Noor Fatima

+92-327-8734825 | noorfatimaafzalbutt@gmail.com | LinkedIn | GitHub

Education

BS in Computer Engineering 2023 – Expected 2027
University of Engineering and Technology, Lahore, Pakistan *CGPA: 3.79/4.0 (Top 3 in session)*

Experience

Research Intern May 2025 – Present
National Center for Quantum Computing (NCQC), Lahore, Pakistan

- Exploring **quantum algorithms** for healthcare diagnostics in a 5-member interdisciplinary team.
- Developed a QAOA-based feature selection approach with a Variational Quantum Classifier (VQC) for asthma diagnosis on 2000+ patient samples.
- Achieved **98.4% accuracy**, showing a **+3.7%** improvement over classical baselines.

Research Assistant June 2024 – Present
Al-Khawarizmi Institute of Computer Science (KICS), Lahore, Pakistan

- Assessed EEG-based **emotion recognition** pipeline on 3 datasets (150+ subjects).
- Developed ERP-based Alzheimer's/MCI classifier using 80+ patient EEGs for early screening studies.
- Enhanced stress-decoding by integrating computational neuroscience models.

Machine Learning Intern Mar 2024 – Jun 2024
Datalabb, Lahore, Pakistan

- Co-developed U-Net segmentation framework for 10k+ medical images; delivered **90% mean Dice score** and reduced manual annotation by 80%.
- Fine-tuned domain-adapted LLMs for clinical text, increasing reliability by **22%** and deployed for research staff.

Machine Learning Fellow Jun 2024 – Sep 2024
Bytewise Limited, Lahore

- Selected among top **9% of 2,300+ applicants**; completed 8+ projects in ML modeling and data analysis.
- Automated preprocessing workflows, cutting runtime from 2 days to under 6 hours, accelerating project delivery.

Selected Projects

NeuroAI | Deployed App | GitHub June 2025 – Present
Tech Stack: Python, PyTorch, MNE, ReactJS, Docker, AWS

- Built EEG platform for data ingestion, benchmarking, and annotation workflows.
- Launched a web interface tested by 5+ researchers, reducing model testing from **2–3 days** to **minutes**.

Real-time Seizure Detection, Classification & Forecasting May 2025 – July 2025
Tech Stack: Python, PyTorch Geometric, MNE, GNNs

- Developed a GNN system for seizure detection using **TUH EEG** (largest open EEG corpus).
- Reached **90% detection**, **87% type classification**, and **84% early prediction**, approaching published clinical benchmarks.

Cognitive & Energy-Efficient Sleep Stage Classification Feb 2025 – March 2025
Tech Stack: Python, Tensorflow, snnTorch, MNE

- Applied Spiking Neural Networks (SNNs) to **ISRUC-Sleep** (118 subjects) for low-power sleep monitoring.
- Achieved **82% accuracy** while reducing energy consumption by **35%**, demonstrating feasibility of mobile clinical devices.

Multiview Neural Decoding for RSVP-Based EEG Nov 2024 – Jan 2025
Tech Stack: Python, PyTorch, MNE, Attention Mechanisms

- Built attention-based decoder combining temporal, spectral, and spatial EEG features.
- Outperformed prior work by +2.3% with **93.3% accuracy** on Tsinghua & PhysioNet datasets (500+ subjects).

Technical Skills

Languages: C++, Python, MATLAB, LaTeX | **Frameworks:** PyTorch, TensorFlow, Scikit-learn, PennyLane, Qiskit | **Tools:** MNE, NumPy, Pandas, Matplotlib, Seaborn, OpenCV | **Research Interests:** EEG & fMRI Analysis, Deep Learning, Signal Processing, Quantum Computing

Publications (Under Review)

1. N. Fatima, G. Nabi, A. Afzal, M. Rizwan, O. Bagdasar, and K. Manuella, "NeuroGraph-TSC: A Neuro-Inspired Graph-Based Temporal-Spatial Classifier for Cognitive State Prediction from EEG". Submitted to *Scientific Reports*.

2. N. Fatima and G. Nabi, "Multimodal EEG-Based Classification of Alzheimer's and MCI Using Olfactory Event-Related Potentials and Transformers," Submitted to *Brain-Apparatus Communication*.

3. G. Nabi, N. Fatima, A. Afzal, S. Yonbawi, and M. Rizwan, "Quantum-Enhanced Feature Selection and Classification for Asthma Diagnosis Using a Variational Quantum Classifier". Submitted to *IEEE Journal of Quantum Electronics*.

Honors & Awards

- **Excellence in Neuroscience Research**, KICS-UET Lahore *June 2025*
  Recognized for contributions to signal processing, Neuro-AI pipelines, and innovative neuroscience methods.

- **Chief Minister Punjab's Honhaar Scholarship**, Government of Punjab *May 2025*
  Awarded for achieving one of the highest CGPAs (top 1%) in Computer Engineering at UET Lahores.

- **Top 6 at Optimized AI Conference 2025**, Traversaal.ai *Mar 2025*
  Our Team TROJAN_AI ranked among the Top 6 out of 200+ global teams, part of OAI 2025 (Atlanta).

- **CS50x Puzzle Day 2025**, Harvard & MIT (Cambridge) *Apr 2025*
  Recognized for outstanding performance in problem-solving, teamwork, and analytical thinking.

Certificates

Supervised Machine Learning: Regression and Classification *by DeepLearning.AI*
Deep Learning with PyTorch: Image Segmentation *by Coursera Project Network*
Introduction to Artificial Intelligence *by Google*
Fundamentals of Machine Learning *by Microsoft*
The Nuts and Bolts of Machine Learning *by Google*
Crash Course on Python *by Google*

Invited Talks

- **AI for Brain: Unlocking Cognitive Insights with Machine Learning** | Slides
  Invited Talk at *ACM UET Lahore Chapter* *August 2025*
  Engaged 100+ students, and faculty in exploring machine learning applications for cognitive neuroscience.

- **Data-Centric AI: Why Better Data Beats Bigger Models** | Slides
  Invited Talk at *Google Developer Group (GDG), UET Lahore* *August 2025*
  Addressed 50+ AI enthusiasts and students, emphasizing how high-quality datasets drive real-world AI success.