

Maverick Khaf

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AI/ML Researcher & Engineer | Reinforcement Learning | Telecom AI (5G/6G) | Technical Leadership



Portfolio

PROFESSIONAL SUMMARY

PhD candidate in Electrical Engineering with applied experience in telecom AI, reinforcement learning, and standards-aware 5G/6G research. Author of 7 IEEE publications with 250+ combined citations. Proven record of cross-functional collaboration, technical mentoring, and translating research into deployable strategies. Authorized to work in Canada — no visa or work permit required.

CORE SKILLS

AI/ML:	Reinforcement learning (DQN, PPO, SAC, A2C, DDPG, TD3), deep learning, supervised/unsupervised learning, federated learning, model evaluation	Telecom:	5G NR, B5G/6G, O-RAN, 3GPP, network slicing, MEC, cognitive radio, NTN, HAPS, spectrum management
Stack:	Python, PyTorch, TensorFlow, Keras, scikit-learn, ray[rllib], OpenAI Gymnasium, Pandas, NumPy, Git, Linux, C/C++, MATLAB, SQL,	Leadership:	People management, technical mentoring, stakeholder communication, cross-functional execution, IEEE governance

PROFESSIONAL EXPERIENCE

AI Researcher & PhD Candidate — ÉTS Montréal, LaCIME Lab

Montreal, Canada | Jan 2020 – Present

- Designs and evaluates multi-agent RL (DQN, PPO, SAC) methods to optimize resource management in cognitive radio, resulting in 250+ citations.
- Architects federated hierarchical RL frameworks for 6G non-terrestrial networks (NTN/HAPS) to maximize energy and spectrum efficiency.
- Supervises and mentors graduate researchers on AI experimentation pipelines to ensure high-fidelity reproducibility and technical rigor.
- Collaborates with industrial partners to translate theoretical research into deployable 3GPP-aligned technical strategies.

Industrial Intern, 5G AI Research — Ericsson Global AI Accelerator

Montreal, Canada | May 2022 – Jan 2023

- Developed RL-based radio resource allocation models for heterogeneous networks to align prototypes with O-RAN and 3GPP RAN specifications.
- Built benchmarking tools for ultra-reliable low-latency (uRLLC) network slicing, improving latency predictability for mission-critical applications.
- Designed autonomous rollout strategies for cellular deployments to optimize network coverage using reinforcement learning.
- Conducted patent exploration and technical analysis for dynamic spectrum coordination to support multi-operator 5G shared environments.

Lecturer & Research Associate — GIK Institute of Engineering Sciences & Technology

Pakistan | Jan 2019 – Jan 2020

- Taught Communication Theory and Digital Control Systems to 180+ students; designed structured, outcome-focused curricula.
- Designed assessments and supervised capstone projects to bridge the gap between theoretical control systems and practical engineering labs.
- Established the local IEEE Women in Engineering (WIE) chapter to provide professional development and technical mentorship for underrepresented students.

Junior Engineer — Ibrahim Fibers Ltd.

Pakistan | Oct 2018 – Jan 2019

- Automated production data workflows, reducing manual processing effort by ~97% and improving real-time operational reliability.

Research Assistant — Bilkent University

Ankara, Turkey | Sep 2015 – Jun 2018

- Developed spatiotemporal co-kriging models for ionospheric modality interpolation as part of MS thesis research.
- Supported faculty research through literature review and technical implementation; evaluated student coursework.

Research Assistant (Intern) — SciFlare Lab, NUST

Islamabad, Pakistan | Jul 2014 – Sep 2014

- Designed and prototyped a drinking water quality monitoring system using custom sensing modules.
- Conducted cost-benefit analysis of sensor hardware to optimize remote contamination detection system costs.

SELECTED PUBLICATIONS

Federated Hierarchical Reinforcement Learning for Resilient Spectrum Sharing in 6G Non-Terrestrial Networks. Khaf, S., Kaddoum, G. *IEEE Open Journal of the Communications Society*, 2026. [Under review](#)

HAPs-Assisted Cognitive Radio with UE Capability-Centered Cooperation. Khaf, S., Kaddoum, G., Altamimi, M. *IEEE GLOBECOM 2024*, 1317–1322.

Partially Cooperative RL for Hybrid Action CRNs with Imperfect CSI. Khaf, S., Kaddoum, G., de Carvalho Evangelista, J. V. *IEEE Open Journal of the Communications Society* 5, 3762–3774, 2024. [4 citations](#)

Partially Cooperative Scalable Spectrum Sensing in Cognitive Radio Networks Under SDF Attacks. Khaf, S., Alkhodary, M. T., Kaddoum, G. *IEEE Internet of Things Journal* 9(11), 8901–8912, 2021. [20 citations](#)

A Deep Learning Approach for Mobility-Aware and Energy-Efficient Resource Allocation in MEC. Ali, Z., Khaf, S., Abbas, Z. H., Abbas, G., Muhammad, F., Kim, S. *IEEE Access* 8, 179530–179546, 2020. [49 citations](#)

A Deep Learning Approach for Energy Efficient Computational Offloading in Mobile Edge Computing. Ali, Z., Jiao, L., Baker, T., Abbas, G., Abbas, Z. H., Khaf, S. *IEEE Access* 7, 149623–149633, 2019. [173 citations](#)

EDUCATION

PhD, Electrical Engineering — École de technologie supérieure (ÉTS), Canada

Jan 2020 – Present | GPA: 4.3/4.3

Research: Cognitive radio networks, reinforcement learning, beyond-5G/6G systems

MS, Electrical & Electronics Engineering — Bilkent University, Turkey

Sep 2015 – Jun 2018 | GPA: 3.29/4.00

Thesis: Spatiotemporal co-kriging for ionospheric modalities

BE, Electrical Engineering — National University of Sciences & Technology (NUST), Pakistan

Sep 2011 – Jun 2015 | GPA: 3.45/4.00

AWARDS & LEADERSHIP

- Recipient of the IEEE Canada Foundation Women in Engineering Prize
- Recipient of the Fonds de recherche du Québec (FRQ) Doctoral Research Scholarship
- Recipient of the International Peace Scholarship, Philanthropic Educational Organization (PEO)
- Winner, 1st Place ÉTS 3MT and 3rd Place Eastern Region 3MT
- Managed teams of 100+ volunteers for large-scale engineering events
- Led 10+ humanitarian relief campaigns and community outreach initiatives
- Vice Regional Student Representative, IEEE Canada
- Treasurer, IEEE WIE Montreal
- Chair, IEEE ÉTS
- Delivered 20+ technical talks and workshops
- Founded and scaled multiple student clubs and technical communities

Work Authorization: Authorized to work in Canada — no visa or work permit required

Full portfolio, publications, and project details at maverickkhaf.com