Maverick

They/them/iel
Legal Name: Sadia Khaf
Doctoral Candidate
Electrical Engineer

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Education

Jan. 2020 – Present **Doctor of Philosophy in Electrical Engineering**, *École de technologie supérieure*, Canada, *CGPA:4.3/4.3*.
Research Focus: Cognitive Radio Networks, Reinforcement Learning, Beyond 5G (B5G) Networks
Supervisor: Prof. Dr. Georges Kaddoum

Sep. 2015 – Jun. 2018 **Master of Science in Electrical and Electronics Engineering**, *Bilkent University*, Turkey, *CGPA:3.29/4.00*.
Core Courses: Machine Learning, Neural Networks, Medical Imaging, Random Processes, Wireless Communication
Supervisor: Prof. Dr. Orhan Arikan
Thesis Title: *Spatiotemporal Co-Kriging for Ionospheric Modalities*
Description: Learning from past ionospheric data for sparse foF2 and correlated denser TEC to make future predictions for foF2 both in space and time

Sep. 2011 – Jun. 2015 **Bachelor of Electrical Engineering**, *National University of Sciences and Technology*, Pakistan, *CGPA:3.45/4.00*.
Core Courses: Digital Signal Processing, Digital Image Processing, Embedded Systems, Microwave Engineering

Experience

Industrial

May. 2022 – Jan. 2023 **Intern**, *Ericsson*, Canada.
Collaborated with senior engineers on 5G research projects and gained hands-on experience with cutting-edge telecommunications technology.

- Developed reinforcement learning (RL) algorithms to optimize resource allocation in heterogeneous networks (HetNets)
- Analyzed 3GPP and O-RAN specifications to ensure compliance and compatibility with emerging 5G standards
- Researched network roll-out strategies for emergency deployments, focusing on rapid deployment and self-configuration in crisis situations
- Contributed in implementing and testing network slicing solutions for eMBB and uRLLC

Oct. 2018 – Jan. 2019 **Trainee Officer**, *Ibrahim Fibers Ltd.*, Pakistan.
Test programs and databases, perform database integrity checks, and validate production related data
- Automated the previously manual process of daily production upload/interface
  - Achieved 97% reduction in total time
- Implemented production data error checks and warnings
  - Ensured protection against human errors
- Introduced time-sheets for monitoring employee efficiency

Academic

Jan. 2019 – Jan. 2020 **Lecturer/Research Associate**, *Ghulam Ishaq Khan Institute of Engineering Sciences and Technology*, Pakistan.
Designed curriculum based on Communication Theory and Digital Control Systems for third and fourth year undergraduate students
Presented course material in a concise manner that encouraged applied knowledge of theory to real world settings
- Developed, organized, and implemented exams and assessments for students
- Assessed undergraduate projects and assignments
- Delegated course management tasks to teaching assistants and mentored them

Sep. 2015 – Jun. 2018 **Research Assistant**, *Bilkent University*, Turkey.
Supported with faculty research projects, engaged in literature searches
Developed teaching materials, such as syllabus, visual aids, supplementary notes, and course websites
- Ensured content and methods of delivery meet learning objectives
- Assessed undergraduate projects and assignments
- Provided effective, timely and appropriate feedback to students to support their learning

Jun. 2014 – Aug. 2014 **Research Assistant(Intern)**, *SciFlair Lab*, Pakistan.
Planned, researched, designed and developed drinking water quality monitoring system
- Analyzed cost and budget of off-the-shelf chlorine detection sensors vs. development of new techniques
- Organized site surveys and reported existing methods used for ensuring appropriate levels of chlorine in water

Awards and Honors

PhD
- IEEE Canada Foundation Women in Engineering prize
- P.E.O. International Peace scholarship
- Fonds de recherche du Québec (FRQNT) scholarship
- Palmarès Féminin pluriel award
- Three minute thesis (3MT) ÉTS 1st prize winner
- Three minute thesis (3MT) Eastern Region 3rd prize winner
- Bourse d'implication aux cycles supérieurs (2020-2021)
- LaCIME research documentary competition 1st prize
- IEEE Canada Volunteer Appreciation (2020 - 2024)
- IEEE Canada Speaker Recognition (2024)

