HAIDER ALI

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Education

BS Artificial Intelligence   Oct 2021 – June 2025
Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, Haripur, Pakistan
Relevant Coursework: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Edge AI, Federated Learning, Secure ML Systems

Internships

AI Research Intern – AITec, Islamabad   July 2024 – Dec 2024

- Co-authored the **IJCNN 2025** paper "Edge-Enabled Federated Learning for Predictive Energy Modeling" using a CNN-BiLSTM hybrid FL framework, achieving state-of-the-art performance on multi-building energy datasets
- Developed **secure aggregation protocols** ensuring data confidentiality while enabling collaborative model training across edge devices
- Deployed and tested models on **Jetson Orin Nano** and **Jetson Xavier NX**, achieving real-time inference.

Machine Learning Intern – CodeClause (Remote)   Jun 2023 – Aug 2023

- Built end-to-end ML pipelines: data preprocessing, feature engineering, model training & tuning
- Delivered optimized classification and regression models, adhering to best practices

Python Developer Intern – Robotics World, Abbottabad   Jul 2022 – Sep 2022

- Automated data extraction and processing pipelines using Python, Selenium, and BeautifulSoup.
- Implemented and evaluated ML models (Linear and Logistic Regression) for predictive analytics
- Gained foundational experience in writing production-ready code and deploying ML solutions

Research Experience

AI Researcher (Full-time)
Artificial Intelligence Technology Center (AITec), Islamabad   Dec 2024 – Present

- Leading research on **secure aggregation in federated learning** for encrypted model weight transmission, implementing cryptographic protocols that prevent server-side client identification while maintaining model accuracy
- Developing custom **single-object tracking systems** combining classical CV techniques (SIFT, SURF, ORB) with deep-learning models (SiamFC, SiamRPN++, SiamMask) for real-world deployment on Jetson Nano
- Preparing to present an **ICSBC 2025** paper on encrypted model aggregation in federated learning at the international conference in Oman
- Expertise in **distributed training**, **edge AI optimization**, **secure ML pipelines**, **privacy-preserving systems**, and **Transformer model implementation**

Publications

1. **Haider Ali**, Faizan Hamayat, Maha Driss, Jan Sher Khan.
   "Edge-Enabled Federated Learning for Predictive Energy Modeling in Multi-Building Systems."
   Accepted at International Joint Conference on Neural Networks (IJCNN 2025).

2. **"Transformer-Driven Secure Federated Learning for Privacy-aware Building Energy Forecasting"**
   International Conference on Smart Blockchain and Computing (ICSBC 2025) – Under Review

3. **"Single Object Tracking with Classical and Deep Learning Models in Dynamic Environments"**

Technical Skills

Languages: Python, C++, SQL, TypeScript
Frameworks & Libraries: TensorFlow, PyTorch, Keras, OpenCV, Scikit-learn, LangChain, Hugging Face
Tools: Git, Docker, Kubernetes, VSCode, Google Colab, Streamlit, Supabase
Edge & DevOps: Jetson Nano/Xavier NX/Orin Nano, CUDA, Kafka, Linux, REST APIs,

Key Projects

- **Final Year Project – Federated Learning for Energy Consumption Prediction**
  Privacy-preserving FL system using LSTM and Dockerized edge nodes with Kafka streaming.
  GitHub

- **PDF Q&A Chatbot with ChatGPT API**

  Built a retrieval-augmented chatbot that extracts context-aware answers from user PDFs.

- **Image Deblurring with DeblurGAN-v2**

  Developed GAN-based restoration tool using residual blocks for real-world blurry images. GitHub

- **Potato Leaf Disease Detection**

  CNN model trained to detect plant disease with high accuracy. GitHub

- **Image Classification with AlexNet & CIFAR-10**
  CNN-based image classifier with real-time inference UI. Hugging Face

- **YOLO-based Vehicle Tracking**

  Edge-deployed object detection with speed estimation for real-time video feeds.

- **Twitter Sentiment Analysis App**

  Built a Streamlit interface with TF-IDF + Random Forest for tweet classification. Github

- **Classification between HAPPY and SAD people images**
  I developed a CNN model to classify facial expressions into happy and sad categories. This project required training the model on image datasets, performing hyperparameter tuning, and evaluating the model's performance, which highlights my expertise in image classification tasks. Github

Certifications

- **Python for Everybody** (Specialization)– University of Michigan (Coursera)

- **AI for Everyone** – DeepLearning.AI

- **Data Analysis with Python** – IBM

- **Exploratory Data Analysis for Machine Learning** – IBM

Conferences & Seminar

Artificial Intelligence Conference & Expo 2024
Pak-Austria Fachhochschule Institute of Applied Sciences & Technology, Haripur

Attended the Artificial Intelligence Conference & Expo 2024, engaging in hands-on workshops focused on advanced AI technologies. Acquired practical experience in Generative AI, developed a lightweight face recognition app using Convolutional Neural Networks (CNN), and explored sophisticated techniques in computer vision. Enhanced my technical skills and gained valuable insights into real-world AI applications and implementation strategies

Interests

- **Federated Learning & Edge AI**: Real-time secure model training on distributed nodes

- **Computer Vision**: Tracking, detection, restoration, and deployment on low-power devices

- **Secure Machine Learning**: Encryption, privacy-preserving protocols, and multi-party computation

- **NLP & Generative AI**: Conversational agents, document summarization, transformers, GANs

- **MLOps & Deployment**: End-to-end ML pipeline automation with CI/CD, Docker, Kubernetes orchestration, model versioning, and monitoring