Muhammad Arbab Arshad

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Education

Iowa State University — Iowa, USA
Ph.D. (Computer Science) — *Jan. 2022 – Dec 2025*

American University of Sharjah — Sharjah, UAE
M.S (Computer Engineering) — *Aug. 2019 – Aug 2021*

Lahore University of Management Sciences — Lahore, PK
B.S (Computer Science) — *Aug. 2015 – May 2019*

Experience

Software Engineering Intern — 05/2022 – 08/2022
Kingland — *Iowa, USA*

- Implemented auto-scaling on AWS Fargate; validated container duplication and optimized resource usage.
- Created an end-to-end stress test pipeline, using JMeter for scripting and Blazemeter via Taurus for cloud execution.
- Customized GitLab CI/CD pipeline for seamless test execution, ensuring no disruption to AWS resources or development work.
- Recognized in two sprint retrospectives for establishing comprehensive load testing baseline.

Research Assistant - ML — May 2022 – August 2022
Laboratory for Software Design — *Iowa, USA*

- Contributed to executing 5 automated program repair tools for an empirical study on SLURM-based GPU clusters.
- Optimized execution time by 16x through parallel execution of tools on 40 GPU clusters.
- Received Distinguished Paper Award at the 38th IEEE/ACM International Conference on Automated Software Engineering for the publication.

Machine Learning Engineer — May 2020 – Dec 2021
OpenUAE — *Sharjah, UAE*

- Developed and fine-tuned 12 ML models with 50 million records to predict monthly electricity usage in Dubai, achieving 92.5% accuracy.
- Led a 6-person team in model analysis and achieved 10x faster training times using advanced algorithmic optimization techniques.

Projects

MeditateGPT | *MERN Stack, GPT-3 API, Amazon Polly, AWS S3*

- Designed and developed MeditateGPT, an application for customized guided meditations using GPT-3, which allows users to input prompts for personalized sessions.
- Leveraged SSML and Amazon Polly's TTS API to synthesize natural-sounding audio for the meditation sessions.

Adapting Image Clustering for Audio Analysis of Bat Behaviors - Masters Thesis | *Python, Keras, TensorFlow, PyTorch*

- Adapted unsupervised ML image clustering algorithms to audio data for bat behavior analysis using echolocation calls.
- Implemented IMSAT, IIC, SCAN, JULE, and DeepCluster algorithms and achieved an accuracy of 88.28% in classifying bats.

Utilizing GANs for Emotional Melody Generation | *Python, Keras*

- Developed a text-to-audio generation system for poetry-to-melody using Generative Adversarial Networks (GANs).
- Generated melodies with 68% perceived similarity to real melodies.

Amazon Elastic Inference for assistance in Intrusion Detection | *Java, AWS EC2, Keras*

- Utilized Amazon Elastic Inference (EI) to remotely detect SSH and FTP brute-force attacks in traffic data, eliminating the need for on-site deployment/training of ML models.
- Achieved F1 score of 99% and increased speed by 8x with the model deployed on EI compared to local inference.

Technical Skills

Deep Learning: Python, R, Keras, CUDA, TensorFlow, PyTorch, Scikit-learn, OpenCV, GPT-3 API, Unsupervised Deep Learning
General: C++, Java, Git, SQL, MATLAB
Amazon Web Services: Compute (EC2, Lambda), Storage (S3), Networking (VPC, ELB), Cloud (IAM, KMS, Amazon Polly)