Nazmun Nahar

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Research Interest

Human Centered Computing, NLP, Information Retrieval, Social Media Analysis, Data Science

Work Experience

Research Software Engineer 2021 - Present

MedAi Health Limited

Assistant Programmer 2021 - 2022

Janata Bank PLC

Lecturer 2019 - 2020

Bangladesh Institute of Science and Technology

Publications (published/working on)

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

Symptom Checker & Clinical Decision Support System [Demo]

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

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.

NER pipeline & Symptom Normalization (in progress)

Our application takes in audio input, converts it to text, and then uses a NER Pipeline to extract text containing information about diseases, symptoms, drugs, and other topics. We used a **Clinical-NER** Bert model for this objective. We are now employing the English NER methodology to construct a Bengali NER. This endeavor is difficult because there aren't many dataset resources available in Bengali for NER. Gathering and annotating this dataset is our goal for future usage. Since the system is not perfect when it comes to speech to text conversion, we utilize **Bio-Bert** based text normalization technique to obtain an appropriate mapping of that symptom.

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, 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

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, AMI, SES, Elastic IPs
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

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Bangladesh University of Engineering & Technology
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