

# Nazmun Nahar

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## RESEARCH INTEREST

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Human Centered Computing, NLP, Information Retrieval, Data Science

## WORK EXPERIENCE

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<b>Principal Research Engineer</b> <a href="#">MedAi Health Limited</a>	2021 - Present
<b>Assistant Programmer</b> <a href="#">Janata Bank PLC</a>	2021 - 2022
<b>Lecturer</b> <a href="#">Bangladesh Institute of Science and Technology</a>	2019 - 2020

## PUBLICATIONS

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- Shariar Kabir; **Nazmun Nahar**; Mamunur Rashid; Shayamasree Saha.” Automatic Speech Recognition for Biomedical Data in Bengali Language” **arXiv preprint arXiv:2406.12931 (2024)**.[\[pdf\]](#)
- **Nazmun Nahar**; Shariar Kabir; Sumaiya tasnia khan; Suparna Das; Shyamasree Saha; Mamunur Rashid. ”AmarDoctor: First Multilingual Digital Platform For AI-Driven Primary Care Triage And Patient Management System For Bengali Speakers”. (Working on).[\[ pdf\]](#)[\[suppl. data\]](#)

## AWARDS & ACHIEVEMENTS

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- **AmarDoctor** by MedAi Health has been selected as one of the six solvers out of 2200+ participants world-wide for the **MIT Solve 2024 Global Health Equity Challenge Award** for its innovative approach to accessible healthcare. [Source](#)

## EDUCATION

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<b>Bachelor of Science</b> Computer Science and Engineering <a href="#">Bangladesh University of Engineering and Technology</a>	2015 - 2019
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- **Project & thesis:** Bengali Text Recognition Using Deep Learning, under the supervision of Professor [Dr. Md. Monirul Islam](#). For this project, I created a word image dataset from printed documents, annotated it, then trained deep neural networks on it using a variety of methods, including CNN, RNN, LRU, and others. .
- **Coursework:** Artificial intelligence, Structured programming language, Object oriented programming language, Data Structures, Algorithms, Database, Computer architecture, Software engineering and information system design, Software development, Basic graph theory and others

## PROJECTS

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<b>Symptom Checker &amp; Clinical Decision Support System</b> This is an intelligent module that, in both Bengali and English, refers patients to the appropriate specialist physicians based on their identified signs, symptoms and concerns. Additionally, it prepares a preliminary diagnosis for physicians as part of ongoing research on the accuracy of our system’s disease identification	<a href="#">[Demo]</a>
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## Medical Assistant Chatbot

[[GitHub](#)]

People can discover doctors who can aid them with their concerns by using this conversational chatbot. Patients may find it challenging to decide which expert to see, but this medical assistant AI BOT makes the process easier by suggesting physicians who focus on mental or physical health. This was created using the **RASA** framework, which is based on **NLU**.

## Fine Tuning a Stable Diffusion Model

[[GitHub](#)]

To enhance user experience and provide more visually appealing symptom icons, I fine-tuned a Stable Diffusion model to generate custom **vector arts** for image data. This process involved preparing images, generating preliminary captions with image-to-text model, curating the captions, and training a Lora model.

## Bengali Clinical NER (in progress)

To automate the process of generating structured clinical SOAP notes, we are working to develop a comprehensive **Clinical Bengali NER** system. This system aims to retrieve medical entities like symptom, disease, diagnostic test, medicine and duration from patient-provided text or voice data. However, a major obstacle is the lack of a comprehensive Bengali **patient-physician conversation** dataset. To overcome this challenge, we have collected real patient data and are working to annotate and train this dataset for effective context aware medical information retrieval.

## Amazon Web Services

I have significant experience in cloud engineering. I deployed our back-end servers on **EC2 instances** and configured **API Gateway** to enable API access. Additionally, I have experience with various AWS services including **S3 buckets, Route 53, AMI, AWS NLB, VPC and SES**.

## Django Back-end

Created a complete Django back-end using **TypeDB, PostgreSQL, SQLite** and a **REST architecture** for our healthcare platform, **AmarDoctor**. A significant portion of my work was designing databases, systems and other infrastructure in addition to creating and managing APIs.

## SKILLS

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<b>Programming Languages</b>	Python, C, C++, Java, SQL, PostgreSQL, TypeQL
<b>Natural Language Processing</b>	NER, NLU, LLM, RASA, NLTK
<b>Machine Learning</b>	Tensorflow, Keras, PyTorch, Huggingface Trnasformers, Diffusers
<b>Data Science</b>	Pandas, Matplotlib, NumPy
<b>Software Development</b>	DRF, Firebase, VOIP notification, Swarm Locust, API testing
<b>Amazon Web Services</b>	EC2, Route53, S3 bucket, API Gateway, SES, Load balancer, vpc
<b>Others</b>	Git, Bash script, Web Scraping, Sphinx, Jira, Confluence

## REFERENCES

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### 1. Dr. Mamunur Rashid

Assistant Professor

[Birmingham University, UK](#)

**Email:** m.rashid.1@bham.ac.uk

### 2. Dr. Shayamasree Saha

Chief Technical Officer

[Medai Health Limited](#)

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### 3. Dr. Md. Monirul Islam

Professor

[Bangladesh University of Engineering & Technology](#)

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