Najibul Haque Sarker

ML Engineer & Researcher
[Google Scholar] [Website] [Github] [Kaggle] [LinkedIn]
Research Areas: *Computer Vision, Video-Language Joint Tasks, Multi-Modal, LLM*

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Affiliation

Machine Learning Engineer June 2023 - Present
- IQVIA
  Next Best Action ML Team

Research Intern Jan 2022 - Present
- Xu Lab, Carnegie Mellon University
  Video Anomaly Detection and Deep Video Analysis Projects

Bachelor of Computer Science and Engineering April 2018 - May 2023
- Bangladesh University of Engineering and Technology *CGPA: 3.95 (out of 4)*
  Enlisted in Dean's List Merit Award

Publications

Leveraging Generative Language Models For Weakly Supervised Sentence Component Analysis In Video-Language Joint Learning
- Zaber Ibn Abdul Hakim*, **Najibul Haque Sarker***, Rahul Pratap Singh, Bishmoy Paul, Ali Dabouei, Min Xu
  Keywords: Computer Vision, Vision-Language, Multi Modality
  Under review at CVPR 2024, Preprint

Forward Diffusion Guided Reconstruction As A Multi-Modal Multi-Task Learning Scheme
- **NH Sarker**, MS Rahman
  Keywords: Computer Vision, Medical Imaging, Diffusion
  Accepted for oral presentation at ICIP 2023, Preprint

ArtiFact: A Large-Scale Dataset With Artificial And Factual Images For Generalizable And Robust Synthetic Image Detection
- M. A. Rahman*, B. Paul*, **N. H. Sarker***, Z. I. A. Hakim* and S. A. Fattah
  Keywords: Computer Vision, Image Generation, Synthetic Image Detection
  Accepted at ICIP 2023, Preprint

Syn-Att: Synthetic Speech Attribution Via Semi-Supervised Unknown Multi-Class Ensemble Of CNNs
- M. A. Rahman*, B. Paul*, **N. H. Sarker***, Z. I. A. Hakim* and S. A. Fattah
  Keywords: Signal Processing, Synthetic Speech Attribution
  Under review at ICASSP 2024, Preprint

Detecting Anomalies From Liquid Transfer Videos In Automated Laboratory Setting
- **NH Sarker**, ZA Hakim, A Dabouei, MR Uddin, Z Freyberg, A MacWilliams, J Kangas, M Xu
  Keywords: Computer Vision,Video Anomaly Detection, Object Tracking
  Accepted at Frontiers in Molecular Biosciences

*Equal Contribution

Competition Experience

Signal Processing CUP 2022 May 2022
- Synthetic Speech Attribution *IEEE SPS*
  Winner

Video and Image Processing Cup 2022 October 2022
- Synthetic Image Detection *IEEE SPS*
  1st Runner Up

Kaggle Days World Championship Nov 2021
- Keypoint detection *Kaggle*
  Joint Winner *of Shanghai Meetup*

Deep Chimpact: Depth Estimation for Wildlife Conservation Nov 2021
- Depth Estimation *DrivenData*
  1st *Place out of* ***313*** *teams*

SIIM-FISABIO-RSNA COVID-19 Detection Aug 2021
- Identify and localize COVID-19 abnormalities on chest radiographs *Kaggle*
  4th *place out of* ***1,305*** *teams (Gold Medal),* ***1st*** *Student team*

BirdCLEF 2021 - Birdcall Identification June 2021
- Acoustic identification of birds in soundscape recordings *Kaggle*
  29th *place out of* ***816*** *teams (Silver Medal)*

VinBigData Chest X-ray Abnormalities Detection March 2021
- Localize and classify thoracic abnormalities from chest radiographs *Kaggle*
  43rd *place out of* ***1,275*** *teams (Silver Medal)*

NFL 1st and Future - Impact Detection Jan 2021
- Detect helmet impacts from videos *Kaggle*
  25th *place out of* ***459*** *teams (Silver Medal)*

DhakaAI - Dhaka Traffic Detection Challenge Dec 2020
- Vehicle Detection from the perspective of Bangladesh *DhakaAI*
  Winner

Video and Image Processing Cup 2020 Oct 2020
- Real-time vehicle detection and tracking at junction using a fisheye camera *IEEE SPS*
  1st Runner Up

Global Wheat Detection Aug 2020
- Detect wheat heads from images *Kaggle*
  62nd *place out of* ***2,245*** *teams (Silver Medal)*

BUET CSE Fest Hackathon 2019 - Cloud Computing Category April 2019
- Use Cloud APIs to build chatbot and integrate speech recognition and emotion identification *Github*
  1st Runner Up

Current Kaggle Rank: **Competitions Master**. Other competition results can be viewed here.

Academic Course Projects

- **CNN from scratch** Level 4 Term 2
  Deep Learning Framework *Github*
  Convolutional Neural Network model created with fully vectorized blocks using only **numpy**. Additional testing with **pytest** and logging with **wandb**.

- **Forage** Level 4 Term 1
  Software Development *Github*
  Tool for researchers to streamline the research pipeline: literature review writing paper as a group, publishing, conference management and paper review. Includes a website and a browser extension. Frontend: **React JS**, Backend: **Django** & **PostgresDB**.

- **Notabene** Level 3 Term 2
  Information System Design *Resources*
  Designing an in-browser note taking and highlighting web application. Inlcudes BPMN, UI, Class & ERD, Collaboration and Sequence Diagrams.

- **TCP-Adaptive Reno** Level 3 Term 2
  Computer Networking *Github*
  Simulation and implementation of a congestion control algorithm using **NS3** - a network simulator

- **Xv6** Level 3 Term 2
  Operating Systems *Github*
  Implement Scheduling and Memory management of an OS (**Xv6**)

- **Compiler from scratch** Level 3 Term 1
  Compiler *Github*
  A compiler is made from scratch using **yacc** and **bison**

Other projects can be viewed here.

Leadership

- Program Committee Chair for IEEE Computer Society BUET Student Branch Chapter (2022-2023). [link]
- Hosted a Deep Learning Competition on Kaggle for BUET CSE Fest 2022. [link]
- Received the Kaggle Community Competition Creator Prize (July Month). [winner announcement]
- Speaker at a Intro to Deep Learning workshop organized by IEEE Computer Society BUET.[event link]

Technical Skills

- **Languages**: Python, C++, JavaScript, Java, C#, SQL, Bash, CSS, Latex
- **ML Frameworks**: Pytorch, Tensorflow, Keras, Sklearn
- **Tools**: AWS Sagemaker, Git, Wandb, React, Bootstrap, Django, Oracle, PostgreSQL

Notable Academic Courses

Machine Learning, Artificial Intelligence, Simulation and Modelling, Bioinformatics, High Performance Database Systems, Operating Systems, Computer Security, Computer Networking, Computer Graphics, Compiler Design, Software Developement, Microprocessors and Microcontrollers, Information System Design, Object Oriented Programming

Certifications

Deep Learning Specialization by Andrew NG, Fundamentals of Scalable Data Science, AI for Medical Prognosis, AI for Medical Diagnosis