Nazmun Nahar

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RESEARCH INTEREST

Human Centered Computing, HCI, Digital Health, Informatics, NLP, Data Science

WORK EXPERIENCE

Principal Research Engineer   2021 - Present
MedAi Health Limited

Assistant Programmer   2021 - 2022
Janata Bank PLC

Lecturer   2019 - 2020
Bangladesh Institute of Science and Technology

PUBLICATIONS

1. Shariar Kabir; **Nazmun Nahar**; Mamunur Rashid; Shayamasree Saha."Automatic Speech Recognition for Biomedical Data in Bengali Language" **arXiv preprint arXiv:2406.12931 (2024).**[pdf]

2. **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

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

EDUCATION

Bachelor of Science   2015 - 2019
Computer Science and Engineering
Bangladesh University of Engineering and Technology

- **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 and trained a deep neural network model.
- **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

AmarDoctor : Ai-powered digital health [2021 - 2023]   [Demo]

I worked with **Dr. Mamunur Rashid** and **Dr. Shyamasree Saha** to develop the first prototype of an. AI-driven digital health platform for Bengali speakers. This platform, named "**AmarDoctor**" (My Doctor), provides symptom checking and provisional diagnosis support in the local language. To build this system, we created a medical dataset comprising symptoms, diseases, and their weighted relationships, which were meticulously translated into colloquial Bengali variations and two widely used dialects. This dataset contributed to the collection of audio symptom data to train our Bengali ASR module [**pub.1**]. The resulting platform, AmarDoctor, is a testament to our efforts in bridging the language gap in digital healthcare [**pub.2**]

Leveraging AWS and Django for Scalable Healthcare Solution [2022 - present]

My experience in cloud engineering and back-end development has enabled me to build robust and scalable healthcare solutions. For our healthcare platform, **AmarDoctor**, I developed a comprehensive Django back-end utilizing TypeDB, PostgreSQL, and SQLite, adhering to REST architecture principles. My responsibilities extended beyond API creation and management to encompass database design, system architecture, and infrastructure setup. I have effectively utilized AWS services such as EC2, API Gateway, S3, Route 53, AMI, AWS NLB, VPC, and SES to deploy and manage our back-end architecture.

Medical Assistant Bot [2023]   [GitHub]

To assist individuals with low health literacy in finding appropriate specialists, I developed an **NLU**-based medical assistant bot using the **RASA** framework for AmarDoctor. This bot interactively queries users to identify the intent of their responses and directs them to either a general physician or a mental healthcare provider.

Bengali Clinical NER [2024 - present]

To automate the process of generating clinical SOAP notes, I am working with **Dr. Shyamasree Saha** to develop a comprehensive **Clinical Bengali NER** system which 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.

SKILLS

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

REFERENCES

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
Email: shyama.saha@medaihealth.com

3. Dr. Md. Monirul Islam

Professor
Bangladesh University of Engineering & Technology
Email: mdmonirulislam@cse.buet.ac.bd