan University, Mardan, Pakistan
  - Community Mentor in “Deep Learning Specialization” at Coursera
  - Summar Internship to undergraduate students at Qatar University

#### **Training/Certifications**

- 
- TensorFlow Specialization at Coursera
  - Deep Learning Specialization at Coursera
  - Machine Learning from Stanford University at Coursera
  - Machine Learning School 2019 organized by BigML and QCRI, Doha, Qatar
  - Supervising Doctoral Studies, Epigeum, Oxford University Press.
  - Certified Peer Reviewer, Elsevier
  - Peer Review Course, Publons
  - Mentor Community and Training, Coursera
  - IBM Maximo Training for Asset Management, Inventory Management, 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
- Digital Terrestrial Television Broadcasting, ITU Academy
- Migration to IPv6, ITU Academy

## Conferences Attended

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- 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

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