KHIZAR ANJUM
+1 (908) 963-7363 • khizaranjum28@gmail.com • khizar.anjum@rutgers.edu • LinkedIn | CPSLab@Rutgers | GitHub | Google Scholar (104 citations, h-index: 6, i10-index: 5)

RELEVANT PERSONAL HIGHLIGHTS

- **Extensive ML Research Experience:** Specialized in developing efficient deep learning architectures for various applications, with focus on resource-constrained devices. Published in prestigious journals including IEEE JBHI, IEEE JSAC and conferences like IEEE PerCom, MASS, and UComms.
- **Proven Expertise in PyTorch & TensorFlow:** 6+ years of experience with PyTorch, TensorFlow, and other ML frameworks. Proficient in Python data science stack (NumPy, Pandas, scikit-learn) and MLOps tools like MLflow and LangChain for experiment tracking.

RESEARCH INTERESTS

Deep Learning, Efficient Neural Network Architectures, Large Language Models, Computer Vision, Resource-constrained ML Systems, Robotics, Analog Neural Networks, Numerical Optimization, Parallel and Distributed Computing, Edge AI Solutions for DSP & FPGA systems

EDUCATION

- **Rutgers University, New Brunswick, NJ (2019 – 2025 [expected])**
  PhD Candidate, Electrical and Computer Engineering (ECE)
  Grade Point Average (GPA): 4.00/4
  Master of Science (MS), Electrical and Computer Engineering (ECE)
  Grade Point Average (GPA): 3.86/4
  Advised by Dr. Dario Pompili
- **Lahore University of Management Sciences (LUMS), Lahore, Pakistan (2015–2019)**
  Bachelor of Science (BS), Electrical Engineering (EE)
  Advised by Dr. Muhammad Tahir and Dr. Momin Uppal; Grade Point Average (GPA): 3.86/4

SELECTED RESEARCH PROJECTS

- **Ultra-Low Power Analog Neural Network Design for Health Monitoring** —2023/24
  Developed novel analog neural network architectures for ECG/EEG processing achieving micro-watt power consumption, published in IEEE JSAC and JBHI. Led NSF I-Corps customer discovery with 20 industry interviews to validate clinical needs.
- **Deep Joint Source Channel Coding for Underwater Image & Video Transmission** — 2022
  Developed a model using PyTorch for integrating deep learning models into complex DSP systems, demonstrated efficacy using real-world underwater datasets.
- **Crowd Prediction and Behavior Assessment Using Adaptive UAVs** — 2024
  Leveraging multimodal deep learning systems to predict real-time high-density crowd patterns from UAVs using transformer-based neural networks.
- **Adaptive Scalable Video Transmission in Underwater Acoustic Networks** — 2024
  Built a scalable, real-time video transmission system using cutting-edge neural compression techniques, demonstrating robust performance in dynamic acoustic environments.

RELEVANT SKILLS

- **Programming Languages**: Python (advanced), C++, CUDA, MATLAB, Bash
- **ML & AI Tools**: PyTorch, TensorFlow, OpenCV, Pandas, Jupyter, MLOps, Tensorboard

- **Edge Computing & DSP**: GNU Radio, ROS, low-power analog-digital ML systems
- **Deployment Environments**: Linux, Windows, FPGA, Embedded Systems (real-time AI)

PATENTS

- **WO 2024/107672:** Techniques for Image Transmission through Acoustic Channels in Underwater Environments
- **WO 2025/064997:** Anisotropic Diffusion-based Analog Neural Network Architecture
- **(Pending Application):** Methods and Systems for Determining Group Motion Patterns

SELECTED CONFERENCE PUBLICATIONS

- **K. Anjum**, and D. Pompili, "Anisotropic Diffusion-based Analog CNN Architecture for Continuous EEG Monitoring," — **IEEE MASS, 2023.**
  Proposed a novel patented anisotropic diffusion-based analog CNN architecture.
- YT. Hsieh, **K. Anjum,** and D. Pompili. "Ultra-low power analog recurrent neural network design approximation for wireless health monitoring," — **IEEE MASS, 2022.**
  Proposed a ultra-low power analog design for monitoring the heart in real-time.
- **K. Anjum,** T. Chowdhury, S. Mandava, B. Piccoli, and D. Pompili, "Leveraging On-board UAV Motion Estimation for Lightweight Macroscopic Crowd Identification" — **IEEE PerCom, 2024**
  Work demonstrated spatio-temporal crowd pattern prediction on UAVs in just 2 ms.
- **K. Anjum,** Z. Qi, and D. Pompili, "Deep Joint Source Channel Coding for Underwater Image Transmission," — **WUWNet, 2022**
  Pioneered the application of deep joint source-channel coding models in underwater channels.

SELECTED JOURNAL PUBLICATIONS

- **K. Anjum**, and D. Pompili, "Battery-less Implantable Continuous EEG Monitoring via Anisotropic Diffusion," **IEEE Journal on Selected Areas in Communications (JSAC), 2024**.
  Developed novel analog neural network architecture for continuous EEG monitoring that operates by harvesting micro-watts of power from thermal gradients.
- YT. Hsieh, **K. Anjum,** and D. Pompili. "Ultra-low Power Analog Neural Network for Cardiovascular Health Monitoring," **IEEE Journal of Biomedical and Health Informatics, 2024**.
  Developed novel analog neural network architecture for ECG processing that achieves ultra-low power consumption through efficient signal processing for real-time monitoring.
- **K. Anjum,** V. Sadhu, and D. Pompili, "Deep Learning-based Unmanned Aerial Vehicle Fault Detection via FPGAs" — **IEEE Transactions on Robotics, 2023**. Led this groundbreaking study on fault detection in UAVs using embedded AI and FPGAs resulting in 40x reduction in latency.

ACHIEVEMENTS

- Recipient of **Paul Panayotatos Scholarship** for Sustainability-aware Electrical Engineering, 2024
- Selected for **NSF NOVUS & NSF I-Corps** programs for innovation & customer discovery training, 2022
- Awarded **Travel Grants** from Rutgers University and ACM for **ACM WUWNet** and **IEEE MASS** participation
- Recognized with **Gold Medal** at LUMS for academic excellence, 2019
- Win: **TA Achievement Award**, 2020 from Rutgers

REFERENCES

Available upon request