ABRAR TAHER

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EDUCATION

B.Sc. in Computer Science and Engineering
Chittagong University of Engineering & Technology 2018 - 2023
CGPA- 3.37/4.00
Last four semesters CGPA: 3.78/4.00

RESEARCH INTEREST

AI in healthcare, Explainable AI, Medical Image Processing, Computer Vision, Deep Learning, Machine Learning

RESEARCH EXPERIENCE

Thesis: A Deep Learning Approach for Multiclass Brain Tumor Classification and Segmentation
Supervisor: Ms. Sabiha Anan, Assistant Professor, Department of Computer Science and Engineering

- Developed a custom Convolutional Neural Network for multiclass brain tumor classification and a Residual Attention U-Net architecture for precise tumor segmentation.
- Conducted performance benchmarking against pretrained models while gaining hands-on experience with T1-weighted MR image preprocessing, feature extraction for small-scale tumors.

Ongoing Work:

Early Detection of Diabetic Retinopathy using Novel Pre-Processing of Retinal Fundus Images

- Developing a binary classification framework for Diabetic Retinopathy (DR) by combining fundus image enhancement with an attention-based transfer learning architecture.
- Implementing an extensive preprocessing pipeline—including auto-cropping, dehazing, bilateral filtering, CLAHE contrast enhancement, Frangi vessel filtering, and morphological top-hat transformations to highlight retinal vessels and critical lesion patterns.
- Creating a three-channel composite image representation by merging vessel structures, fine vascular details, and refined lesion masks to provide richer feature inputs for the classifier.

Gamma-CLAHE Enhanced InceptionV3 for MRI-Based Detection of Alzheimer's and Parkinson's Disease

- Developing a deep learning framework using a transfer-learning–based InceptionV3 architecture for multiclass classification of Alzheimer's disease (AD), Parkinson's disease (PD), and healthy controls from brain MRI scans.
- Implementing a hybrid preprocessing pipeline (Gamma-Corrected CLAHE) to enhance local contrast, normalize intensity variations, and improve the visibility of subtle structural patterns in MRI images.
- Integrating explainable AI (Grad-CAM) to generate class-specific activation maps, supporting interpretability and helping identify MRI regions most influential in model predictions.
- Evaluating multiple hybrid preprocessing variants (Weighted-CLAHE, CLAHE with bilateral filtering, Gamma-CLAHE) to determine the most effective enhancement technique for MRI-based deep learning models.

PUBLICATIONS

- **A. Taher** and S. Anan, "Multiclass Brain Tumor Classification and Segmentation from 2D MR Images: A Deep Learning Approach Using Custom CNN and Residual Attention U-Net," 26th International Conference on Computer and Information Technology (ICCIT), pp. 1-6, 2023. DOI: 10.1109/ICCIT60459.2023.10441606

- **A. Taher**, W. I. Z. Ayon, and M. S. Hossain, "Histopathological Image-Based Classification of Lung and Colon Cancer Using Deep Learning Architectures with Preprocessing Enhancements," in Proceedings of the 27th International Conference on Computer and Information Technology (ICCIT), 2024. DOI: 10.1109/ICCIT64611.2024.11022478
- **A. Taher** and W. I. Z. Ayon, "Exploring Sleep Disorders: A Comparative Analysis of Machine Learning Algorithms on Sleep Health and Lifestyle Data," 2024 IEEE International Conference on Power, Electrical, Electronics, and Industrial Applications (PEEIACON-24), 2024. DOI: 10.1109/PEEIACON63629.2024.10800593

PROJECTS

- Alzheimer Parkinson disease detection using Brain MRI: Developed a robust model leveraging EfficientNet-B7, achieving an impressive accuracy of 99.36%.
- Malaria Parasite detection from thin blood smear images: Developed a CNN model from scratch to detect parasitized red blood cells using the NIH Malaria Dataset, achieving an impressive accuracy of 95%
- Brain Tumor MRI analysis using Transfer Learning: Utilized pre-trained VGG19 and ResNet50 models as feature extractors and trained a custom model for tumor detection, achieving an accuracy of 82%.
- Breast Cancer prediction: Applied KNN regression and classification algorithms to analyze a structured dataset, achieving 94% accuracy.
- Image Classification using CNN: Built a Convolutional Neural Network model from scratch using a Kaggle dataset, achieving 81% accuracy.

SKILLS

Programming Language	Python, C
Frameworks & Libraries	Keras, TensorFlow, PyTorch, Scikit-learn, Pandas, Seaborn, Matplotlib
Paradigms	Algorithm Design, Statistical Modeling
Tools	Lucidchart, Draw.io, Power BI, Colab, Jupyter, Kaggle, Git/GitHub, Overleaf
Web Development	HTML5, CSS3, Node.js

LANGUAGE PROFICIENCY TESTS

- **IELTS** – Overall Band Score: **7** (Listening: 8.0, Reading: 6.5, Writing: 6.5, Speaking: 6.5)

TEACHING EXPERIENCE

Junior Instructor January 14, 2024 - Present
Computer Science Chittagong, Bangladesh
Asian University For Women

- Conduct classes of total 18 hours/week .
- Course: Programming With Python, Computational Thinking & Programming, Computer Fundamentals

Lecturer July 04, 2023 – January 03, 2024
Department of CSE Chittagong, Bangladesh
Port City International University

- Conducted total 22.5 credits per semester.
- Course: Structured Programming, Computer Fundamentals & Programming Techniques,Discrete Mathematics

ACHIEVEMENTS

- Awarded the Bangladesh Technical Education Board Scholarship (BTEB) based on term results
- Received a merit based scholarship for the University Undergraduate Admission Test-2017

- Champion of the Regional Astronomy Olympiad (2014)
- Silver Medalist in the Regional Physics Olympiad (2013)

EXTRA-CURRICULAR ACTIVITIES

- **Community Service:** Volunteering at a village orphanage.
- **Athletics:** Participated in short-distance marathons promoting health and awareness.
- **Fitness:** Regular practice of fitness exercises and calisthenics training for personal well-being.
- **Fundraising:** Volunteered in fund raising and relief committee for the flood affected area in 2024