

# Rasel Meya

Researcher • Machine Learning • Artificial Intelligence

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## Education

### M.Sc. in Computer Science & Telecommunication Engineering

Aug 2021 – May 2023

Noakhali Science and Technology University (NSTU), Noakhali, Bangladesh

- **CGPA:** 3.62/4.00
- **Thesis:** *MedicineNet: A Custom CNN-Based Approach for Recognizing Medicine Names in Handwritten Prescriptions.*
- **Coursework:** Machine Learning, Cloud Computing, Wireless Sensor Networks, Stochastic Process & Modeling

### B.Sc. in Computer Science & Telecommunication Engineering

Jan 2018 – Jan 2021

Noakhali Science and Technology University (NSTU), Noakhali, Bangladesh

- **CGPA:** 3.29/4.00
- **Thesis:** *Detection of Autism Spectrum Disorder Based on Optimal Feature Selection Using Machine Learning*
- **Coursework:** Data Structures, OOP, DBMS, AI & Neural Networks, Data Mining, Image Processing

### Higher Secondary Certificate (HSC)

2016

Shahabuddin College, Dhaka, Bangladesh

- **Group:** Science
- **GPA:** 4.83/5.00

### Secondary School Certificate (SSC)

2014

Raghunathpur High School, Bangladesh

- **Group:** Science
- **GPA:** 5.00/5.00

## Research Interests

- Natural Language Processing (NLP) with a focus on **low-resource languages** such as Bengali
- Large Language Models (LLMs): **fine-tuning, evaluation, prompt-based learning, and generative AI applications**
- Transformer architectures and advanced **attention mechanisms**
- Multilingual AI systems and **Retrieval-Augmented Generation (RAG)** pipelines
- Applied AI in healthcare and medical text/image understanding
- AI-driven code generation and **cross-lingual problem-solving frameworks**
- Core NLP and lexical semantics, focusing on **word embeddings, context-dependent meaning**, and

## **polysemy/monosemy modeling**

- Semantic representation learning and **word sense disambiguation** in multilingual and **low-resource language** settings

# Research Publications

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## Conference Proceedings

**2025:** *Prompt-Based Fine-Tuning of Bangla Language Models for Sequence Classification.* Springer LNCS.

DOI: [10.1007/978-981-96-2721-9\\_27](https://doi.org/10.1007/978-981-96-2721-9_27)

*This study applies prompt-based fine-tuning for Bengali sequence classification, introducing Instruction and Label Information Prompting to boost accuracy by 2–4% using only 20% of the training data.*

## Journal Articles (Under Review)

### **Detection of Autism Spectrum Disorder Based on Optimal Feature Selection Using Machine Learning.** Submitted to Journal

*This study presents a machine learning framework for early detection of Autism Spectrum Disorder (ASD) using optimal feature selection techniques. We compare multiple feature selection algorithms and classification models, achieving high accuracy with reduced feature sets, making the approach suitable for clinical screening applications.*

### **MedicineNet: A Deep Learning Architecture for Recognizing Medicine Names in Handwritten Prescriptions.** Submitted to Journal

*This study introduces MedicineNet, a custom CNN designed to recognize medicine names from handwritten prescriptions. The model effectively captures spatial features and outperforms hybrid CNN–RNN variants, achieving 91.03% accuracy and demonstrating strong potential to reduce prescription errors in healthcare.*

