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*
- Deployed auto-scaling in AWS Fargate; stress-tested API to validate container duplication and optimized resource usage.
- 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

Machine Learning and Algorithms: Deep knowledge in TensorFlow, PyTorch, Scikit-learn, Keras, and Unsupervised Deep Learning. Practical experience building and adapting algorithms for various ML applications.
Programming: Proficiency in Python, Java, and C++. Familiarity with Swift and Objective C. Experience in crafting and prototyping interactive systems.
Mathematical Proficiency: Strong foundation in linear algebra and statistics, applied to real-world ML problems.
Cloud and Tools: Amazon Web Services, including Compute (EC2, Lambda) and Storage (S3). Familiar with Git, SQL, MATLAB, GPT-3 API, and OpenCV.
Research Excellence: Demonstrable record in Machine Learning research, with peer-reviewed publications showcasing expertise and innovative approaches.