Monirul Islam

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Portfolio | GitHub | LinkedIn

Summary

Passionate Data Scientist with 2+ years of experience in designing large scale, privacy-aware recommendation engines with a focus on analytics, applied machine learning across academia and industry, including roles at the Design Inclusion & Access Lab (DIAL) and Systech Datasoft. Expert in Trustworthy AI (LIME, Morris Sensitivity Analysis & GradCAM), Federated Learning, and Deploying scalable ML solutions with Flask, Django and Streamlit. Proficient in Python, PySpark, SQL, Tableau, AWS and Power BI, with hands-on experience in creating data-driven dashboards and insights. Published research works in Optimizing Stroke with Lasso, Fisher Score and Kendall's Tau feature selections and Linear Discriminant Analysis in Credit Scoring System, improving banking sector scalability for entrepreneurs by 10%.

Professional Experiences

Design Inclusion & Access Lab - DIAL Jul. 2023 – Jun. 2024
Research Assistant (RA)

- Collaborated on the 'Feasibility of Alternative Credit Scoring for the Credit Invincibles of Bangladesh' project funded by **NSU-CTRG (CTRG-23-SEPS-02)**.
- Working on 'Impact of Generative AI in Computer Science in context of Bangladesh', 'Trustworthy Attention Residual Convolutional Network based DeepFake Detection using LIME' and 'Federated Learning based secured Diabetic Foot Ulcer Detection using GradCam' project. ***Certificate***

Systech Datasoft, Dhaka Aug. 2023 – Dec. 2023
Trainee Engineer (Data Science)

- Customized an automated resume screening system for Systech Datasoft, Dhaka, using a dataset of public and collected candidate data to accurately predict suitability for positions with **97.92%** accuracy.
- Executed a **PDF parser** to extract candidate's email, name, and qualifications, enhancing the efficiency of the resume screening process. ***Certificate***

Projects

Unveiling the LinkedIn Job Hunt: Skill, Industry, and Salary Trends in the USA

- Designed an interactive **Tableau** Dashboard analyzing LinkedIn job trends across various industries, skill demands, and salary ranges in the USA. Incorporated dynamic storytelling with **skills, industries and states filter** to deliver actionable insights for **job seekers and employers.**

Empowering Elderly: Federated Learning for Activity Recognition with Mobile Sensor Data

- Activity Recognition for Elderly people with **72,000 collected** accelerometer and gyroscope data from our developed mobile app. Implemented **Federated Learning** with 3 local models to ensure data privacy. Also, XAI techniques - **SHAP** and **LIME** are used in this project. Lastly, a **Mobile App** is developed to detect activity from Mobile Accelerometer and Gyroscope using **Java**.

Feasibility of Alternative Credit Scoring for the Credit Invincibles of Bangladesh

- Merged dataset of public and collected Bank data (both Quantitative and Qualitative data) is used here. Also, **Permutation Feature Importance, Morris Sensitivity Analysis** and **SHAP** are implemented to explain the Blackbox machine learning models with **Linear Discriminant Analysis (LDA)**.

DataVerse: A Collaborative Q&A Platform for Data Science Enthusiasts

- Optimized a Question-and-Answer based web platform focused on Data Science topics, including Machine Learning, Deep Learning, NLP, and Data Analytics. Enabled users to ask questions, provide answers, and connect with professionals. Utilized NoSQL database **MongoDB** with **98,000 data** for scalability and ensured an intuitive user experience with dynamic web frameworks.

Trustworthy Attention Residual Convolutional Network (ARC-Net) based Deepfake Detection

- Implemented **ARC-Net**, a custom deep learning model combining Attention and Residual Mechanisms with EfficientNetB0 for deepfake facial image detection. Achieved **99%** accuracy and enhanced interpretability using Explainable AI (XAI) techniques - **LIME** and **Grad-Cam**.

DFU_DIALNet: A Novel Approach for Diabetic Foot Ulcer Detection with webapp

- Constructed **DFU_DIALNet**, a custom deep learning approach for detecting Diabetic Foot Ulcers with **99.33%** accuracy. Integrated model explainability using **LIME** and **Grad-CAM**, and deployed a user-friendly web app via **Streamlit** for practical application. **(Visit)**

Publication

[**1**] M. I. Mahmud, M. S. Reza, and S. S. Khan, **"Optimizing Stroke Detection: An analysis of different feature selection approaches,"** *Companion of the 2024 ACM International Joint Conference on Pervasive and Ubiquitous Computing, UbiComp '24, Australia*, pp. 142–146, Sep. 2024, doi:10.1145/3675094.3677602

[**2**] Md Shihab Reza, Monirul Islam Mahmud, Ifti Azad Abeer, and Nova Ahmed. 2024. **"Linear Discriminant Analysis in Credit Scoring: A Transparent Hybrid Model Approach."** International Conference on Computer and Information Technology (ICCIT). https://iccit.org.bd/2024/

Education

Georgia Institute of Technology — Atlanta, Georgia, United States
M.S. in Data Analytics
Major in Business Analytics Track

Fordham University — New York City, United States
M.S. in Computer & Information Science
CGPA: 3.67 - GSAS Centennial Scholarship holder

North South University — Dhaka, Bangladesh
B.Sc in Computer Science & Engineering
CGPA: 3.43

Skills

Language & Framework: PySpark, JS, D3.js, Tensorflow, Seaborn, Scikit Learn, Python, Django, Flask, Streamlit.
Database & Software: PostgreSQL, MongoDB, SQL, BigQuery, Jira, LaTeX, Looker, Docker, Tableau, Power BI.
Technical Skills: Machine Learning, Explainable AI (Permutation Feature Importance, Morris Sensitivity Analysis, GradCam, SHAP, LIME), Analytics (R, AWS, A/B Testing, Hypothesis Testing, SAS, SPSS, CI/CD).

Extra-Curricular Activities

Reviewer
IEEE Pervasive Computing (2024)
Evaluated and reviewed research paper submissions on Machine Learning topics.

Core Member, Content Writing Team
IEEE NSU Student Branch, Bangladesh
Contributed articles and technical content to enhance the branch's outreach and visibility.

Senior Member, Team Provision
NSU ACM Student Branch, Bangladesh
Collaborated on student-focused initiatives promoting computing education and innovation.