

# Zaber Ibn Abdul Hakim

+1 540 934 8424 | [zaberkhakim666@gmail.com](mailto:zaberkhakim666@gmail.com) | [LinkedIn](#) | [Website](#) | [Google Scholar](#) | [kaggle](#)

## EXPERIENCE

### Virginia Polytechnic Institute & State University

Aug 2024 — Current

#### Graduate Researcher

- Optimizing omni-modal (text-video-audio) event **information extraction** systems using multimodal LLM for multimedia documents to reduce the information gap between modalities.
- Uncovering security **vulnerabilities in LLMs** to enhance reliability for widespread deployment.
- Leveraging multimodal LLMs to propose a training-free, modular, and self-correcting **event graph based video question answering** framework.

### IQVIA

Jun 2023 — Jul 2024

#### Machine Learning Engineer

- Designed and implemented IQVIA's first [AI-Assistant](#), a chatbot powered by a **fine-tuned LLaMA** model, enhancing user experience and product engagement. The initial release secured a 4.2 million USD contract with Novartis.
- **Quantized LLaMA with AutoAWQ** which reducing response time by 54% and memory usage by 73%, and deployed to cloud data platform (AWS).
- Enhanced key components of IQVIA's Next-Best-Action products, a suite of **recommender machine learning algorithms** generating over 10 million USD in annual revenue. Also contributed to the deployment of these models on **Kubeflow**.
- Optimized and deployed a **spaCy entity extraction** model in a **Kubernetes** pod using **Docker**, enhancing the capacity by 150% and reducing response latency to 2ms.
- **Developed APIs** to collect large data from distributed cloud sources (e.g., Snowflake) and preprocessed them for seamless integration with ML models.
- **Developed proof-of-concept approaches** and transformed these into fully functional products through research and iterative refinement.
- Collaborated with stakeholders, clients, and product managers to refine project requirements, ensuring alignment with business goals and user needs. Also presented technical progress to non-technical stakeholders.
- **Created APIs** to facilitate communication between ML models and backend servers.
- Managed the machine learning lifecycle, including sprint planning, code design, reviews, CI/CD, and project delivery.
- Python, PyTorch, Scikit-Learn, Kubeflow, Snowflake, FastAPI, Kubernetes(k8s), Docker, AWS, Amazon SageMaker

### Xu Lab; Carnegie Mellon University

Jan 2022 — Feb 2024

#### Research Intern

- Enhanced sentence component understanding for video moment retrieval by flexible hard negative mining, which boosted the mAP by 13.7%.
- Devised a human-engineered feature extraction method for anomalous event detection in automated laboratory experiments, improving AUC by 19% over the state-of-the-art approach.

## RESEARCH PUBLICATIONS

- **"SONICS: Synthetic Or Not-Identifying Counterfeit Songs"**, ([arXiv](#))  
*MA Rahman\**, *ZIA Hakim\**, *NH Sarker\**, *B Paul\**, *SA Fattah*  
International Conference on Learning Representations, ICLR 2025
- **"ENTER: Event Based Interpretable Reasoning for VideoQA"**,  
*H Ayyubi*, *J Liu*, *Z Wang*, *H Alomari*, *CW Tang*, *A Asgarov*, *MD Atabuzzaman*, *NH Sarker*, *ZIA Hakim*, *Shih-Fu Chang*, *Chris Thomas*  
**Spotlight Paper** at Multimodal Algorithmic Reasoning Workshop at **NeurIPS 2024** | Under Review at **CVPR 2025**
- **"Leveraging Generative Language Models for Weakly Supervised Sentence Component Analysis in Video-Language Joint Learning"**, ([arXiv](#))  
*ZIA Hakim\**, *NH Sarker\**, *RP Singh*, *B Paul*, *A Dabouei*, *M Xu*  
7<sup>th</sup> Multimodal Learning and Applications Workshop at **CVPR 2024**
- **"ArtiFact: A Large-Scale Dataset with Artificial and Factual Images for Generalizable and Robust Synthetic Image Detection"**, ([arXiv](#))  
*MA Rahman\**, *B Paul\**, *NH Sarker\**, *ZIA Hakim\**, *SA Fattah*  
International Conference on Image Processing, **ICIP 2023**

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- "Exploring Attention Mechanisms in Integration of Multi-Modal Information for Sign Language Recognition and Translation", [\(paper link\)](#)  
*ZIA Hakim, RM Swargo, MA Adnan*  
International Conference on Image Processing, ICIP 2024
- "Detecting Anomalies from Liquid Transfer Videos in Automated Laboratory Setting", [\(paper link\)](#)  
*NH Sarker, ZIA Hakim, A Dabouei, MR Uddin, Z Freyberg, A MacWilliams, J Kangas, M Xu*  
Frontiers in Molecular Biosciences

## EDUCATION

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- **Master's of Science in Computer Science** Aug 2024 — May 2026  
*Virginia Polytechnic Institute & State University*  
CGPA : 4.00 (out of 4.00)
- **Bachelor of Science in Computer Science and Engineering** Mar 2018 — May 2023  
*Bangladesh University of Engineering and Technology*  
CGPA : 3.83 (out of 4.00) | *Enlisted for Deans List Award*

## AWARDS

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- **Best Student Team, 4<sup>th</sup> Place, Kaggle Gold Medal** , [SIIM-FISABIO-RSNA COVID-19 Detection](#) Aug 2021
- **Joint Winner** , [Kaggle Days x Z by HP World Championship 2022, Shanghai](#) Sept 2022
- **Winner** , [Deep Chimpact](#) Nov 2021
- **Winner** , [IEEE Signal Processing Cup](#) May 2022
- **First Runner-up** , [IEEE Video & Image Processing Cup](#) Sept 2022

## SOFTWARE PROJECTS

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- **How Are You**  
Developed a mental health screening site that offers clinically proven online assessments and connects users with psychiatrists if needed.  
Flask, ReactJS and PostgreSQL
- **BUET Alumni Portal**  
Created a portal for alumni to communicate, share news, and exchange thoughts.  
Django, HTML, CSS, JavaScript and PostgreSQL