# Research Experience

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## Independent Researcher

*AI and NLP Research, Bangladesh*

*2022 – Present*

- Conducting independent research in **Natural Language Processing (NLP)** and **Large Language Models (LLMs)** for low-resource languages, with a focus on Bengali.
- Built a **Transformer Encoder–Decoder** model from scratch for **Bengali–English machine translation**, demonstrating end-to-end implementation and performance evaluation on bilingual datasets.
- Fine-tuned advanced models such as **Mistral**, **DeepSeek**, and **LLaMA** for Bengali multi-label text classification, and released related datasets on Hugging Face for public use.
- Built a **Multilingual Retrieval-Augmented Generation (RAG)** system that supports Bengali and English queries, using OCR preprocessing, FAISS-based vector search, and MiniLM embeddings for accurate question answering.
- Developed a **Multi-Task LLM Web Platform** with Streamlit that offers text and audio summarization, document conversion, content generation, and intelligent Q&A features.
- Created **Lekhoni**, a handwritten Bengali dataset platform that collects character samples for OCR and handwriting recognition research.
- Published **Directory Visualizer**, a PyPI CLI tool that generates Markdown or Mermaid-based directory trees for large software projects.
- Researched **prompt-based code generation** using translated LeetCode problems across English, Bengali, Hindi, and French to explore multilingual reasoning in programming tasks.
- Worked on several **AI/NLP industry projects**, developing APIs and ML pipelines for text summarization, OCR, document classification, and speech-to-text using models like Mistral, Whisper, and T5.

# Professional Experience

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## AI Engineer

Oct 2023 – Present

Tappware Solution Limited, Dhaka, Bangladesh

- Leading R&D initiatives in **AI, NLP, and Generative LLMs**, focusing on real-world applications in Bengali and English.
- Designed and deployed **LLM-powered applications** including AI Summarizer, Invoice Info Extractor, Resume Analyzer, and YouTube Video Summarizer.
- Built robust **NLP pipelines** for text classification, sentiment analysis, OCR, document parsing, and content generation.
- Integrated and fine-tuned **LLMs** models for summarization, question answering, and speech-to-text.
- Implemented efficient backend systems and APIs to support AI/ML models in production environments.
- Conducted data preprocessing, feature engineering, and model optimization for scalable deployment.
- Collaborated cross-functionally with product and research teams to align AI solutions with organizational goals.

## Machine Learning Engineer (Intern)

Oct 2022 – Jan 2023

Tappware Solution Limited, Dhaka, Bangladesh

- Researched and implemented **Elasticsearch-based ranking and indexing systems** for large-scale data retrieval.
- Contributed to **NLP projects**, including Bengali text extraction and automation.
- Documented system deployment and optimized model configurations under Linux environments.
- Supported senior engineers in model testing, evaluation, and integration.

# Technical Skills

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- **Programming:** Python, C, C++, R (Basic), SQL, JavaScript
- **Machine Learning:** TensorFlow, PyTorch, Keras, scikit-learn
- **NLP/LLM:** Transformers, Hugging Face, VectorDB (FAISS, ChromaDB), RAG, LangChain
- **Data Processing:** Pandas, NumPy, OpenCV, Matplotlib, Seaborn
- **Frameworks:** Django, FastAPI, Streamlit
- **Tools:** Git, Docker, Linux, Jupyter Notebook, LaTeX
- **Specialization:** Bengali NLP, Model Fine-Tuning, Generative AI

# Achievements & Activities

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- Published **1 Springer-indexed paper** and have **2 manuscripts under review** in AI and NLP domains.
- Released multiple **Bengali NLP datasets** and fine-tuned **LLM models** on Hugging Face for open research.
- Recognized for **research presentations** at AI and Language Modeling symposiums.
- Developed and published the **Directory Visualizer** PyPI package for visualizing directory structures.
- Earned **Kaggle Expert** status and solved over **2000 competitive programming problems** on CodeForces, LeetCode, and HackerRank.
- Completed certifications in **Machine Learning**, **Deep Learning**, and **Natural Language Processing** (Coursera, Kaggle).
- Served as a **Campus Ambassador** for the *National Girls' Programming Contest (NGPC) 2021–2022*.
- Worked as a **Problem Setter** for the *Intra NSTU Saif Memorial Junior Programming Contest 2020*.
- Volunteered as an **Account Manager** at the *Student Progress Association of Raghunathpur* (Nov 2018 – Dec 2020), overseeing financial operations.

## References

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### **Dr. Nazia Majadi**

Professor, Dept. of Computer Science & Telecommunications Engineering  
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### **A.R.M Mahamudul Hasan Rana**

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