Muhammad Arbab Arshad

848-313-9857 | arbab@iastate.edu | linkedin.com/in/arbab-arshad | arbab-ml.github.io

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

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

- Utilized Python and cutting-edge ML libraries to execute 5 automated program repair tools on SLURM-based GPU clusters.
- Optimized parallel execution on 40 GPU clusters, achieving a 16x reduction in execution time.
- Authored a publication that earned a *Distinguished Paper Award* at the 38th IEEE/ACM International Conference on Automated Software Engineering (URL).

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

- Led the development in Python of 12 ML models processing 50 million records to predict Dubai's monthly electricity use with a 92.5% accuracy rate.
- Directed a team of 6, employing advanced ML techniques to achieve 10x faster model training times (URL).

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

- Deployed auto-scaling in AWS Fargate with Python; validated container duplication via stress-testing to optimize resource use.
- Designed a comprehensive pipeline for routine stress tests, leveraging JMeter and Blazemeter via Taurus.
- Integrated a GitLab CI/CD pipeline to facilitate seamless test executions, ensuring zero disruptions.
- Earned *recognition in two sprint retrospectives* for setting a standard for in-depth load tests.

Projects

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

- Applied unsupervised ML techniques to transform image clustering algorithms for analyzing audio data, specifically bat echolocation behaviors.
- Employed ML frameworks including TensorFlow and PyTorch, achieving an impressive 88.28% accuracy in bat audio classification.

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

- Pioneered a text-to-audio generation system leveraging Generative Adversarial Networks (GANs) to convert poetry into corresponding melodies.
- Delivered generated melodies that were perceived to have a 68% similarity to authentic melodies, demonstrating the efficacy of the model.

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

- Incorporated Amazon Elastic Inference for real-time detection of SSH and FTP brute-force attacks in data traffic, streamlining ML model deployment.
- Reported an outstanding F1 score of 99% and realized an 8x speed increase when using Elastic Inference compared to conventional local inference methods.

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

- Crafted MeditateGPT, a unique application employing GPT-3 to offer tailored guided meditation sessions based on user-provided prompts.
- Integrated SSML with Amazon Polly's TTS API to produce natural-sounding audio, elevating the user experience.

Technical Skills

Languages: Python, Java, C++, R, SQL, MATLAB
Machine Learning & Computer Vision: TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, GPT-3 API, Unsupervised Deep Learning, CUDA
Cloud & Services: AWS (EC2, Lambda, S3, VPC, ELB, IAM, KMS, Amazon Polly), Git