Ahmad Raza

+92345-0080906 | ahmadrazacdx@gmail.com | Bhakkar, Punjab, Pakistan

ahmadrazacdx.github.io | linkedin.com/in/ahmadrazacdx | github.com/ahmadrazacdx

SUMMARY

Deep Learning Practitioner and Software Engineering Undergraduate with a research focus on bridging biological intelligence and artificial systems. Specializes in First-Principles Thinking, implementing complex architectures (LSTM, GRU, Attention) from scratch to understand architectural and optimization dynamics. Combines strong theoretical foundations in Natural Language Processing with practical expertise in MLOps and scalable system design.

EDUCATION

Thal University   Bhakkar, Punjab
Bachelor of Science in Software Engineering   *Oct. 2022 – May 2026*
- **CGPA**: 3.82/4.0
- Relevant Coursework: Data Structures & Algorithms, Web Engineering, Database Systems, Cloud Computing

PROJECTS

Seq Modeling From Scratch | *Python, NumPy, Math* | GitHub   Nov. 2025
- Implemented **RNN**, **LSTM**, and **GRU** from first principles without auto-differentiation frameworks to master gating mechanisms and computational graphs.
- Manually derived and coded forward and backward passes (Backpropagation Through Time) to manage gradient flow in dynamic networks and enable training.
- Built **Seq2Seq** models with **Bahdanau** and **Luong attention** mechanisms specifically for language modeling tasks.
- Trained character and word-level **language models** on text datasets to demonstrate practical sequence learning.

NeuroScope | *Python, NumPy, Matplotlib* | GitHub | PyPI | Docs   Sep 2025
- Engineered a production-grade Python **framework** for informed training and diagnosis of neural networks.
- Developed a real-time diagnostics system monitoring **10** health indicators (e.g., Dead Neurons, Gradient SNR, Weight Update Ratios) and a comprehensive analytics and evaluation system validated against research by Glorot, He, and Pascanu.
- Designed dynamic visualizations for neuron activation, gradients, and weights histograms and evolution plots to track training dynamics.
- Maintained **60%+** test coverage and automated **PyPI** publishing workflows via GitHub Actions.

House Oracle | *Python, Flask, XGBoost, Optuna, JS* | GitHub | Live   April 2025
- Developed a dual-model regression system (Rent vs. Sale) using **XGBoost** on **168k+** houses listings from major cities in Pakistan, achieving an **R²-Score of 0.86** and **MAPE of ∼21%**.
- Implemented **Bayesian Hyperparameter Optimization** via **Optuna** (100 iterations) to fine-tune regressors, outperforming Random Forest and Gradient Boosting baselines.
- Deployed a decoupled **Flask REST API** on Hugging Face Spaces to serve real-time predictions and property recommendations with a **92% similarity score**.
- Engineered a high-performance frontend using **AG-Grid** for handling large datasets and **Chart.js** for interactive market visualization, optimized for client-side rendering.

TECHNICAL WRITING & RESEARCH

A Synthesis of Biological and Computational Learning | Read Article   Dec. 2025
- Authored a comprehensive analysis connecting synaptic plasticity (LTP/STDP) with Backpropagation and Transformers.
- Synthesized literature from Hebb (1949) to Vaswani (2017) to explore the Information Bottleneck Theory.
- Examined the divergence between biological efficiency ($\approx 20W$) and current LLM training paradigms.

Technical Skills

Deep Learning & ML: LLMs, Transformers, Fine tuning, Sequence Models, Representation Learning, Deep Neural Networks, Classical ML Theory
Foundations: Linear Algebra, Calculus, Probability Theory, Statistics
MLOps & Cloud: Docker, Kubernetes, CI/CD Pipelines, Model Deployment, AWS
Languages & Libraries: Python, NumPy, Matplotlib, Seaborn, Scikit-Learn, XGBoost, PyTorch, JavaScript, HTML/CSS, SQL

Certifications

DeepLearning.AI (Coursera): Deep Learning Specialization, Machine Learning Specialization, Mathematics for Machine Learning & Data Science Specialization
Other Specializations: MLOps Specialization (Duke University), IBM Machine Learning Professional Certificate