SHARIAR KABIR

AI Research Engineer

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SKILLS

Machine Learning
Deep Learning
Natural Language Processing
Large Language Models
Model Quantization
Computer Vision
Data Analysis
Data Mining
Big Data
Image processing
Serverless Computing

TECH STACK

Languages

Python
Java
JavaScript
Scala
C
C++
LaTeX
SQL
TypeQL
Assembly

Libraries

Pandas
Datasets
ScikitLearn
OpenCV
Transformers
SpaCy
PyTorch
Huggingface
TensorFlow
SocketIO
OpenGL
CTranslate2

Model Experience

LLaMA
Falcon
Adapters
Mixtral
LoRA
QLoRA
DIET
BERT
DeepSpeech
Whisper
YOLOv5

ABOUT ME

I am an avid researcher deeply passionate about exploring the convergence of natural language processing and human-computer interaction. With a solid foundation in software development and engineering, I bring a unique blend of practical experience and academic insight to my work. My journey is driven by a curiosity to improve human-machine interaction, fostering innovation at this intersection.

EDUCATION

MSc | Bangladesh University of Engineering and Technology

April 2019 – Present | Dhaka, Bangladesh

- GPA: 3.50
- Thesis: Dynamic Resource Allocation for Workloads in Serverless Architecture using Collaborative Filtering. Under the supervision of Dr. Muhammad Abdullah Adnan
- Coursework: Bioinformatics Algorithms, Distributed Computing Systems, Data Mining, Data Management in the Cloud, Advanced Database Systems, Advanced Artificial Intelligence.

BSc | Bangladesh University of Engineering and Technology

February 2015 – April 2019 | Dhaka, Bangladesh

- GPA: 3.53
- Thesis: Active Learning on Big Data; A research on how we can apply active learning on big data in a distributed cloud computing system. Under the supervision of Dr. Muhammad Abdullah Adnan
- Coursework: Machine Learning, Pattern Recognition, Computer Graphics, Artificial Intelligence, Digital Image Processing, Data Structures, Database, Operating Systems, Software Development, Computer Architecture, Microprocessors and Microcontrollers, Computer Networks, Concrete Mathematics, Discrete Mathematics, Numerical Methods, Software Engineering and Information System Design, Compiler, Data Communication, Digital Logic Design, Structured Programming Language, Object Oriented Programming Language, Theory of Computation

PUBLICATIONS

SynthNID: Synthetic Data to Improve End-to-end Bangla Document Key Information Extraction

2023 | BLP Workshop at EMNLP

AgnoSVD: Dynamic Resource Allocation for Serverless Workloads using Collaborative Filtering | In progress

2024 | USENIX ATC

Frameworks

LangChain | RASA | Flask | FastAPI | Spark | PySpark | OpenWhisk | PyQT

Tools

Jupyter | Colab | Git | Maven | NginX | Keycloak | Docker | Kubernetes | Ansible | AWS EC2 | AWS lambda | AWS Cognito | Grafana | PostgreSQL | TypeDB

LANGUAGES

Bengali: Native

English: C1

REFERENCES

Dr. Mamunur Rashid
Assistant Professor in Bioinformatics, University of Birmingham

Dr. Shyama Shaha
Cheif Technical Officer, MedAI UK Limited

Dr. Muhammad Abdullah Adnan
Professor in CSE, Bangladesh University of Engineering and Technology

EXPERIENCE

AI Research Engineer | Celloscope Limited

September 2020 – Present — Dhaka, Bangladesh

Building AI-based solutions in local languages for intelligent broad user-centric applications that can save users' time and reduce complexity in daily banking-related tasks.

NLP and Data Scientist| Part time | MedAI Bangladesh Limited

August 2021 – Present — Dhaka, Bangladesh

Extracting data-driven insights from multimodal raw medical data and enhancing the capabilities of large ASR models and LLMs to better comprehend the nuances of medical symptoms and developing a clinical decision support system.

DevOps | Cokreates Limited

May 2019 – August 2020 — Dhaka, Bangladesh

Automating the deployment process and monitoring of numerous microservices.

RECENT PROJECTS

ASR System for Patient Symptoms

January 2022 – February 2023 — MedAI Bangladesh Ltd.

ASR system for understanding medical symptoms spoken by patients in Bengali language. We trained the **DeepSpeech** model from scratch using audio data collected from consented users using our audio data collection portal. We finetuned the model for a noisy environment, using the 13 domain augmentations provided by Deepspeech. This model performed poorly when the user says any out-of-vocabulary words. Therefore we finetuned a **Whisper** (tiny) model specifically the BanglaASR model which was trained using Bangla Mozilla Common Voice Dataset. The model performs with a WER of only 8%. The performance is due to the limited vocabulary of symptoms.

Voice Banking Chatbot |

January 2022 – March 2023 — Celloscope Ltd.

Bangladesh's pioneering Voice-based AI Chatbot using **RASA** for seamless banking activities, serving hundreds of thousands of real users. Agrani Bank is one of the largest state-owned banks in Bangladesh, with a huge number of customers who have very little access to information. Agrani Voice Banking makes banking services accessible to everyone. It is powered by Bengali ASR and a finetuned NLU engine for natural language-driven fund transfers and inquiries. It can behave dynamically based on the input messages by the user.

SynthCases Creator and Disease Classifier

May 2023 – December 2023 — MedAI Bangladesh Ltd.

A recommendation system based on ensemble classifiers for diseases based on patients' symptoms. The classifier is trained on synthetic data generated to reflect real-world demography. The generator takes into account patients' risk factors family history and medical history. The classifier uses a multi-layer pipeline for making predictions where in the first step it predicts the probability of each disease based on the symptoms, then it uses a prevalence look-up table for filtering the most probable diseases based on ethnicity, finally, it makes the prediction using the filtered diseases and patients risk-factors.

Realtime Liveness Checker

December 2023 – Ongoing — Celloscope Ltd.

Analyzing real-time facial movements, blinking and requiring the user to perform specific facial actions during the authentication process of eKYC to ensure the presence of a live person. Developed to be used in mobile devices like smartphones.