# FARHAN NOOR DEHAN

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I am currently working with Dr. AKM Mahbubur Rahman on data-driven Social NLP problems, applying advanced AI and machine learning techniques to solve real-world challenges. I have led several machine learning projects from research to deployment, gaining experience in designing and optimizing AI models. My undergraduate work, mentored by Dr. AKM Mahbubur Rahman, Dr. Amin Ahsan Ali, Dr. Asraful Islam, and MD. Fahim, involved projects in error correction datasets and models, graph-based algorithms, hate speech detection, and LLMs, with a focus on scalable solutions for both academic and industrial applications.

## PROFESSIONAL PROFILES

**LinkedIn:** https://www.linkedin.com/in/dehan-noor-6554ba21a/
**GitHub:** https://github.com/Dehan001
**Kaggle:** https://www.kaggle.com/farhannoordehan

## RESEARCH INTERESTS

My primary research interests lie in the fields of Natural Language Processing (NLP), Artificial Intelligence (AI), Machine Learning (ML), Computer Vision, and Data Science. I am particularly excited about exploring the following areas:

- Low-resource NLP, including Question Answering (QA), Natural Language Inference (NLI), and Named Entity Recognition (NER) *[p1, p2, p3, p4]*

- *Hate Speech Detection, Sentiment and Emotion Analysis, Fake News Detection, and Sarcasm Recognition* [p1, p2, p3]

- Applications of AI in social and industrial contexts *[p1, p2, p3, p4]*

## EDUCATION

**Independent University Bangladesh**                    *JAN 2019 - JUL 2024*
BSc in Computer Science and Engineering
**CGPA: 3.78/4.00**
**Dissertation**: BaTEClaCor: A Novel Dataset for Bangla Text Error Classification and Correction. [Read Thesis] [Slides]
**Supervisor**: Dr. AKM Mahbubur Rahman

**Cantonment Public School & College, Rangpur**                    *2016 - 2018*
Higher Secondary School Certificate (HSC)                    **GPA:**5.00/5.00

**Cantonment Public School & College, Rangpur**                    *2014 - 2016*
Secondary School Certificate (SSC)                    **GPA:**5.00/5.00

## WORK EXPERIENCE

**Center for Computational & Data Sciences, IUB**                    *Dhaka*
**Student Researcher**                    *October 2022 - Present*
I managed and contributed to various projects aimed at enhancing our research outcomes:

- **Error Correction and Classification Dataset**: Developed a comprehensive dataset from YouTube comments to address prevalent errors. Our team scraped comments using the YouTube API and annotated 25,000 entries. We benchmarked the dataset with BanglaT5 and BanglaT5 Small models and established classification benchmarks using graph-based and transformer models.

- **Large Language Models**: Fine-tuned smaller versions of large language models, including Gemma-2B, TinyLlama, Falcon-1.3B, and OPT-1.3B, for classification tasks. Employed prompt engineering techniques for zero-shot and few-shot classification using ChatGPT 3.5-turbo, Gemma 7B, and LLaMA 3.1.

- **Graph-Based Models**: Implemented various graph-based algorithms and their combinations for Bangla text, contributing novel methodologies to the field.

**FAB Lab IUB**                                                                   *Dhaka*
**Undergraduate Student Researcher**                    *January 2020 - December 2022*
I managed and contributed to multiple projects aimed at enhancing our innovative capabilities:

- Gained hands-on experience in designing and implementing diverse research projects, including smart tree plantations, wall-following robots, and Arduino-based circuits.

- Developed a 4-bit signed integer multiplier using the Booth Algorithm, demonstrating practical algorithmic implementation.

- Integrated temperature and humidity sensors for real-time monitoring across various projects, significantly enhancing data collection capabilities.

- Acquired practical expertise in using Arduino Uno to create functional devices and utilized Proteus software for circuit design and simulation, optimizing designs prior to physical implementation.

## RESEARCH AND PUBLICATION

**Published:**

p1 Farhan Noor Dehan, Md Fahim, AKM Mahbubur Rahman, Md Amin Ali, Md Asraful Amin "Investigating Effectiveness of Graph-Based Algorithms for Bangla Text Classification." (7th December 2023, at the BLP Workshop in EMNLP)

**Accepted:**

p2 Farhan Noor Dehan, Md Fahim, AKM Mahbubur Rahman, Md Amin Ali, Md Asraful Amin "TinyLLM Efficacy in Low-Resource Languages: An Experiment on Bangla Text Classification Task." (Accepted at ICPR 2024)

**In Preparation**:

p3 **How Well Does GPT-4 Perform on BanglaNLP Tasks? A Comparative Study with Fine-Tuned Models and Other GPT Variants.**

p4 **Hate Speech Detection in Low Resource Language.**

## TEACHING EXPERIENCE

| **Independent University Bangladesh** | *Dhaka* |
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| **Teaching Assistant (Data Structures)** | *Oct 2023 - Nov 2023* |

- Prepared and updated lecture slides to align with the new syllabus for CSC203 Data Structures.
- Created visualizations to effectively demonstrate various data structures in practice.
- Provided one-on-one programming tutorials and assistance to students.
- Managed Google Classroom for the course, ensuring streamlined communication and efficient resource sharing.

## PROJECTS

1. **Data-Driven Insights into Exoplanet Characteristics and Discovery Trends**
   This project involved gathering, cleaning, and transforming raw data on exoplanets into meaningful visual insights. The final Tableau Dashboard, available for public access, provides an interactive platform to explore exoplanet characteristics and discovery trends. **GitHub**

2. **Pet Breed Recognizer**
   Developed a pet breed recognizer by extracting images of various pet breeds and utilizing a ResNet model, Gradio, and Hugging Face for image recognition. **GitHub**

   To see my other projects, visit **my GitHub**.

## SKILLS

**Programming Languages:** Python, C++, C, Java, JavaScript
**Frameworks:** PyTorch, Fastai, TensorFlow, Keras, Gensim
**Tools and Libraries:** Git, Kaggle, LaTeX, Google Colab, Hugging Face, HTML, CSS
**Languages:** Bangla (Native), English (Fluent), Hindi (Conversational), French (Elementary), Japanese (Elementary)

## AWARDS AND SCHOLARSHIPS

| **Merit Scholarship, IUB** | *Summer 2020 - Spring 2023* |
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Awarded Merit Scholarships from IUB, waiving 70% of my undergraduate tuition (5% acceptance rate).

| **Vice Chancellor's Honors List, IUB** | *Summer 2022* |
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| **Vice Chancellor's List, IUB** | *Autumn 2022* |

For a comprehensive list of my achievements, please visit my **LinkedIn profile**.

## ACTIVITIES

| **General Member, English Language Club, IUB** | *January 2021 - March 2024* |
|---|---|

Participated in various events and discussions aimed at improving English language proficiency and communication skills.

| **General Member, JUKTI, IUB** | *January 2021 - December 2022* |
|---|---|

Engaged in activities related to logic, reasoning, and debates on a variety of topics, fostering critical thinking and teamwork skills.