Abu Adnan Sadi

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Abu Adnan Sadi | Adnan-Sadi | Abu Adnan Sadi
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About

Computer Science graduate and incoming Ph.D. student in Computer and Information Sciences at DePaul University. My expertise intersects both academic research and applied engineering. Driven by a passion for building intelligent tools that solve real-world problems, I have conducted multidisciplinary AI research and gained hands-on experience developing AI-powered engineering tools and cloud-based web applications. I am eager to expand my technical expertise and collaborate with domain experts to continue making advancements in the field of AI.

Education

- **North South University** *2019 - 2022*
  Bachelor of Science in Computer Science and Engineering Dhaka, Bangladesh
  - **CGPA:** 3.82/4.00, **Distinction:** Summa Cum Laude

Experience

- **RoboFication LLC (Remote)** *April 2025 - July 2025*
  AI Engineer Michigan, United States
  - Contributed to frontend design of custom diagram and canvas elements of the new SysModeler, Inc. platform.
  - Implemented backend algorithms for the AI-driven SysML diagram generation.
  - Managed the DevOps operations of the SysModeler.AI platform using Azure Kubernetes Services (AKS) and helped develop the CI/CD pipeline.

  Junior AI Engineer *January 2025 – April 2025*
  - Contributed across backend, frontend, and DevOps during the early growth phase of RoboFication, the team grew from 3 (when I joined) to 13+ engineers.
  - Played a key role in building Robo Huddle Room - an AI-powered meeting assistant for engineers that provides live transcripts and automatically extracts key system design elements (specifications, hazards, documentation).
- **North South University** *September 2023 - December 2024*
  Research Assistant | ***Supervisor: Dr. Mohammad Ashrafuzzaman Khan*** Dhaka, Bangladesh
  - Conducted research in areas related to Natural Language Processing (NLP) and its application in the medical domain.
  - Led a research that proposed a method for utilizing light-weight transformer-based models for automatic differential diagnosis based on patient medical history and symptoms.
  - Published our preprint on ArXiv (featured on HuggingFace) and a demo of the diagnosis tool, integrating eight fine-tuned transformer models.

Research Interests

- Artificial Intelligence
- Machine Learning
- Natural Language Processing
- Computer Vision
- Explainable AI (XAI)
- Healthcare Informatics

Publications

C=Conference, J=Journal, P=Preprint, S=In Submission

[P.2] **Abu Adnan Sadi**, Mohammad Ashrafuzzaman Khan, and Lubaba Binte Saber. **"Automatic Differential Diagnosis using Transformer-Based Multi-Label Sequence Classification."**, arXiv preprint, 2024, doi: https://doi.org/10.48550/arXiv.2408.15827.

[C.2] **Abu Adnan Sadi**, Ziaul Hossain, Ashfaq Uddin Ahmed, and Md Tazin Morshed Shad. **"A Comparative Study on Plant Diseases Using Object Detection Models."** In **Science and Information Conference**, pp. 419-438. Cham: Springer Nature Switzerland, 2024, doi: https://doi.org/10.1007/978-3-031-62269-4_29.

[J.1] Md Yearat Hossain, Ifran Rahman Nijhum, Md Tazin Morshed Shad, **Abu Adnan Sadi**, Md Mahmudul Kabir Peyal, and Rashedur M. Rahman, **"An end-to-end pollution analysis and detection system using artificial intelligence and object detection algorithms."** Decision Analytics Journal, vol. 8, p. 100283, 2023, doi: https://doi.org/10.1016/j.dajour.2023.100283.

[P.1] **Abu Adnan Sadi**, Labib Chowdhury, Nusrat Jahan, Mohammad Newaz Sharif Rafi, Radeya Chowdhury, Faisal Ahamed Khan, and Nabeel Mohammed. **"Lmfloss: a hybrid loss for imbalanced medical image classification."**, arXiv preprint, 2022, doi: https://doi.org/10.48550/arXiv.2212.12741.

[C.1] Md Yearat Hossain, Ifran Rahman Nijhum, **Abu Adnan Sadi**, Md Tazin Morshed Shad, and Rashedur M. Rahman, **"Visual Pollution Detection Using Google Street View and YOLO."** 2021 IEEE 12th Annual Ubiquitous Computing, Electronics Mobile Communication Conference (UEMCON), New York, NY, USA, 2021, pp. 0433-

0440, doi: 10.1109/UEMCON53757.2021.9666654.

PROJECTS

- **Automatic Differential Diagnosis using Transformer-Based Multi-Label Sequence Classification**
  Supervised by: Dr. Mohammad Ashrafuzzaman Khan
  The project's aim was to utilize encoder-based transformer models to predict differential diagnoses based primarily on a patient's medical history and symptoms. We proposed an approach for transforming tabular patient data into textual patient reports to provide context to the language models. We fine-tuned models such as BERT, DistilBERT, RoBERTa, and Bio-BERT. We also designed several behavioral tests to stress test the models, identifying the limitations and areas for improvement.
- **LMFLOSS: A Hybrid Loss for Imbalanced Medical Image Classification.**
  Undergraduate Capstone Project* | *Supervised by: Dr. Nabeel Mohammed
  In order to address the imbalance issue of medical image datasets, we proposed a hybrid loss framework called LMFLoss. We performed a quantitative analysis of the performance of LMFLoss along with existing loss functions across multiple datasets and CNN networks. Additionally, we provide qualitative analysis using Grad-CAM attention maps and UMAP projections.
- **Visual Pollution Detection using Google Street View and Object Detection Algorithms.**
  Supervised by: Dr. Mohammad Rashedur Rahman
  The goal of this project was to use object detection models for the automatic detection of visual pollutants present in the environment. We created a new 'Visual Pollutant Dataset' by manually collecting images of Dhaka city from Google Street View. We cleaned and annotated the images and then fine-tuned object detection models to detect the pollutants. Our findings were published in the 2021 IEEE UEMCON conference and the Decision Analytics Journal.
- **A Comparative Study on Plant Diseases Using Object Detection Models**
  Supervised by: Dr. Ziaul Hossain
  We performed a detailed comparative analysis of the performance of different object detection models for plant disease detection. We preprocessed and annotated image data from two datasets to prepare a hybrid dataset. We compared the performance of multiple models, such as YOLOv5, Scaled YOLOv4, and SSD. Our findings were published at the 12th SAI Computing Conference 2024.

SKILLS

- **Programming Languages:** Python, Java, PHP, JavaScript, TypeScript, C, C++
- **Machine Learning & Data Analysis:** PyTorch, TensorFlow, Scikit-learn, Hugging Face, OpenCV, NumPy, Pandas, Matplotlib, NLTK
- **Web Development Frameworks & Libraries:** React, FastAPI, Laravel, NextJs, WebSocket, React Query, Tailwind CSS, Vite, npm, Poetry
- **Databases & Cloud Services:** MySQL, SQLite, MongoDB, Azure, Azure Cosmos DB, Azure Kubernetes Service
- **DevOps:** Docker, Kubernetes
- **Version Control & Collaboration:** Git, GitHub, Trello, Slack, Overleaf