

Amzad Hossain Rafi

Machine Learning Engineer

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A motivated and results-driven machine learning engineer with 2 years of hands-on experience in developing and implementing cutting-edge computer vision models. Adept at image processing, maintaining accurate training pipelines and proficiency in version control using Git, Keras, and PyTorch Lightning. Proven expertise in classification, segmentation, image resolution improvement, and denoising encoder, including proficiency in benchmarking and evaluating them to achieve optimal results. A constant learner who is eager to stay up-to-date with the latest advancements in the field and to take on new challenges.

Work Experience (2 years)

Canada Syntax

Albarta, Canada

Machine Learning Engineer (remote)

Apr 2020 - Jun 2022

- Developed a model that can do a time series analysis of land deformation from InSAR satellite image and predict affected areas that may suffer the deformation in future.
- Semantic Segmentation of areal InSAR satellite images to find out the flood-affected sites and developed modified unet model structure to improve its Segmentation **mean IOU +20%**.
- Optimized space complexity up to **22%** of training by implementing Jit compiler and mixed precision
- key ideas: Image Classification, Semantic segmentation, GAN, Transfer Learning.**
- Technical Skills: Python, Numpy, keras, PyTorch Lightning, Git, Matplotlib, Rest-API, LaTeX.**
- Soft Skills: Teamwork, Time Management, Communication, Presentation skills, Data pre-processing.**

Education

North South University

Dhaka, Bangladesh

B.Sc in Computer Science & Engineering

Sep 2016 - Feb 2021

- CGPA : 2.94/4
- achieved best final year project

Projects

Personal Protective Gear Detection Surveillance System

Dhaka, Bangladesh

North South University

Oct 2021 - Dec 2021

- Surveillance system that track people are the wear mask, face-shield hand gloves and ppe
- Live object tracking is achieved by Deep Sort's object tracking algorithm.
- Track and capture a snap if anyone don't have a mask
- Achieved more than **80% tracking accuracy** with deep sort and achieved **avg accuracy of 68%**
- Key ideas:** Object detection, Object tracking
- Technical Skills:** Darknet, keras, Numpy, OpenCV
- Soft Skills:** Report writing, Logical Thinking, collaboration.

Semantic Segmentation of areal SAR satellite images to find out the flood affected site

Dhaka, Bangladesh

Canada Syntax

Oct 2020 - Dec 2021

- Pixel wise classification of areal SAR satellite images to find out the flood-affected site.
- Developed modified Unet model structure to improved its Segmentation mean **IOU +20%**.
- Deployed the model believe this project **will save millions of life in near future.**
- Key ideas:** Semantic Segmentation, Image classification
- Technical Skills:** Semantic Segmentation, Python, Numpy, keras, PyTorch Lightning, Git, Matplotlib.
- Soft Skills:** Report writing, Presentation skills, Collaboration, Critical Thinking.

Video Next-Frames Prediction

Dhaka, Bangladesh

Oct 2021 - Dec 2021

- Time series analysis from video using adaptable LSTM and RNN.
- Sequence analysis of images and predict the next position of the object **dice score 70.**
- Technical Skills:** Use of LSTM and RNN layers, keras, numpy, matplotlib.
- Soft Skills:** Report writing, Logical Thinking, Critical Thinking.

Skills

Programming/Framework

Python, Pandas, SciKit-Learn, TensorFlow, NumPy, Matplotlib, Keras, OpenCV, PIL, Flask, HTML, CSS, C

Miscellaneous

Linux, \LaTeX (Overleaf/Markdown), Microsoft Office, Git, CI/CD(Github Action).

Soft Skills

Time Management, Teamwork, Presentation, Collaboration, Multitask, Problems-solving, Self-motivated.

Publication (Total citations 12)

- ▶▶ A. A. Protik, H. Rafi and S. Siddique,, "Real-time Personal Protective Equipment (PPE) Detection Using YOLOv4 and TensorFlow," 2021 IEEE Region 10 Symposium (TENSYP), 2021, pp. 1-6, doi: 10.1109/TENSYP52854.2021.9550808. <https://ieeexplore.ieee.org/document/9550808>
- ▶▶ Haque, M. et al. (2021). **Data Mining Techniques to Categorize Single Paragraph-Formed Self-narrated Stories.** engineering benchmark, Deep learning In audio: Fong, S., Dey, N., Joshi, A. (eds) ICT Analysis and Applications. Lecture Notes in Networks and Systems, vol 154. **Springer, Singapore.** https://doi.org/10.1007/978-981-15-8354-4_70

Languages

Bengali	native proficiency
English	Professional proficiency
Hindi	natural proficiency

Certification

Neural Networks and Deep Learning	Deeplearning.AI
Convolutional Neural Networks	Deeplearning.AI
Basics of Artificial Intelligence	10 minute school
Improving Deep Neural Networks: Hyperparameter Tuning	Deeplearning.AI
Mathematics	365 data science
SQL	Hackerrank