

Abu Adnan Sadi

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Chicago, IL, United States

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

- **DePaul University** 2025 - Present
Doctor of Philosophy in Computer & Information Sciences Chicago, IL, United States
- **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

- **DePaul University** September 2025 - Present
Graduate Assistant | Supervisor: Dr. Casey Bennett Chicago, IL, United States
 - * Conducting research on conversational AI and social robots designed to support older adults, including individuals living with dementia.
 - * Assisting in the design and development of a conversational speech system for social robots.
- **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
- Conversational AI
- Digital Health

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++
- **AI, Machine Learning & Data Analysis:** PyTorch, TensorFlow, Scikit-learn, Hugging Face, OpenCV, NumPy, Pandas, Matplotlib, NLTK, LangChain, LangGraph
- **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, Google Cloud
- **DevOps:** Docker, Kubernetes
- **Version Control & Collaboration:** Git, GitHub, Trello, Slack, Figma, Overleaf