MD ASHIKUR RAHMAN

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EDUCATION

American International University-Bangladesh — Jan.'11 – Feb.'15
B.Sc. in Computer Science and Engineering
CGPA: 3.87 Out of 4.00 (Class Ranking: Among Top 3%)
Thesis: Sentiment Analysis and Fact Extraction from RSS Feeds: An In-depth Analysis — Advisor: Prof. Dr. Tabin Hasan

RESEARCH INTERESTS

- Machine Learning and Optimization
- Neural Networks
- Computer Vision
- Natural Language Processing

RESEARCH PROJECT HIGHLIGHTS

✓ **Enhancing Mesh Generation through Multi-View Image Fusion**
Contributors: *Md Ashikur Rahman*, Md Arifur Rahman, Faizul Hassan, Shafayat Ahmed — Apr.'23 – Present

To overcome the drawbacks of reconstructing objects from a single viewpoint, this research project studies the combination of images from various angles to generate more precise and intricate 3D meshes. Utilizing data from different viewpoints, the proposed method theoretically improves the quality of the resultant models. Currently, we are implementing multi-view image fusion techniques using Python to validate the theoretical accuracy of the reconstructions.

✓ **Deep Network Architectures for Object Detection and Segmentation** (National ICT Award Winning Project)
Contributors: *Md Ashikur Rahman*, Md Arifur Rahman, Nazmin Nahar, Zakir Hossain — Apr.'21 – Present
Project Link: https://retouched.ai/

In this project, we have designed a deep neural network for salient object detection, which has resulted in a novel solution for "Image Background Removal." The solution achieves a high accuracy of 96.23% using the Human Correction Efforts (HCE) metric at its best and maintains a commendable accuracy of 81.47% even in worst-case scenarios a for a wide range of products. Our contributions can be summarized as follows:

- Firstly, the model captures vast amount of contextual information for precise and accurate salient object extraction.
- Secondly, the model achieves increased depth through advanced pooling operations in RSU blocks, enhancing system performance with high accuracy. Specifically, the processing time for an image with a size of 257 MB is reduced to 2.27 seconds, excluding image uploading, when executed on NVIDIA A100 40GB on GCP.

✓ **Revolutionizing Contextual Key Phrase Spotting and Insights Extraction from Audio Conversations**
Contributors: *Md Ashikur Rahman*, Kazi Sohrab Uddin, Md Nahiyan, Mahmuda Akter — Sept.'23 – Nov.'23

This project utilizes SeamlessM4T, a multimodal AI model designed for translating speech and text, and leverages the capabilities of Llama 2 to identify and extract key contextual phrases. In Bangladesh, this system has been deployed within a telecommunications company to enhance and streamline their operational processes.

✓ **Named Entity Recognition (NER) on the N2C2 Dataset: Obesity Challenge Factors** (Voluntary Research Project)
Contributors*: Md Ashikur Rahman*, Thanh Thieu — Jul.'20 – Sep.'20

Enhanced Named Entity Recognition (NER) task performance by implementing Tree-LSTM over traditional LSTM. Retrained the neural network and shared the research on GitHub for peer review. The following highlights our primary contributions to this research: [The detailed work is accessible on GitHub for team members to review].

- Improved architecture with Tree-LSTM, achieving a 7.23% performance increase over prior methods.
- Developed an algorithm that efficiently converts NeuroNER output to WebAnno input format.

- ✓ **Exploring Collaborative Learning for Generalized Virtual Try-On with GP-VTON**
  Contributors: Md Arifur Rahman, Zakir Hossain, *Md Ashikur Rahman* Jan.'23 – Present

  This research project aims to improve the accuracy of the GP-VTON framework for Image-based Virtual Try-On technology. This involves developing a new warping module and training strategy to enhance its performance.

PUBLICATIONS & WORKSHOPS - (Google Scholar)

- (Under Review) *Md Ashikur Rahman*, Md Arifur Rahman, Juena Ahmed Noshin. "AdvHSNet: An Approach Using Self-Attention Mechanism for Hate Speech Detection." Submitted to IEEE Transactions on Artificial Intelligence, a Q1-ranked journal in Artificial Intelligence, November 2023.
- *Md Ashikur Rahman*, Md Arifur Rahman and Juena Ahmed Noshin. Automated Detection of Diabetic Retinopathy using Deep Residual Learning. International Journal of Computer Applications 177(42):25-32, March 2020.
- NVIDIA GTC - Accelerating Data Engineering Pipelines – Nov 2021 (INSTRUCTOR-LED WORKSHOP)

EMPLOYMENT

- ✓ **The KOW Company**
  Lead, Artificial Intelligence (Image Processing Lab) Jan.'23 – Present
  Key Contributions:
  - Conducting research on DL/CV techniques, including 3D reconstruction, object detection, image segmentation.
  - Collaborating closely with teammates to find optimal solutions and address challenges.
  - Managing end-to-end AI projects, ensuring timely completion and delivering efficient results.

  Machine Learning Engineer (Image Processing Lab) Jul.'20 – Dec.'22
  Key Contributions:
  - Implemented deep learning models, resulting in significant improvements in object recognition and segmentation tasks.
  - Conducted A/B testing to assess the performance and effectiveness of different model variations or algorithms.

- ✓ **Smart Technologies (BD) Ltd**
  Sr. Software Engineer Sep.'16 – Dec.'19
  Key Contributions:
  - Designed a scalable Microservices architecture for a 19-module ERP system.
  - Developed a Real-Time Large Scale Data Synchronization Scheduler utilizing ASP.NET MVC 4 and SSMS.

- ✓ **Proggasoft**
  Software Engineer Mar.'15 – Aug.'16
  Key Contributions:
  - Developed a Contest Platform for Programmers - https://devskill.com/

TECHNICAL SKILLS

Machine Learning	Supervised and Unsupervised Learning, Linear Models.
Familiar ML Techniques	Lasso/Ridge Regression, Random Forest, PCA, NB, KNN, SVM, Gradient Decent, etc.
Computer Vision/NLP	Transformer, U2-Net, Mask R-CNN, etc.
Programming/Database	C/C++, Python; Databases (MySQL, MS SQL Server).
Cloud Platform & GPUs	Local: NVIDIA GeForce RTX 4090, GCP: NVIDIA A100 GPUs (80GB/40GB).
Software & Tools	LaTeX, PyCharm, Google Colab; NVIDIA DALI.
Python & ML Framework	FastAPI, PyTorch, TensorFlow, Matplotlib, etc.
Version Control	GitHub, Bitbucket.

AWARDS AND SCHOLARSHIPS

- 2021: APICTA 2021 - The Asia Pacific ICT Alliance Award-2021 (FINALIST)
- 2021: Basis National ICT Awards-2020 (CHAMPION)
- 2015: Academic Award (Magna Cum Laude)
- 2012-2014: Merit Scholarship & Tuition Fee Waiver , AIUB

ONLINE COURSES & CERTIFICATION [Available for public viewing via the provided link]

- Problem Solving (Advanced) – GOLD Badge Level on HackerRank, ranking among the top 1% globally
- Problem Solving (Basic) – Completed comprehensive training on HackerRank
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning – Coursera