ALIF ASHRAFEE

Website | Email | LinkedIn | GitHub | Scholar

KEY COMPETENCIES

- Machine Learning: Linear & Logistic regression, SVM, PCA, Decision Trees, Clustering
- Computer Vision and Deep Learning: Classification, Recognition, Object Detection, CNN, GAN, ViT
- Web Development
- DevOps & Cloud Infrastructure

TECHNICAL SKILLS

- Programming Languages: C | C++| Java | JavaScript | Python
- Machine Learning libraries & frameworks: Numpy | Pandas | TensorFlow | Tensorboard | Keras | PyTorch | OpenCV | Matplotlib | Scikit-Learn | XGBoost | LightGBM
- Web development frameworks: WordPress | Material UI | jQuery | React | Redux | Flask | Django
- Databases: MySQL | Oracle | PostgreSQL
- Cloud & Deployment: AWS | Ansible | Terraform | Docker | Kubernetes | CI/CD

LEADERSHIP EXPERIENCE

- Machine Learning Instructor, IUT Computer Society
- Executive Secretary, IUTCS
- Host and student representative, CSE Department

HONORS AND AWARDS

- Star Performer and Project of the Year, Q3 2022, Red.Digital
- Dhaka Ai Traffic Detection Challenge: Top 10
- Climate Launchpad: National round 2nd runner up
- Climate KIC Bootcamp for startups certification
- BRAC Traction Business Pitch Competition: 5th position

EDUCATION

ROCHESTER INSTITUTE OF TECHNOLOGY
PhD in Imaging Science (CGPA: 3.90 out of 4.00) (2023 – Present)

ISLAMIC UNIVERSITY OF TECHNOLOGY
B.Sc. in Computer Science and Engineering (CGPA: 3.85 out of 4.00) (2018 - 2022)

PUBLICATION AND RESEARCH

MEDICAL IMAGE SEGMENTATION USING ATTENTION-BASED RESIDUAL DU-NET
Applied color constancy pre-processing algorithm for reducing augmentations, used attention gates and residual connections to retain more relevant spatial features. Achieved state-of-the-art results in 3 benchmark datasets (IJCNN 2023)

REAL-TIME BANGLA LICENSE PLATE RECOGNITION SYSTEM FOR LOW RESOURCE VIDEO-BASED APPLICATIONS
Contributed a benchmark Bangla license plate image and video dataset. Used a 2-stage detection module consisting of Cascade Classifier and MobileNet-SSD, and temporal frame separation strategy. Achieved real-time (27.2 FPS) detection performance on a single-threaded Intel Core-i5 CPU with only 8GB of RAM (WACV Workshops, 2022)

RETHINKING COOKING STATE RECOGNITION WITH VISION TRANSFORMERS
Conducted comparative analysis and ablation studies on pre-training and data-augmentation effects on several variants of the Vision Transformer on the Cooking State Recognition Dataset and obtained state-of-the-art 95% accuracy (ICCIT, 2022)

PROJECTS

LICENSE PLATE RECOGNITION WEB APP
Developed a web-app leveraging a flask backend to detect, isolate, and store license plates from video. Used Google Vision API for OCR and database for storing best results

SKIN LESION SEGMENTATION USING C-GAN
Applied Conditional GANs based on Image-to-Image translation with a DoubleU-Net as the generator and patchGAN as the critic to segment skin lesions. Achieved a DSC of 89.7% surpassing the DSC of standalone Double U-Net 89.62% with the help of a critic

CAT LEARNS TO JUMP BUILDINGS
Reinforcement learning technique to teach a cat agent to jump across buildings on its own based on past experience, rewards, and penalties using Q-Learning method

CONSTRUCTION & RAW MATERIALS SOLUTIONS
A full-stack website using HTML, CSS, Bootstrap, JS, jQuery, and Django backend integrated with Oracle DB. The website contained login & sign-up modules with validation along with dynamic search and filtering algorithms

WORK EXPERIENCE

- **GRADUATE RESEARCH ASSISTANT (PRESENT)**
  Research Assistant for Professor Bartosz Krawczyk at the Machine Learning and Computer Vision (MLVision) Lab at the Center for Imaging Science at RIT. My current research domain is continual and lifelong machine learning in data stream scenarios under the influence of concept drift.
- **GRADUATE TEACHING ASSISTANT (FALL 2023 – SPRING 2024)**
  IMGS-389: Machine Learning for Image Analysis
  IMGS-111: Imaging Science Fundamentals
- **SOFTWARE DEVELOPER | RED.DIGITAL, AXIATA LTD. (JUN 2022 – JUL 2023)**
- **CLOUD ENGINEERING CONSULTANT | BKASH LTD. (OCT 2021 – MAR 2022)**
- **RESEARCH INTERN | PIONEER ALPHA (JAN 2021 – AUG 2021)**