

# Mohammad Alja'afreh (Ph.D.)

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## Summary of Qualifications

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- **Experience:** (Academic) worked as an assistant professor, lecturer, and teaching assistant for 12 years at the Princess Sumaya University for Technology, University of Ottawa, University of Doha, (Industrial) A senior networks engineer at Quadra Systems Cooperation, GJU's Systems Information and Technology Centre, and DND, Government of Canada.
- **Languages:** can read, write, and speak English and Arabic natively, with passive knowledge of French.
- **Achievements:** Got all my degrees with honor high GPAs. Published my research work in highly reputable and prestigious international journals and conferences. Have Served as TPC and conference session chair. In addition, I have been granted many awards for academic and research excellence.
- **Professional Certificates:** EIT (PEO), CCNP, CCSP, CCNA-S, CCNA-Instructor, CCNA, CSSP, and ACMA.
- **Soft Skills:** Excellent communication skills, analytical and critical thinking, innovative advisory and teaching skills, technical problem-solving, and collegueship.

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## Educational Background

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- Doctor of Philosophy (**Ph.D.**) in Electrical and Computer Engineering, University of Ottawa, Canada, CGPA 10/10(A+), 2021.
- Masters of Applied Science (**M.A.Sc**) in Electrical and Computer Engineering, University of Ottawa, Canada, CGPA 9.8/10(A+), 2013.
- Bachelor's in computer engineering, Mutah University, GPA **Excellent** with 1<sup>st</sup> rank among 2007-2008 fellows (**summa cum laude**), 2008.

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## Academic Experience

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- **Assistant Professor**, Princess Sumaya University for Technology (Jan 2012 – **Present**) Amman, Jordan, IoT Program, Communication Engineering Dept.
- **Research Scientist**, Mohamed bin Zayed University of Artificial Intelligence, UAE, Dec 2022- Dec 2023.
- **Adjunct Professor**, School of Electrical Engineering and Computer Science, University of Ottawa, Canada, Sep 2021- May 2023.
- **Assistance Professor**, Data Science and Artificial Intelligence, University of Doha for Science and Technology, Qatar May 2022-Sep 2022.
- **Part-time lecturer**, School of Electrical Engineering and Computer Science, University of Ottawa, Canada, May 2018- May 2021.

## Industrial Experience

- R&D Associate, Cybersecurity, Department of National Defense, Royal Military College, Canada, Jan 2020- Jan 2022.
- Network Systems Engineer, Quadra Systems Corporations, Canada, April 2013- August 2016.
- Network Administrator, German Jordanian University, Jordan, July 2008- August 2011

## Courses Taught

Princess Sumaya University for Technology:

- Undergraduate Level: Introduction to IoT (272351), IoT Programming and Applications (27351), VR Development of Mobile Applications(23453), Object Oriented Programming(22242), Communication Networks(23553).
- Participated in the refinement of the IoT program academic study plan according to the ABET standard while meeting the standard of the Quality Assurance Committee in the Ministry of Higher Education and Scientific Research-Jordan.

University of Ottawa:

- Undergraduate Level: Digital Systems ITI110, CSI 4900 Honor Project, ITI1120: Introduction to Computing I, CSI 4130 Computer Graphics, CEG 2136: Computer Architecture I. In addition, I contributed to the refinement of ITI1100 and CEG2136 to meet the CEAB accreditation.
- Graduate Level: ELG5195 Digital Logic Design: Principles and Practices, ELG 5121: Multimedia Communication, ELG6999: Network Security and Forensics.

University of Doha for Science and Technology:

- Undergraduate Level: DAI401 Fundamentals of IoT, INF101 Computer Hardware.
- Prepared the Academic Program Review (APR), ABET, report for the Data Science and AI B.S major.

## Professional Certificates and Training

- Cisco Certifications: CCNP, CCSP, Cisco Firewall Security Specialist, Cisco IOS Security Specialist, Cisco IPS Specialist, Cisco ASA Specialist, Cisco VPN Security Specialist, CCNA-I, CCNA-S, CCNA.
- Certified SonicWALL Security Administrator (CSSP).
- Aruba Certified Mobility Associate (ACMA).
- Microsoft Certified Technology Specialist MCTS on Microsoft Exchange Server
- McAfee Secure Gateway Specialist
- Microsoft Certified Systems Engineer Training course
- Servers Virtualization (VMware, MS-Hyper-V) Training course
- Microsoft Azure and Amazon AWS

## Specialized Skills

- Proficient in modern and native programming languages such as Python, R, Perl, Java, and C++.
- Solid experience in Altera Quartus II programmable logic device design software and MATLAB.
- Solid experience in network simulators such as NS3, Riverbed Modeler, Packet tracer, and GNS3.
- Robust experience with Machine and Deep Learning and Data Science: IBM Modeler and Microsoft Azure.
- Ability to work on different platforms such as MS Servers, UNIX, and Linux.
- Professional in Microsoft Office Suits, Project, and Visio.
- Extensive experience in group projects and research papers
- Experience in leading projects and encouraging teamwork.
- Openness to learn.
- Persistent.

