Dr. AMJAD IQBAL

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RESEARCH INTERESTS

Wireless Communication; Resource Allocation Optimization; Machine Learning; Deep Learning; Deep Reinforcement Learning; Reconfigurable Intelligent Surfaces (RIS); Unmanned Aerial Vehicles (UAV's); Near-Field Communication (NFC).

Google Scholar: https://scholar.google.com/citations?user=qA6hNUUAAAAJ&hl=en

WORK EXPERIENCE

Postdoctoral Fellow: ***Mar 2023-Present***

Department of Systems and Computer Engineering, Carleton University, Canada

Research Area: Deep Reinforcement Learning based Resource Allocation Optimization for 5G and Beyond Networks.

Mentorship: Prof. Gabriel Wainer, Dr. Ala'a Al-Habashna

Graduate Research Assistant: ***Feb 2019–Jul 2022***

Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman (UTAR), Malaysia.

Research: Deep reinforcement learning for resource allocation in 5G communications.

Lecturer: ***Jan 2017-Dec 2017***

Department of Electrical Engineering, Peshawar College of Engineering (PCE) affiliated UET Peshawar, Pakistan.

Courses Taught: Data Communication; Communication system; Electronic Device and Circuits

Lecturer: ***Jan 2018-Jan 2019***

Department of Electrical Engineering, Government Technical College Kohat, Pakistan

Courses Taught: Data Communication; Electric Circuits I (DC); Electric Circuits II (AC); Power Electronics

Lab Conduct: Power Electronics, Electric Circuits I.

EDUCATION

Doctor of Philosophy (Ph.D.) in Engineering Feb 2019 – May 2022, *Universiti Tunku Abdul Rahman (UTAR)*, Selangor Campus, Malaysia.

Thesis Title: Development of Deep Reinforcement Learning Based Resource Allocation Techniques in Cloud Radio Access Network.

Thesis Supervisors: Prof. Mau-Luen Tham, Prof. Chang Yoong Choon

Master of Science in Electrical Engineering Oct 2014 - Mar 2017, *University of Engineering and Technology (UET)*, Peshawar, Pakistan (**CGPA: 3.56/4.00**)

Thesis Title: Investigating Universal Filtered Multi-Carrier (UFMC) Performance Analysis in 5G Cognitive Radio-Based Sensor Networks (CSNs)

Thesis Supervisor: Prof. Syed Waqar Shah

Bachelor of Science in Electrical Engineering Sep 2010 - Jul 2014, *CECOS University of Information Technology and Emerging Sciences*, Peshawar, Pakistan (**CGPA: 3.32/4.00**)
Thesis Title: Auto Rail Gate Cross System using InfraRed Sensor
Thesis Supervisor: Prof. Ibrar Ullah

PUBLICATIONS

Journal

1. **A. Iqbal**, A. Al-Habashna, G. Wainer and G. Boudreau "Sum Rate Maximization in RIS-assisted Multi-user MISO Systems: A Proximal Policy Optimization-Based Approach," *Physical Communication (2025),* **IF=2.2.**
2. **A. Iqbal**, A. Al-Habashna, G. Wainer and G. Boudreau "Twin Delayed Deep Deterministic Policy Gradient-based Physical Layer Security and SEE in RIS-aided UAV Communication," *Computer Networks (2025),* **IF=4.6,** https://doi.org/10.1016/j.comnet.2025.111867
3. M. A. A. Khan, S. Luo, H. Ma, and **A. Iqbal**, "LoRa Meets Artificial Intelligence to Optimize Indoor Networks for Static EDs," *Trans. Emerg. Telecommun. Technol.*, vol. 36, no. 2, pp. 1–17, 2025, **IF=2.5,** https://doi.org/10.1002/ett.70060.
4. Y. J. Wong, M.-L. Tham, B.H. Kwan, and **A. Iqbal**, "Addressing Environmental Stochasticity in Reconfigurable Intelligent Surface aided Unmanned Aerial Vehicle Networks: Multi-Task Deep Reinforcement Learning based Optimization for Physical Layer Security," *Internet of Things*, **IF=6.0**, https://doi.org/10.1016/j.iot.2024.101270.
5. M. Sheraz, T. C. Chuah, M. Bin Roslee, M. Ahmed, **A. Iqbal**, and A.A.Habashna "Optimized Two-Tier Caching with Hybrid Millimeter-Wave and Microwave Communications for 6G Networks," *Appl. Sci.* **2024**, *14*(6), 2589, **IF=2.7,** https://doi.org/10.3390/app14062589.
6. **A. Iqbal**, M.-L. Tham, Y. J. Wong, A.-H. ALA'A, G. Wainer, Y. X. Zhu and T.Dagiuklas, **"**Empowering Non-Terrestrial Networks with Artificial Intelligence: A Survey, IEEE Access, **IF= 3.476**, vol. 11, pp. 100986 - 101006, Sep 2023, 10.1109/ACCESS.2023.3314732**.**
7. **A. Iqbal**, M. -L. Tham and Y. C. Chang, "Convolutional Neural Network-Based Deep Q-Network (CNN-DQN) Resource Management in Cloud Radio Access Network," *in China Communications,* Feb. 2022, **IF=3.17**, https://doi.org/10.23919/JCC.2022.00.025.
8. **A. Iqbal**, M. -L. Tham and Y. C. Chang, "Resource Allocation for Joint Energy and Spectral Efficiency in Cloud RAN Based on Deep Reinforcement Learning," in *Transactions on Emerging Telecommunications Technologies,* (2021), **IF=3.31,** https://doi.org/10.1002/ett.4417.
9. **A. Iqbal**, ML Tham, and YC Chang, "Double deep Q-network-based energy-efficient resource allocation in cloud radio access network," in *IEEE Access* 9, 20440-20449, **IF=3.75**, https://doi.org/10.1109/ACCESS.2021.3054909.
10. **A. Iqbal**, S Shah, and M Amir, "Adaptive Investigating Universal Filtered Multi-Carrier (UFMC) Performance Analysis in 5G Cognitive Radio Based Sensor Network (CSNs)," in *International Journal of Engineering*

