Md Ashikur Rahman

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EDUCATION

American International University-Bangladesh
B.Sc. in Computer Science and Engineering
CGPA: 3.87 Out of 4.00 (Ranking: Among Top 2%)
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)
Contributor**:** *Md Ashikur Rahman (TL)*, Md Arifur Rahman, Nazmin Nahar

In this project, we have developed simple yet powerful deep network architecture for salient object detection (SOD), and utilized the architecture in order to improve the efficiency of the "Image Background Removal" & "Ghost Mannequin". This reduces the workload of manual image processing **by about 64% as of today.** The architecture has the following advantages: [GitHub-Private]

- It captures more contextual information while generating image masking from raw images
- It increases the depth of the whole architecture without significantly increasing the computational cost because of the pooling operations used in these RSU blocks.
- It handles larger image files than remove.bg So far it can process up to 157 MB for each image where remove.bg processes up to 25 MB (Reference: https://www.remove.bg/api#rate-limit)

✓ **Named Entity Recognition (NER) on the N2C2 Dataset: Obesity Challenge Factors** (Voluntary Research Project)
Contributor: *Md Ashikur Rahman*, Thanh Thieu (Assistant Professor, CSE; Oklahoma State University)

NeuroNER leverages the state-of-the-art prediction capabilities of deep learning and enables the users to create or modify annotations for a new or existing corpus. The NeuroNER engine is based on artificial neural networks (ANNs). Specifically, it relies on a variant of recurrent neural network (RNN) called long short-term memory (LSTM). The NER engine's ANN contains three layers [GitHub-Public]

- Character-enhanced token-embedding layer
- Label prediction layer
- Label sequence optimization layer

On the N2C2 Dataset (Public) (Obesity Challenge Factors), we have trained the neural network that performs the NER on the dataset **(with approximately 7% improvements over previous approaches)** and evaluated the quality of the predictions made by NeuroNER. Also, we have developed an algorithm that converts NeuroNER output to WebAnno input format. However, the performance metrics can be calculated and plotted by comparing the predicted labels with the gold labels. The evaluation can be done at the same time as the training if the test set is provided along with the training and validation sets, or separately after the training.

✓ **Automatic Image Resizing from Masking Based on U2-Net Architecture**
Contributor**:** Md Arifur Rahman(TL), *Md Ashikur Rahman*

- It removes unwanted objects, leaving desired objects in the image
- It automatically margins objects and resizes the images.

In this project, we have created a simple yet powerful algorithm **(accuracy: ~ 99.15%)** that can join all the curves of all the uninterrupted points on the edge and use the U2-Net architecture to automatically resize the image from image masking. The algorithm has the following advantages: [GitHub-Private]

PUBLICATIONS & WORKSHOPS

Journal Paper(s)

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)*

EMPLOYMENT

- ✓ **CutOutWiz Ltd., Bangladesh**
  Machine Learning Engineer July'20 – Present
  Contributions:
  - Working on Deep Network Architectures for Object Detection and Segmentation
  - To look for unanswered questions, insights, and research limitations & impediments when developing neural architecture
  - Developing the training & validation procedure to increase the model efficiency
  - To write optimized & clean codes maintaining design principles using Python

- ✓ Smart Technologies (BD) Ltd
  Sr. Software Engineer Sept.'16 – Dec.'19
  Contributions:
  - Designed Microservices Architecture for Supply-Chain Management
  - Developed the Supply-Chain Management from scratch using .Net Core
  - Developed Real Time Large Scale Data Synchronization Scheduler using ASP.NET MVC 4 & SSMS

- ✓ Proggasoft
  Software Engineer Mar.'15 – Aug.'16
  Contributions:
  - Developed, Debugged and troubleshot for solving technical issues
    - Developed Contest Platform for Programmers - https://devskill.com/

INTERESTS

Machine Learning and Optimization
Neural Networks
Computer Vision
Natural Language Processing

TECHNICAL SKILLS

Machine Learning	Supervised and Unsupervised Learning, Linear Models
Familiar ML Techniques	Regression, Decision Tree, Naive Bayes, KNN, SVM, Random Forest, Gradient Decent.
Computer Vision	Deep Network Architecture: - U2-Net, Mask R-CNN
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	PyCharm, Google Colab; NVIDIA DALI (Level: Basic), ASGI Framework: Starlette
ML Framework	PyTorch, TensorFlow, Keras
Version Control	GitHub, Bitbucket

AWARDS AND SCHOLARSHIPS

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

ONLINE COURSES & CERTIFICATION

- Problem Solving (Advanced) – HackerRank
- 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

PROBLEM SOLVING & COMPETITIVE PROGRAMMING

- HackerRank: Badge Level: 6 STAR - GOLD (World Ranking: Among Top 1%)
- LeetCode: Status- Beginner
- Kaggle: Took Part in a Few Competitions (Status:- Learner/Novice)