# KASHIF KHAN

kashif.khan@nu.edu.kz | LinkedIn | Google Scholar

## RESEARCH INTERESTS

With a strong background in machine learning (ML) and signal modeling, my primary research interest lies in applying modern ML techniques to solve real-world problems with measurable impact. I aim to develop intelligent systems that can operate reliably in practical environments. My goal is to design ML solutions that are not only accurate but also efficient, interpretable, and applicable to real-time decision-making scenarios.

## EDUCATION

**Nazarbayev University, Astana, Kazakhstan** Aug. 2021- Jun. 2023
**Master of Science** (MSc) in Electrical & Computer Engineering
**Thesis:** Development of Machine Learning-Based Modeling Techniques for Advanced RF Devices
**CGPA:** 3.21/4.0

**University of Engineering & Technology, Peshawar, Pakistan** Aug. 2015- Aug. 2019
**Bachelor of Science** (BSc) in Electrical Engineering
**Thesis:** Road Power Generation using Freewheel Mechanism
**CGPA:** 3.36/4.0

## EXPERIENCE

**Radio Frequency (RF) Research Team, Nazarbayev University** Nov. 2021 - Present
***Research Assistant***

- **High Frequency Filter Design:**
- Demonstrated the potential of ML and evolutionary optimization in accelerating the EM design process for practical applications
- Generated and analyzed large datasets using Advanced Design System (ADS) software, integrating ML models to streamline filter design processes
- Achieved a significant reduction in design time while maintaining high accuracy, enhancing the efficiency of RF filter design for high-frequency communication systems
- Fabricated and tested RF filters to validate ML-based design approaches through real-world measurements
- Utilized advanced data analysis techniques and programming skills to achieve research objectives
- **Behavioral Modeling of Advanced RF Devices:**
- Investigated and compared multiple ML algorithms (ANN, RBNNs, GRNN, XGBoost, GPR) for behavioral modeling of GaN HEMTs, initially up to 40 GHz and currently extending exploration to 120 GHz.
- Applied global optimization techniques to fine-tune model hyperparameters for improved accuracy and generalization.
- Contributed to multi-institutional research projects focused on nonlinear modeling of high-frequency RF components.
- Co-authored several publications in reputable IEEE flagship conferences.

**Teaching Machine Learning and Programming at Invest In Kids, Astana, Kazakhstan** Feb. 2023 - Present
***Instructor***

- Developed and delivered comprehensive lessons on Python programming, ML fundamentals, and advanced ML models, tailored to engage and educate students
- Facilitated hands-on learning experiences by guiding students through real-world projects, enabling them to build practical skills in programming, data analysis, and AI applications

- Mentored students in innovative problem-solving approaches, fostering creativity and enthusiasm for technology, AI, and critical thinking.
- Designed interactive teaching materials and simplified complex concepts to make ML accessible and engaging for beginners
- Encouraged collaborative learning through group activities, coding challenges, and project-based assignments, creating an inclusive and supportive environment for young learners

**PASBAN Human Rights, Protection & Welfare Organization, Peshawar, Pakistan** 2016 - 2021
***General Secretary***

- Organized and facilitated meetings, ensuring effective coordination and adherence to schedules
- Maintained comprehensive records and managed administrative tasks to support organizational efficiency
- Ensured compliance with legal requirements and governing documents, maintaining clear communication and correspondence with stakeholders
- Enhanced organizational communication by effectively managing internal and external correspondence

## PUBLICATIONS

### Journal Articles

1. **K. Khan**, S. Husain, M. Hashmi, "GWO-ANN Based Approach for High-Frequency Microstrip Filter Design and Optimization," *Procedia Computer Science* (Accepted, Elsevier, **Scopus Indexed**, CPCI).
2. **K. Khan**, S. Husain, A. Jarndal, M. Hashmi, "Hybrid Approach for Performance Optimization of Gallium Nitride High Electron Mobility Transistors Small-Signal Behavioral Models," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields* (Under Review, Wiley, **SCIE Indexed – Web of Science, Scopus**).

