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*

esumeItemRevised Bullet Points:

esumeItemImplemented auto-scaling on AWS Fargate; conducted stress-testing on API ensuring container replication and efficient resource allocation.

esumeItemBuilt a full-cycle pipeline for regular stress assessments, leveraging JMeter scripts and cloud execution through Blazemeter with Taurus.

esumeItemEnhanced GitLab CI/CD workflows for smooth test execution, ensuring zero interference with AWS infrastructures or concurrent development tasks.

esumeItemEarned accolades in two sprint reviews for setting benchmarks in extensive load testing.

esumeItemUtilized Apache Beam for data processing tasks.

- Constructed end-to-end pipeline for routine stress tests, utilizing JMeter for scripting and Blazemeter via Taurus for cloud execution.
- Customized GitLab CI/CD pipeline to execute tests seamlessly, guaranteeing no disruption to AWS resources or other development work
- Received formal recognition in two sprint retrospectives for establishing the baseline for comprehensive load tests.

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

- Contributed to the execution of 5 automated program repair tools for an empirical study on SLURM-based GPU clusters
- Reduced execution time by 16x by enabling parallel execution of tools on 40 GPU clusters
- Publication received a Distinguished Paper Award at the 38th IEEE/ACM International Conference on Automated Software Engineering

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

- Developed and optimized 12 ML models with 50 million records to predict monthly electricity use in Dubai, achieving 92.5% accuracy.
- Led a 6-person team in model analysis; achieved 10x faster training time using advanced algorithmic optimization techniques. [Paper]

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)