## Awards and Honors

- Ontario Graduate Scholarship (OGS), University of Ottawa, Fall 2018-Spring 2019.
- Ontario Graduate Scholarship (OGS), University of Ottawa, Winter 2016-Fall 2017.
- Excellence Scholarship, University of Ottawa, Winter 2016-Spring 2019.
- Admission Scholarship, University of Ottawa, Fall 2014- Winter 2016.
- Faculty of Engineering honour award for top undergraduate students (2004-2007).

## Membership of Professional Societies

- PEO Engineering Intern (EIT), License number: **100548716**, P.Eng holder.
- Former President of the Electrical Engineering Graduate Students' Association (EEGSA)
- Institute of Electrical and Electronics Engineers (IEEE), from 2011 to date.
- Jordanian Universities Internet Task Force (JUNET) from 2008 to 2011.
- Jordan Engineers Association (JEA), From July 2008 to 2011.

## List of Publications

### ***Refereed Journal Papers:***

- [1] Hikmat Adhami, **Mohammed Al Ja'afreh**, Mohamed Hoda, and Abdulmotaleb El Saddik, "Suitability of SDN and MEC to Facilitate Digital Twin Communication over LTE-A", special issue on Digital Communications and Networks, Elsevier 2023.
- [2] Aftab Hussain, Adnan Akhunzada, **Mohammed Alja'afreh**, and Abdulmotaleb El Saddik, "An Attention-based ResNet Architecture for Acute Hemorrhage Detection and Classification: Toward a Health 4.0 Digital Twin Study", *IEEE Access*, 2022.
- [3] **Ja'afreh, M. A.**, Adhami, H., Alchalabi, A. E., Hoda, M., & El Saddik, A. (2021). "Toward integrating software-defined networks with the Internet of Things: a review". *Cluster Computing*, 1-18. (**IF: 2.04**)
- [4] El Saddik, Abdulmotaleb, Fedwa Laamarti, and **Mohammad Alja'afreh**. "The Potential of Digital Twins." *IEEE Instrumentation & Measurement Magazine* 24.3 (2021): 36-41.
- [5] Alowaidi, **M.**, **Al-Ja'afreh**, M., Karime, A. and El Saddik, A. "A Fuzzy Markup Language-Based Approach for a Quality of Location Inference as An Environmental Health Awareness" *International Journal of Extreme Automation and Connectivity in Healthcare (IJEACH)*, 1(2), pp.1-21, (2019).
- [6] **Al ja'afreh. M**, A, Eid. M, El Saddik. A, Mahmoodi. T, Liu. Q, Liu. X, Steinbach. E , Strese. M, "Haptic Codecs for the Tactile Internet", Authors listed in alphabetical order, (*In Proceedings of the IEEE special issue on Tactile Internet*), 2018.

## ***Refereed Book Chapters and IEEE Standards:***

- [7] **Mohammad Alja'afreh**, Mohamad Hoda, and Abdulmotaleb El Saddik. "Prediction of Complications in Spine Surgery Using Machine Learning: A Study on NSQIP beyond Logistic Regression Model ". IET Book Medical Information Processing and Security: Techniques and applications, 2022.
- [8] Adhami, Hikmat, **Al Ja'afreh, Mohammad**, and A. El Saddik, Abdulmotaleb, "Ontology based framework for Tactile Internet Applications" *Smart Multimedia*, 2019 (pp. 81-86). Springer, Cham.
- [9] **Al Jaafreh M**, Alowaidi M, Al Osman H, El Saddik A. "Multimodal Systems, Experiences, and Communications: A Review Toward the Tactile Internet Vision". *Recent Trends in Computer Applications*, 2018 (pp. 191-220). Springer, Cham.

