Nur Mohammad Fahad

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Research Interest

My research interests are primarily in computer vision, focusing on medical imaging, machine learning with graphs, and algorithm optimization. I leverage graph-based models and deep learning techniques to enhance diagnostic accuracy and interpretability. I also work on optimizing neural networks to improve generalization in complex tasks. Additionally, I optimize algorithms for drone path planning and coverage planning, developing efficient strategies for navigating drones through complex environments to ensure maximum coverage with minimal resource usage.

Education

Bachelor of Science in Computer Science and Engineering 2019 - 2023
United International University
(CGPA: 3.63 / 4.00)
Major: Data Science

Experience

- **Consultant- Research Assistant (*Remotely*)** 22th November, 2023- Present
  Faculty of Science and Technology
  Charles Darwin University,
  Australia
- **Undergraduate Teaching Assistant** 15th February, 2023 - 23th May, 2023
  Department of Computer Science and Engineering
  United International University, Dhaka, Bangladesh

Achievement

- **Champion in System Analysis and Design Course Project- UIU Project Show**
- **Scholarship based on trimester result**
  (Obtained scholarship in several trimester)

Publications

Selected Journal Publication

[1] **NM Fahad**, S azam, S Montaha, and MSH Mukta ***"Enhancing Cervical Cancer Diagnosis with Graph Convolution Network: AI-Powered Segmentation, Feature Analysis, and Classification for Early Detection,"*** **Multimedia Tools and Applications, 2024** DOI: 10.1016/j.bspc.2024.106279 **[Q1]**
Impact: *This study emphasizes the segmentation and classification of various cervical cancer cell types. An intuitive but effective segmentation technique is used to segment the nucleus and cytoplasm from histopathological cells, and a robust graph convolution network (GCN) is introduced to predict the cervical cell types efficiently.*

[2] MAK Raiaan, **NM Fahad**, MSH Mukta, S Shatabda, ***"Mammo-Light: A lightweight convolutional neural network for diagnosing breast cancer from mammography images,"*** **Biomedical Signal Processing and Control, 2024,** DOI: 10.1016/j.bspc.2024.106279 **[Q1]**

Impact: *The main contribution of this study is to propose a solution for the multiclass classification of breast cancer, which is challenging due to the poor quality of mammography images that contain artificial noise. The proposed solution involves image enhancement techniques and the development of a robust model called Mammo-light, which achieves high accuracy and outperforms existing state-of-the-art studies.*

[3] MAK Raiaan, **NM Fahad**, S Chowdhury, D Sutradhar, SS Mihad, MM Islam, ***"IoT-based Object Detection System to Safeguard Endangered Animals and Bolster Agricultural Farm Security,"*** **Future Internet, 2023** DOI: 10.3390/fi15120372 **[Q2]**
Impact: *This study aims to strengthen farm security and safeguard endangered animals by utilizing advanced computer vision techniques combined with cloud and IoT technology. This method significantly improves the capability to monitor in real-time, resulting in more efficient conservation measures and decreased vulnerabilities to extinction.*

[4] MAK Raiaan, MSH Mukta, K Fatema, NM Fahad, S Sakib, MMJ Mim, J Ahmed, ME Ali, S Azam, ***A Review on Large Language Models: Architectures, Applications, Taxonomies, Open Issues and Challenges,"*** **IEEE Access, 2024** DOI: 10.1109/ACCESS.2024.3365742 **[Q1]**
Impact: *This review systematically presents the large language models by conducting comparative analysis to find challenges and give future research agendas.*

Underreview

1. **NM Fahad**, Alamin Sarker, and S Azam ***"Optimizing performance and privacy in anomaly classification of smart grids: A deep gated residual network with robust feature selection and the integration of Federated learning."*** **International Journal of Critical Infrastructure Protection, 2024Manuscript ID: IJCIP-D-24-00111 [Q1]**
Impact: *This study integrates the residual network with federated learning for effective anomaly detection in smart grid.*

2. **NM Fahad**, MAK Raiaan, AI Abian M Jonkman, and S Azam ***"Identifying different types of blood cells using segmentation, feature extraction, and a GraphSAGE model"*** **International Journal of Machine Learning and Cybernetics, 2024 Submission ID 224b4ea9-9876-40a5-9eee-c76e61e35bc5 [Q1]**
Impact: *This study conducted the simultaneous segmentation of WBC, RBC, and nucleus from blood cell images and developed a novel GraphSage model for the classification of the WBC type.*

3. **NM Fahad**, SI Azid, and S Azam ***"An innovative coverage path planning approach for UAVs to boost precision agriculture and rescue operations."*** **International Journal of Intelligent Systems, 2024 [Q1]**
Impact: *This study developed an innovative path coverage solution for UAVs integrating computer vision and grid-to-graph decomposition techniques.*

Ongoing Research

- Workstress detection from multi-modal data.
- Renewable Energy forecasting temporal GNN.

Technical Skills

Deep and Machine Learning Framework Skills	Keras, Tensorflow, Pytorch,NetworkX
Image Processing Skills	ImageJ, OpenCV, PIL
Programming Language	Python, C, C++, Java, PHP
Others	Neo4j, Latex, MySQL

Reference

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