

Saadat Hasan Khan

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EDUCATION

Ph.D in Computer Science

George Mason University | 2022 - 2026

B.Sc. in Computer Science and Engineering

Brac University | 2015 - 2019

WORK EXPERIENCE

Machine Learning Engineer | Brilliant Corporation

June 2024 – August 2024 | Reston, VA

- Engineered pre-processor and source-finder services using Flask and Docker on AWS EC2, resulting in 3x time efficient data processing pipeline
- Developed custom document chunking models achieving 20% better context retention vs standard libraries; integrated with OpenSearch vector database for efficient storage and retrieval
- Integrated in-house custom designed microservices with BRAG (main application) gateway and Llama-3 8b model; optimized service payloads ensuring seamless cross-component communication
- Designed and executed ML component testing framework across 1,000 data entries, validating system performance with 82% retrieval accuracy

Graduate Research Assistant | George Mason University

August 2022 - Present | Fairfax, VA

- Health NLP and Information Extraction Research under Dr. Kevin Lybarger's supervision
- Research health NLP tasks focusing on information extraction and question answering with health data leveraging LLMs on frameworks like Fine-tuning, Reinforcement Learning with Human Feedback, Knowledge Distillation and Agent Simulation

SELECTED PUBLICATIONS

- Fardin Ahsan Sakib, AHM Karim, **Saadat Hasan Khan**, Md Mushfiqur Rahman. *Intent Detection and Slot Filling for Home Assistants: Dataset and Analysis for Bangla and Sylheti*. 2023. ACL Workshop on Bangla Language Processing
- Fardin Ahsan Sakib, **Saadat Hasan Khan**, AHM Karim. *Extending the frontier of chatgpt: Code generation and debugging*. 2024. International Conference on Electrical, Computer and Energy Technologies
- Saadat Hasan Khan***, M. G. R. Alam. *A Federated Learning Approach to Pneumonia Detection*. 2021. International Conference on Engineering and Emerging Technologies

SELECTED PROJECTS

Gentopia - Mason | GPT, OpenAI, Python

September 2024

- Designed LLM conversational agents for Gentopia-Mason efficiently conversing regarding any PDF in the internet without hallucinating with an accuracy of 98% on manual test cases

Pneumonia-as-a-service | Tensorflow, Flask, AWS, Kubernetes, Jenkins

March 2024

- Developed and deployed a scalable deep learning web service for Pneumonia detection from chest X-ray images using a fine-tuned VGG-16 mode with 91% F1 score. Implemented a Dockerized Flask API with a front-end interface, deployed on Kubernetes, and automated CI/CD with Jenkins

Polarization compatible Neural Rendering | Pytorch, Numpy, Colmap

June 2023

- Developed and implemented a neural rendering model using PyTorch to generate scenes with consistent polarization parameters successfully validated the model's output against ground truth data, very accurate AoLP and DoLP values

SKILLS

Languages: Python, SQL (Oracle & PostgreSQL), Java

Cloud Developer Tools: Git, GCP, Docker, AWS - SageMaker, S3, EC2, DynamoDB, IAM, Kubernetes, CI/CD, Jenkins, Snowflake

Machine Learning Libraries: Pandas, NumPy, Matplotlib, Pytorch, NLTK, spaCy, TensorFlow, Huggingface, scikit-learn