### Conference Papers (IEEE Indexed)

1. **K. Khan**, S. Husain, A. Jarndal, M. Hashmi, "Development and Assessment of ML Based GaN HEMTs Small-Signal Modelling Techniques," *36th IEEE International Conference on Microelectronics (ICM)*, Doha, Qatar, Dec. 2024.
2. **K. Khan**, S. Husain, G. Nauryzbayev, M. Hashmi, "Development and Evaluation of ANN, RBNNs, and GRNNs Based Small-Signal Behavioral Models for GaN HEMT Up to 40 GHz," *IEEE Midwest Symposium on Circuits and Systems (MWSCAS)*, Springfield, USA, Aug. 2024.
3. **K. Khan**, S. Husain, G. Nauryzbayev, M. Hashmi, "Development and Evaluation of ANN, ACOR-ANN, ALO-ANN Based Small-Signal Behavioral Models for GaN-on-Si HEMT," *30th IEEE International Conference on Electronics, Circuits and Systems (ICECS)*, Istanbul, Türkiye, Dec. 2023, pp. 1–4.
4. **K. Khan**, S. Husain, G. Nauryzbayev, M. Hashmi, "On Temperature-Dependent Small-Signal Behavioral Modelling of GaN HEMT Using GWO-PSO and WOA," *IEEE Int'l Symposium on Networks, Computers and Communications (ISNCC)*, Doha, Qatar, Oct. 2023, pp. 1–6.
5. S. Husain, **K. Khan**, G. Nauryzbayev, M. Hashmi, "Temperature Dependent I-V Models for Microwave Transistor Using Radial Basis NNs, Generalized Regression NNs and Feedforward NN," *5th IEEE Int'l Conference on Multimedia, Signal Processing and Communication Technologies (IMPACT)*, Aligarh, India, Dec. 2022, pp. 1–5.

## AWARDS AND ACHIEVEMENTS

- **Best Paper Award (Research)** at International Symposium on Networks, Computers and Communications (ISNCC), Doha, Qatar, 2023.
- **Best Paper Award (Research)** at International Conference on Multimedia, Signal Processing, and Communication Technologies, India, 2022.

- **Fully Funded Scholarship (Abay Kunanbayev) Holder** for a Master's degree at Nazarbayev University, Astana, Kazakhstan.
- **Fully Funded Scholarship (Diya Pakistan) Holder** for a Bachelor's degree at the University of Engineering & Technology, Peshawar, Pakistan.
- **Prime Minister's Laptop Award** for Academic Excellence in BSc..
- **Fully Funded Scholarship (Goodwill) Holder** at Peshawar Model Degree College, Peshawar, Pakistan.

## ONLINE COURSES

- **Data Science Tools**, offered by IBM – Certificate of Completion (DS0105EN).
- **Deep Learning Fundamentals with Keras**, offered by IBM – Certificate of Completion(DL0101EN).
- **Data Science with Python**, offered by Simplilearn – Certificate of Completion (4405431).

## TECHNICAL STRENGTHS

**Programming Languages**

- C, C++, Python (Libraries: Scikit-learn, TensorFlow & Keras, Matplotlib, Seaborn, Pandas, NumPy)

**Simulation & Modeling Tools**

- MATLAB/Python (System-level Modeling), ADS (EM Circuit Simulation), Mathematica, Anaconda (Spyder, Jupyter Notebook etc.)

**Applied ML Algorithms**

- ANN, RBNN, GRNN, GPR, GBM, LightGBM, XGBoost

**Global Optimization Algorithms**

- Grey Wolf, Black Hole, Reptile Search, Spotted Hyena Optimizer, Ant Lion, Whale Optimization

## SOFT SKILLS

- **Research Planning:** Experienced in defining research methodology, literature reviews, and simulation setups—core requirements for successful PhD research execution.
- **Effective Communication:** Proficient in conveying ideas clearly and concisely, both verbally and in writing.
- **Team Collaboration:** Strong ability to work independently and collaboratively in diverse teams, contributing to a positive and productive team environment.
- **Problem Solving:** Adept at identifying issues and implementing innovative solutions to overcome challenges.
- **Adaptability:** Capable of adjusting to new situations, new people and changing environments with ease.

## LANGUAGES

- English: **IELTS Band Score 7.0 (CEFR Level C1)** – proficient in academic and research communication.
- Pashto (Maternal), Urdu (Proficient)