

Faisal Ahmed

AI Researcher & Developer

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Website — GitHub — LinkedIn — YouTube

RESEARCH INTERESTS

Language & Speech Processing: Information extraction, text-to-speech, speech-to-text, Conversational AI, speech-to-speech Models

Generative AI : Large Language Models (LLMs), Retrieval Augmented Generation (RAG), Agentic AI systems, Multimodal generation (speech, vision, text)

Computer Vision & Pattern Recognition: Smart traffic monitoring systems, Vehicle detection, Optical Character Recognition (OCR)

Biomedical & Healthcare AI: Biometric Recognition, Biomedical signal processing, Facial recognition

WORK EXPERIENCE

Business Automation Limited, Dhaka, Bangladesh

November, 2024 - Present

Machine Learning Engineer

- Developed an automatic speech recognition system for the English language.
- Developed an AI model for auto-suggestion and cluster-based remark suggestions in a product.
- Developed a face verification-based authentication system for a web portal and extracted user information using OCR from PDF and images.
- Data archiving pipeline development using Apache NiFi and Airflow
- EDA on project data and developed an interactive visualization web application using Plotly Dash
- Developed a website backend service using FastAPI and PostgreSQL that includes SMS and email sending modules, and custom PDF generation.

Next Solution Lab, Dhaka, Bangladesh

February, 2024 - October, 2024

AI Engineer

- Developed deep learning-based product, Virtual Try-On. This application allows digitally try on clothes and accessories without wearing the product. [Link]
- Developed deep learning-based OCR solution according to the business requirements
- Research and develop transformer-based Non-English Language model for text classification, question answering, text summarizing, etc.

AI Engineer (Associate)

April, 2022 - January, 2024

- Developed industrial analog and digital meter recognition solutions using object detection, text recognition. [Link]
- Developed name entity recognition (NER) solution for non-English documents
- Conduct different R&D for Computer Vision and NLP-based paper implementation and product feature improvements. [Link]

EDUCATION

Khulna University of Engineering & Technology, Khulna, Bangladesh

February, 2017 -

April, 2022

Department of Computer Science and Engineering

B.Sc.(Eng.), CGPA: 3.41/4.00

Thesis: A Study of Building Infrastructure Recognition Using Deep Learning Methods [GitHub]

RESEARCH PAPERS

F. Ahmed, M. Mahmudul Islam and S. M. Masudul Ahsan, "Building Infrastructure Classification with Hybrid Convolutional Neural Network Architecture," 2021 5th International Conference on Electrical Information and Communication Technology (EICT), Khulna, Bangladesh, 2021, pp. 1-6, doi: 10.1109/EICT54103.2021.9733635. [Link]

SKILLS

Languages	Python, C/C++, Java, JavaScript, PHP, LaTeX
ML/DL Tools	TensorFlow, Keras, PyTorch, SpaCy, Transformer, LangChain
Web Development	FastAPI, Flask, Django, React JS, Laravel
Database	MySQL, PostgreSQL, MongoDB
Data Engineering & DevOps	Apache NiFi, Apache Airflow, Redis, Docker

PROJECTS

Document QA RAG System FastAPI [GitHub]

A powerful document question-answering system built using retrieval augmented generation (RAG) architecture, FAISS Vector Search, and a FastAPI backend. It supports both Bengali and English for querying documents and provides context-aware answers. The application was deployed using Docker. The user can upload a PDF to the web application and ask questions about it.

Tech Stack: LLM, RAG, Llama 3.3, FAISS, FastAPI, Docker

Bangla Sentence Punctuation Restoration [GitHub]

A transformer-based Bangla model was used to build the sentence punctuation model. Llama 3.2 was also used to infer with non-punctuation sentence correction. FastAPI was used to prepare the API for deployment with Docker.

Tech Stack: BanglaBERT, LLM, Llama 3.2, FastAPI

Chattogram language to standard Bangla language conversion [GitHub]

Developed a transformer-based Seq2Seq model to convert the local Chattogram language to standard Bangla. The data was processed by the sentencepiece tokenizer. The model is trained on an encoder-decoder with an attention mechanism.

Tech Stack: Python, PyTorch, Transformers, Seq2Seq

Brain Tumor Classification Vision Transformer [GitHub]

The Vision Transformer (ViT) model was used for brain tumor classification. The model classifies brain MRI images into four categories: glioma, meningioma, no tumor, and pituitary tumor using the transfer learning from the pretrained **google/vit-base-patch16-224** model.

Tech Stack: Python, PyTorch, ViT, Transformer, MRI, Medical AI

Automatic Wrong Side Vehicle Detection System [GitHub]

Developed a YOLO v10-based wrong-side vehicle movement detection. The wrong side vehicle was detected using the YOLO v10 model and the license plate number was extracted using EasyOCR.

Tech Stack: Python, PyTorch, YOLOv10, EasyOCR

EXTRA CURRICULUM ACTIVITIES

- Published computer science related tutorials in YouTube [Link] [35K+ views and 450+ subscribers]
- Published **Natural Language Processing with Python** course on YouTube [Video Link] [GitHub]
- **General Secretary**, Software Research & Development Community of KUET