Masters
- Bilkent Scholarship - The Highest level of academic scholarship for graduate studies awarded by Bilkent University
- Tübitak burs - Research scholarship awarded by The Scientific and Technological Research Council of Turkey (Tübitak)

Bachelors
- NUST Merit Scholarship (GPA-based, 2011-15)
- Ranked in the top 0.1% out of 70,000 candidates (NUST Entry Test 2011)

Leadership
- Vice Regional Student Representative IEEE Canada (2024-Present)
- Treasurer IEEE Women in Engineering Montreal (2023-Present)
- Chair IEEE École de technologie supérieure (2021-Present)
- Industrial Relations Manager IEEE Montreal Young Professionals Montreal (2020-2022)
- Vice Chair IEEE cole de technologie supérieure (2020-2021)
- President TABA Youth Force (2014-2015)
- Team Leader NUST Community Services Club (2014-2015)

Literary Best debater award provincial competitions, Editor of multiple university magazines, Poet (featured in The Rhyme Republic Pakistan-India cross-boarder poetry event)

Skills

Specializations Cognitive Radio Networks (CRN), Non-Terrestrial Networks (NTN), Radio Resource Management (RRM), Edge Computing, 5G/6G Core Networks, 3GPP Standards, Open RAN (O-RAN), Network Slicing, 5G NR, Beyond 5G (B5G)

Languages Python, C/C++, MATLAB

Libraries TensorFlow, PyTorch, Keras, Ray, OpenAI Gymnasium, Scikit-learn, Pandas, NumPy, Matplotlib

Tools Git, API Workflows, ModelSim, Proteus, LabVIEW, PSpice, AutoCAD, Visual Studio, Visual Studio Code, Xilinx, Code Composer Studio

RL DQN, A2C, PPO, DDPG, SAC, TRPO, TD3, Q-learning, SARSA, Policy Gradient Methods, Monte Carlo Methods, Multi-Agent RL

Other ML SVM, KNN, Decision Trees, Random Forest, Logistic Regression, Naive Bayes, K-Means, PCA, Neural Networks (RNN, CNN, LSTM), Cross-validation, Hyperparameter Tuning, Ensemble Methods (XGBoost, LightGBM)

Personal Neurodivergent, Natural Leader, Great event organizer and manager

Publications

2024 Khaf, Sadia, Georges Kaddoum, and Joao Victor de Carvalho Evangelista (2024). "Partially Cooperative RL for Hybrid Action CRNs With Imperfect CSI". In: *IEEE Open Journal of the Communications Society* 5, pp. 3762–3774. DOI: 10.1109/OJCOMS.2024.3416902.

2021 Ali, Zaiwar, Sadia Khaf, Ziaul Haq Abbas, et al. (2021). "A Comprehensive Utility Function for Resource Allocation in Mobile Edge Computing". In: *Computers,*

Materials Continua 66.2, pp. 1461–1477. ISSN: 1546-2226. DOI: 10.32604/cmc.2020.013743. URL: http://dx.doi.org/10.32604/cmc.2020.013743.

2020 Ali, Zaiwar, Sadia Khaf, Ziaul Haq Abbas, et al. (2020). "A Deep Learning Approach for Mobility-Aware and Energy-Efficient Resource Allocation in MEC". In: *IEEE Access* 8, pp. 179530–179546. DOI: 10.1109/ACCESS.2020.3028240.

2019 Ali, Zaiwar, Lei Jiao, et al. (2019). "A Deep Learning Approach for Energy Efficient Computational Offloading in Mobile Edge Computing". In: *IEEE Access* 7, pp. 149623–149633. DOI: 10.1109/ACCESS.2019.2947053.

2018 Khaf, Sadia (June 2018). *Interpolation of ionospheric modalities using kriging, co-kriging and spatio-temporal kriging*. DOI: 10.13140/RG.2.2.19560.62728.

Languages

Native/Bilingual

- Urdu
- Hindi
- Punjabi
- English
  - Level: C1, IELTS: 7.5

Learning

- French
- German
- Turkish