**Education** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Ph.D. (Computer Science)** | **Iowa State University** | *Iowa, USA* | **01/2022 - 12/2025** |

• Relevant Courses: Advanced topics in Machine Learning, Advanced Design and Analysis of Algorithms, Cloud Computing.

|  |  |  |  |
| --- | --- | --- | --- |
| **M.S (Computer Engineering)** | **American University of Sharjah** | *Sharjah, UAE* | **08/2019 - 08/2021** |

• Relevant Courses: Generative Deep Learning, Big Data and Analytics, Advanced Multicore Computing.

|  |  |  |  |
| --- | --- | --- | --- |
| **B.S (Computer Science)** | **Lahore University of Management Sciences** | *Lahore, PK* | **08/2015 - 05/2019** |

**Relevant Experience** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Software Engineering Intern** | **Kingland** | *Iowa, USA* | **05/2022 - 08/2022** |

• 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** | **Laboratory for Software Design** | *Iowa, USA* | **05/2022 - 08/2022** |

• 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*](https://conf.researchr.org/details/ase-2023/ase-2023-papers/105/Mutation-based-Fault-Localization-of-Deep-Neural-Networks) at the 38th IEEE/ACM International Conference on Automated Software Engineering.

|  |  |  |  |
| --- | --- | --- | --- |
| **Machine Learning Engineer** | **OpenUAE** | *Sharjah, UAE* | **05/2020 - 12/2021** |

• 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*](https://www.sciencedirect.com/science/article/abs/pii/S1474034622001653)]

**Additional Experience** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Graduate Teaching Assistant** | **Iowa State University** | *Iowa, USA* | **01/2022 - Present** |

• Teaching Assistant for the course on Computer Architecture, leading a team of 4 TAs and managing the grading of 200 students.

**Projects** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
• **MeditateGPT** (*Technologies***:** 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** (*Technologies***:** 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** (*Technologies***:** 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** (*Technologies***:** 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.

**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)

**Honors & awards**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
• Fully funded Scholarship for Undergraduate Studies at LUMS (Acceptance Rate: 2.0%).

• Founded the IEEE Computer Society Student Chapter at LUMS University and also served as president of the IEEE LUMS Student Branch.