Alif Ashrafee

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Education

PhD **Rochester Institute of Technology**, Imaging Science — Rochester, NY, USA, Aug 2023 – present
- CGPA: 3.94/4.00
- Supervisor: Dr. Bartosz Krawczyk
- Member: Machine Learning and Computer Vision (MLVision) Lab
- Research focus: Computer Vision, Continual Learning

BSc **Islamic University of Technology**, Computer Science — Dhaka, Bangladesh, Jan 2018 – May 2022
- CGPA: 3.85/4.0
- Machine Learning Instructor and Executive Secretary: IUT Computer Society
- Anchor and Student Representative: IUT CS Department

Publications and Research Projects

Physics-informed Deep Learning for Continual Blind Lens Aberration Correction — Ongoing
Alif Ashrafee, Akib M. Khan, Bartosz Krawczyk, Grover Swartzlander

Balancing Adapters for Imbalanced Learning: Meta-Learned Adapter Tuning for Long-Tailed Class-Incremental Learning — Ongoing
Alif Ashrafee, Ting Cao, Jan Wasilewski, Bartosz Krawczyk

A Framework for Concept-Drift Adaptive Memory Realignment in Continual Learning — Under Review at TMLR
Alif Ashrafee, Jedrzej Kozal, Bartosz Krawczyk

AttResDU-Net: Medical Image Segmentation Using Attention-based Residual DU-Net — June 2023
Alif Ashrafee, Akib M. Khan, Fahim S. Khan, Md. Bakhtiar Hasan, Md. Hasanul Kabir
10.1109/IJCNN54540.2023.10191528 (IJCNN 2023)

Real-time Bangla License Plate Recognition for Low Resource Video Applications — Jan 2022
Alif Ashrafee, Akib M. Khan, Mohammad Sabik Irbaz
10.1109/WACVW54805.2022.00054 (WACV Workshops 2022)

Rethinking Cooking State Recognition with Vision Transformers — Dec 2022
Alif Ashrafee, Akib M. Khan, Reeshoon Sayera, Shahriar Ivan, Sabbir Ahmed
10.1109/ICCIT57492.2022.10055869 (ICCIT 2022)

Work Experience

Rochester Institute of Technology, Research Assistant — Rochester, NY, USA, May 2024 – present
- Supervisor: Dr. Bartosz Krawczyk, MLVision Lab, Center for Imaging Science
- Research Domain: Continual Learning, Data Streams, Concept Drift

Rochester Institute of Technology, Teaching Assistant — Rochester, NY, USA, Aug 2023 – May 2024
- IMGS-389: Machine Learning for Image Analysis
- IMGS-111: Imaging Science Fundamentals

RedDot Digital, Axiata Ltd., Software Engineer — Dhaka, Bangladesh, June 2022 – July 2023
- Star Performer and Project of the Year Awards, Q3 2022
- Worked on ERP and E-commerce platforms using React, Nextjs, and Redux
- Developed critical CRUD functionalities, dynamic API consumption mechanisms, Authentication, Data tables, Role-based access, and User Experience
- Built an automated employee attendance system using facial recognition with reverse embedding matching for identification

bKash Ltd., Cloud Engineering Consultant — Dhaka, Bangladesh, Oct 2021 – Mar 2022
- Developed expertise with Linux and scalable cloud-native environments

- Micro-service tools: Docker and Kubernetes
- AWS services: EC2, S3, ECR, DynamoDB, API Gateway, VPC, Route 53, etc.
- Infrastructure provisioning languages: Terraform and Ansible

Pioneer Alpha, Research Intern Jan 2021 – Aug 2021

- Curated a crowdsourced dataset of license plate images and videos
- Developed an end-to-end license plate recognition web application

Projects (selected)

License Plate Recognition Web Application

- Leveraged a Flask backend with a 2-stage detection module to detect and isolate plate images from video streams
- Used Google Vision API for extracting the license plate number and a MySQL database for storing them

Skin Lesion Segmentation using Conditional GANs

- Applied C-GANs with a Double U-Net generator and a patch-GAN critic network to segment skin lesions
- Achieved a DSC of 89.7% surpassing the state-of-the-art performance

Cat Learns to Jump Buildings

- Developed a reinforcement learning cat agent to learn to jump across buildings in a 2D environment
- Used Q-learning method to train the agent on past experience, rewards, and penalty policies

Image Enhancement and Registration

- Created a UI-based Matlab software for image enhancement using smoothing, Wiener, and deconvolution kernels
- Implemented FFT to visualize the frequency domain and homography transform for image registration

Construction and Raw Material Solutions

- Built a full-stack website using HTML, CSS, Bootstrap, JS, jQuery, and Django backend integrated with a database
- Developed a user authentication system, CRUD functionalities, dynamic search and filtering options

Skills

Programming Languages: C, C++, Python, Java, JavaScript

Machine Learning Frameworks: TensorFlow, Keras, PyTorch, OpenCV, Numpy, Pandas, Scikit-learn

Data Visualization: Matplotlib, Seaborn

Web Development: HTML, CSS, Bootstrap, Material UI, jQuery, React, Redux, Nextjs, Flask, Django, WordPress

Databases: MySQL, Oracle, PostgreSQL

Cloud and DevOps: AWS, Docker, Kubernetes, Terraform, Ansible, Git

UI/UX Design: Figma, Adobe XD, Canva, Photoshop

Extracurricular Activities

- Dhaka Ai Traffic Detection Challenge: Top 10 out of 100+ teams
- Climate Startup Launchpad: National round 2nd runner up out of 100+ teams

Certifications

- Stanford: Machine Learning
- Nvidia: Fundamentals of Deep Learning
- Coursera: Deep Learning Specialization
- Coursera: TensorFlow in Practice Specialization
- Coursera: Generative Adversarial Networks (GANs) Specialization