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: Analysis of Sentiment and Extraction of Facts from RSS Feeds — Advisor: Prof. Dr. Tabin Hasan

RESEARCH PROJECT HIGHLIGHTS

✓ **Deep Network Architectures for Object Detection and Segmentation** (National ICT Award Winning Project)
Contributors: Md Ashikur Rahman (Tech Lead), Md Arifur Rahman, Nazmin Nahar — Apr.'21 – Present

Our team has meticulously designed a robust and formidable deep network architecture for salient object detection, culminating in an efficient "Image Background Removal" solution. This cutting-edge technology has revolutionized image processing, professionally reducing the manual workload by a staggering 85.23% for an astonishing at least 21,000 images per day. Our team's invaluable contributions can be summarized as follows:

- Firstly, our system excels at capturing vast amounts of contextual information, which we use to generate intricate image masks from raw images. This enables us to extract salient objects with unprecedented precision and accuracy.
- Secondly, our architecture increases depth, bolstered by advanced pooling operations in our RSU blocks. This heightened depth significantly enhances the system's performance, without imposing a heavy computational burden.
- Our system stands out from the competition with its exceptional ability to handle even the most massive image files with ease. To date, it can seamlessly process images up to an astounding 257 MB in size.

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

The basis of NeuroNER is a variant of recurrent neural network (RNN) called long short-term memory (LSTM). Nonetheless, we have substituted LSTM with Tree-LSTM and retrained the neural network from scratch to conduct NER on the dataset. Our primary contributions to this study are outlined below: [Available on GitHub for teammates to view]

- A significant change has been made to the architecture by incorporating Tree-LSTM, resulting in a 7% enhancement compared to the previous method.
- We have contributed to developing an algorithm that converts NeuroNER output to WebAnno input format.

✓ **A Novel Approach for Amalgamating curves with Edges to Modify Image Dimensions**
Contributors: Md Arifur Rahman(Tech Lead), Md Ashikur Rahman — Nov.'20 – Jan.'21

We have developed a novel algorithm for this project, with an accuracy rate of approximately 99.37%. The algorithm seamlessly connects all the points along the edge, while automatically resizing the images. This groundbreaking algorithm offers the following advantages. [Available on GitHub for public view]

- It removes the unwanted objects, keeps the salient objects in the images.
- Additionally, the algorithm margins objects and resizes images with ease, simplifying the process for users.

PUBLICATIONS & WORKSHOPS - (Google Scholar)

1. **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.
2. NVIDIA GTC - Accelerating Data Engineering Pipelines – Nov 2021 (INSTRUCTOR-LED WORKSHOP)

Emerging Ideas: A Showcase of Work-in-Progress Research

1. As authors, soon we intend to submit a manuscript titled "Nested U-Structure like Pure Transformer for Medical Image Segmentation" to a renowned journal. The proposed approach involves utilizing a nested U-structure similar to a pure transformer for medical image segmentation. Our research presents promising results in the field of medical image analysis and has the potential to contribute significantly to the advancement of medical image segmentation techniques.

EMPLOYMENT

- ✓ **The KOW Company**

Lead, Artificial Intelligence (Image Processing Lab) Jan.'23 – Present
Contributions Include:

- Exploring new AI applications, and identifying opportunities for continuous improvement through research.
- Working together with teammates to find the most efficient and effective solutions.
- Managing AI projects, developing AI strategies, and collaborating with Business Units.

Machine Learning Engineer (Image Processing Lab) Jul.'20 – Dec.'22
Contributions Included:

- Assessing research constraints, obstacles, and viability during the development of neural architectures.
- Designing Deep Network Architectures for Object Detection and Segmentation.
- Producing optimized and well-organized code while adhering to design principles.

- ✓ **Smart Technologies (BD) Ltd**

Sr. Software Engineer Sep.'15 – Dec.'19
Contributions Included:

- Designing Microservices architecture for large scale ERP for about 19 modules
- Developing Real Time Large Scale Data Synchronization Scheduler using ASP.NET MVC 4 & SSMS

- ✓ **Proggasoft**

Software Engineer Aug.'14 – Aug.'15
Contributions Included:

- Debugging and troubleshooting for solving technical issues
- Developing a Contest Platform for Programmers - https://devskill.com/

RESEARCH INTERESTS

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

TECHNICAL SKILLS

Machine Learning	Supervised and Unsupervised Learning, Linear Models etc.
Familiar ML Techniques	Regression, Decision Tree, Naive Bayes, KNN, SVM, Random Forest, Gradient Decent.
Computer Vision	Deep Network Architecture: - U2-Net, Mask R-CNN etc.
Programming/Analytics	Python and C/C++; Database: - (MySQL, MS SQL Server)
Cloud Platform & GPUs	Google Cloud Platform; GPUs: NVIDIA Tesla A100 & NVIDIA Tesla V100
Software & Tools	LaTeX, PyCharm, Google Colab; NVIDIA DALI, ASGI Framework (Starlette)
ML Framework	PyTorch, TensorFlow, Keras
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

- Problem Solving (Advanced) – [HackerRank: Badge Level: 6 STAR - GOLD (World Ranking: Among Top 1%)]
- Problem Solving (Basic) – HackerRank
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning – Coursera
- Neural Networks and Convolutional Neural Networks Essential Training - LinkedIn