Works, 4 (1), 5-9, https://doi.org/10.5281/zenodo.267946.

Conference

1. **A. Iqbal**, A. Al-Habashna, G. Wainer and G. Boudreau "Optimizing Energy Efficiency Performance in RIS-Assisted Near-Field MIMO System Using Deep RL," in *2025 IEEE Annual Modeling and Simulation Conference (ANNSIM25),* Spain.
2. **A. Iqbal**, A. Al-Habashna, G. Wainer, G. Boudreau and F. Bouali, "PPO-Based Energy Efficiency Maximization For RIS-Assisted Multi-User Miso Systems," *2024 IEEE 100th Vehicular Technology Conference (VTC2024-Fall)*, Washington, DC, USA, 2024, pp. 1-6, https://doi.org/10.1109/VTC2024-Fall63153.2024.10757460.
3. Y. J. Wong, M. -L. Tham, B. -H. Kwan, **A. Iqbal,** Y. L. Lee and Y. C. Chang, "Reward-Driven Clustered Federated Learning for DRL Based UAV-RIS Networks," *2023 IEEE 8th ICRAIE*, Kuala Lumpur, Malaysia, 2023, pp. 1-7, https://doi.org/10.1109/ICRAIE59459.2023.10468155.
4. **A. Iqbal**, A. AlHabashna, G. Wainer, F. Bouali, G. Boudreau, K. Wali "Deep Reinforcement Learning-Based Resource Allocation for Secure RIS-aided UAV Communication" *Proc IEEE 98th Vehicular Technology Conference* (*VTC2023-Fall*), September 2023, https://doi.org/10.1109/VTC2023-Fall60731.2023.10333558.
5. M.-L. Tham, Y. J. Wong, **A. Iqbal**, N. Ramli, Y. X. Zhu, and T. Dagiuklas, "Deep Reinforcement Learning for Secrecy Energy-Efficient UAV Communication with Reconfigurable Intelligent Surface," *IEEE Wireless Communications and Networking Conference (WCNC)*, Glasgow, United Kingdom, March 2023, pp. 1-6, https://doi.org/10.1109/WCNC55385.2023.10118891**.**
6. **A. Iqbal**, M. -L. Tham and Y. C. Chang, "Energy- and Spectral- Efficient Optimization in Cloud RAN based on Dueling Double Deep Q-Network," *Proc 2021 IEEE I2CACIS*, 2021, pp. 311-316, https://doi.org/10.1109/I2CACIS52118.2021.9495912.
7. **A. Iqbal**, M. -L. Tham and Y. C. Chang, "Double Deep Q-Network for Power Allocation in Cloud Radio Access Network," *Proc 2020 IEEE 3rd CCET*, 2020, pp. 272-277, https://doi.org/10.1109/CCET50901.2020.9213138.
8. M.-L. Tham, **A. Iqbal**, and Y. C. Chang, "Deep Reinforcement Learning for Resource Allocation in 5G Communications," *Proc. APSIPA ASC*, pp. 18-21, Nov. 2019, https://doi.org/10.1109/APSIPAASC47483.2019.9023112.

CERTIFICATE COURSES

- Python Programming: A Concise Introduction, completed (22-5-2020) from COURSE Academy
- Introduction to Machine Learning: Completed (01-04-2020) from COURSE Academy
- Training on Deep Learning Using Medical Data: (20-09-2020) from FINLAND LABS
- Introduction to Artificial Intelligence (3-credit hours) (18-12-2021) from National Science Information Centre University of Karachi, Karachi -75270, Pakistan.

MEMBERSHIPS, AWARDS & ACHIEVEMENTS

❖ **Memberships**

1. Graduate Student Member of IEEE (2016-2018), Member of IEEE Communication (IEEE ComSoc).
2. Member of Pakistan Engineering Council (PEC) as Registered Engineer (Since 2014) [Signatory body of the Washington Accord].
3. Member of Pakistan Red Crescent Society (PRCS) as Regular Blood Donor (Since 2014).

❖ **Awards & Achievements**

1. PM LAPTOP SCHEME (2015)
2. Fully Funded Ph.D. Scholarship (2019-2022)
3. 3 Years Postdoc Fellowship (2023-2026)

PROFESSIONAL ACTIVITIES

Reviewer for IET Communication, IEEE Access, Computer Material and Continua (CMC), Elsevier,

IEEE System Journal, IEEE China Communications, IEEE TWC, IEEE ICC 2025, IEEE TCE

SOFTWARE SKILLS

Python, TensorFlow, PyTorch, MATLAB, C/C++, LabVIEW, Microsoft Visio, Latex

REFERENCES

To be provided when required