Muhammad Asif Ali Khan

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Motivated MS Data Science graduate with hands-on experience in Machine Learning, NLP, Deep Learning, Computer Vision, Federated Learning, and Distributed Data Processing. Strong grasp of statistical modeling, data visualization, and data analysis, with expertise in Python, R, SQL, Power BI, Tableau, Excel, and Google Sheets. Passionate about teaching and mentoring students in Data Science, Machine Learning, and AI concepts.

SKILLS

Programming Languages: Python, R

ML/DL Frameworks: TensorFlow, PyTorch, Keras, Scikit-learn, NLTK

NLP: Sentiment Analysis, Text Classification, LangChain, Word Embeddings (Word2Vec, GloVe, TF-IDF), Transformers (BERT, GPT)

Deep Learning: CNN, RNN, LSTM, Transformers

Computer vision: YOLOvs5

Data Analytics & Visualization: Pandas, NumPy, PyCaret, Seaborn, Matplotlib, Plotly, ggplot

Tools: Jupyter Notebook, Google Colab, VS Code

EXPERIENCE

TEACHING EXPERIENCE

Home Tutor | Self-Employed | Islamabad, Pakistan **Oct 2021 – Dec 2022**

- **Experience: 1.5 Years**
- Provided one-on-one academic tutoring to school/college students, simplifying complex concepts through structured lesson plans and personalized teaching methods.
- Designed customized study material and practice exercises tailored to individual learning needs, improving student comprehension and academic performance.
- Mentored students in problem-solving, critical thinking, and exam preparation strategies, contributing to measurable improvement in grades.

AI Engineer Intern | Eziline Software House | Islamabad Pakistan **Feb 2026 – Present**

- Built and deployed a Flask-based Machine Learning web app for real-time classification of abusive vs. non-abusive Roman Urdu comments using NLP, text preprocessing, and TF-IDF features, achieving 88% classification accuracy across multiple trained classifiers.
- Designed a 2D U-Net deep learning model for brain tumor segmentation on multi-modal MRI scans, achieving a Dice score of 0.85, with preprocessing, IoU evaluation, prediction overlay visualization, and a Streamlit UI.
- Developed a Streamlit-based NLP application for real-time emotion detection from English text, achieving 90% model accuracy with confidence-score prediction.
- Engineered and deployed an AI Voice Assistant web app using Streamlit, GroqCloud LLM, Whisper-based Speech-to-Text, and gTTS Text-to-Speech, enabling browser-based voice interaction with real-time audio responses.
- Built a real-time object detection pipeline using PyTorch and YOLOv5s (fine-tuned on PASCAL VOC, 20 classes), with automated preprocessing, annotation conversion, webcam/video inference, and ONNX/TorchScript export for edge deployment readiness.

PROJECTS

Book Recommendation System | Shifa Tameer-e-Millat University **Aug 2024**

- Created a hybrid book recommendation system combining collaborative and content-based filtering, using NLP for text preprocessing and feature extraction from book descriptions; deployed via Flask/Streamlit for personalized, interactive recommendations.

Bank Churn Prediction using Deep Learning **Oct 2025**

- Implemented a deep neural network to predict customer churn on real-world bank data with 88% accuracy, using SHAP for explainable AI (XAI) and feature importance analysis to improve model interpretability.

House Price Prediction **June 2025**

- Trained a regression model to predict house prices on the Kaggle dataset, applying feature engineering and hyperparameter tuning to achieve a high R^2 score using Gradient Boosting and Random Forest.

Student Stress Level Classifier **Jan 2026 – March 2026**

- Constructed a multi-class ML model (Logistic Regression) to classify student stress levels (Low/Medium/High) with 90% accuracy, deployed via a Streamlit dashboard with real-time predictions, confidence scores, and personalized health recommendations.

EDUCATION

MS Data Science | Shifa Tameer-e-Millat University, Islamabad **May 2024 – March 2026**

- Silver Medalist
- **Relevant Coursework:** Machine Learning, Statistical and Mathematical Methods for Data Science, NLP, Data Distribution Processes, Tools and Techniques, Computer Vision, Deep Learning
- **CGPA:** 3.64/4.0

BS Mathematics | International Islamic University Islamabad **Sep 2019 – Oct 2019**

- **Relevant coursework:** Linear Algebra, Calculus, Topology, Ring Theory, Software Tool, Theory of Module, Differential Geometry, Functional Analysis, Complex Analysis
- **CGPA:** 3.05/4.0

RESEARCH AREA

Federated Learning

Title: A Contribution-Aware Aggregation in Federated Learning

- Architected a contribution-aware Federated Learning framework to improve model stability under non-IID data and partial client participation.
- Integrated FedProx-style proximal local training with FW-Shapley contribution estimation and Beta-Shapley coalition sampling for scalable, efficient client utility measurement.
- Designed dynamic aggregation weights to amplify high-utility client updates and suppress low-utility/harmful ones.
- Evaluated on MNIST and Fashion-MNIST, achieving smoother convergence and improved generalization over FedAvg, FedProx, SFedAvg, and GreedyFed.

Publication

Title: SimFL-FWShapley: Efficient and Drift-Aware Shapley-Based Credit Assignment for Federated GBDT Learning

- **Journal:** Applied Soft Computing Journal
- **Submitted:** ASOC-D-26-10099