## ***Refereed Conference Papers:***

- [10] **Alja'afreh, M.**, Alouneh, S., Obaidat, M., Karime, A., & Elsaddik, A. (2023). Metaverse through blockchain and intelligent networking: A comprehensive survey. In 2023, the Fifth International Conference on Blockchain Computing and Applications (BCCA). Kuwait.
- [11] **Alja'afreh, M.**, Al Mallah, R., Karime, A., & El Saddik, A. (2023). Cybersecurity in the metaverse: Challenges and approaches. In International Conference on Intelligent Metaverse Technologies & Applications (iMETA). Estonia.
- [12] El Ahmar, W., Massoud, Y., Kolhatkar, D., AlGhamdi, H., **Alja'afreh, M.**, Hammoud, R., & Laganiere, R. (2023). Enhanced Thermal-RGB Fusion for Robust Object Detection. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 365-374).
- [13] **Alja'afreh, M.**, Karime, A., Alouneh, S., & El Saddik, A. (2022). A Detailed Analysis of Qualitative and Quantitative Factors in Realization of 6G Communication. In 2022 9th International Conference on Internet of Things: Systems, Management and Security (IOTSMS) (pp. 1-10). IEEE.
- [14] **Alja'afreh, M.**, Obaidat, M., & Alouneh, S. (2022). Incorporating MPLS for Better SoC Utilization and Traffic Engineering. In 2022 Seventh International Conference on Fog and Mobile Edge Computing (FMEC) (pp. 1-7). IEEE.
- [15] **Alja'afreh, M.**, Obaidat, M., Karime, A., & Alouneh, S. (2022). Optimizing System-on-Chip Performance Using AI and SDN: Approaches and Challenges. In 2022 Ninth International Conference on Software Defined Systems (SDS) (pp. 1-8). IEEE.
- [16] **Mohammad Aljaafreh**, Wassim Elhamr, Mohamad Hoda, and Ali Karime "A Review on Industrial Blockchain" in The Fourth International Conference on Blockchain Computing and Applications (Texas, USA), 2022.
- [17] Ranwa Al Mallah, Talal Halabi, **Mohammad Alja'afreh**, and Ali Karime, "Artificial Intelligence for Cybersecurity in IoT-enabled Avionics: Challenges and Solutions" in IEEE 8th World Forum on Internet of Things, (Yokohama, Japan), 2022.
- [18] **Mohammad Aljaafreh**, Somaya Al Maadeed, Jihad M. ALJA'AM3, and Abdulmotaleb El Saddik "Towards a Comprehensive Study of Fatigue Deducing Techniques for Evaluating the Quality of Experience of Haptic-Visual" in IEEE International Conference on Informatics Conference (Doha, Qatar), 2020.
- [19] H. Adhami, **M. Aljaafreh**, and A. El Saddik, " Ontology-based framework for Tactile Internet Applications" in 2019 International Conference on SMART MULTIMEDIA, (San-Diego USA), Dec. 2019.
- [20] H. Adhami, **M. Aljaafreh**, and A. El Saddik, "Can We Deploy Tactile Internet Applications over Wi-Fi, 3G and WiMAX: a Comparative Study based on Riverbed Modeler" in 2019 IEEE International Symposium on Haptic, Audio and Visual Environments and Games (HAVE) (HAVE 2019), (Kuala Lumpur, Malaysia), Oct. 2019.
- [21] **M. Aljaafreh**, H. Adhami, and A. El Saddik, "Experimental QoS Optimization for Haptic Communication Over The Tactile Internet," in 2018 IEEE International Symposium on Haptic, Audio and

- Visual Environments and Games (HAVE) (HAVE 2018), (Dalian, P.R. China), Sept. 2018.
- [22] Majed Abdullah Alowaidi, Ali Karime, **Mohammad Al Jaafreh**, Abdulmotaleb El Saddik, "Empirical Study of Noise and Air Quality Correlation Based on IoT Sensory Platform Approach" IEEE International Instrumentation and Measurement Technology Conference (I2MTC) 2018.
- [23] **M. A. Ja'afreh**, M. Aloqaily I. A. Ridhawi and N. Mostafa, "A hybrid-based 3D streaming framework for mobile devices over IoT environments," Third International Conference on Fog and Mobile Edge Computing (FMEC), Barcelona, Spain, pp. 211-216, 2018.
- [24] **Al Jaafreh, Mohammad**, Abdelwahab Hamam, and Abdulmotaleb El Saddik. "A Framework to Analyze Fatigue for Haptic-Based Tactile Internet Applications." 2017 IEEE International Symposium on Haptic, Audio and Visual Environments and Games (HAVE). IEEE, 2017.
- [25] **M.Aljaafreh**, H.Maamar, A. Boukerche "An Efficient Object Discovery and Selection Protocol in 3D Streaming- based Systems over Smart Mobile Devices", proceeding of the IEEE Wireless Communications and Networking Conference (WCNC) 2013.
- [26] M.Aljaafreh, H.Maamar, A. Boukerche "3D Streaming over Thin Mobile Devices: Challenges and Visions" Poster in NSERC-DIVA 2nd Workshop, 2012. [http://nsercdiva.com/seminars\\_uottawa.php](http://nsercdiva.com/seminars_uottawa.php)

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## References

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