

# Azizul Hakim

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**Tech Skills:** Python, C / C++, JavaScript. | Flask, FastAPI | React, React Native | AWS S3 / EC2, GCP, Docker, Git / GitHub, Bash | SQL / MySQL, MongoDB | Tensorflow, PyTorch, Keras, NumPy, Pandas, Scikit-learn, NLTK, OpenCV, HuggingFace.

## WORK EXPERIENCE

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### Graduate Assistant | Grand Valley State University | Grand Rapids, MI, USA | January 2023 - Present

- Conducted experiments with zero-shot and few-shot prompt engineering techniques initially on ChatGPT, then on open-source Large Language Models (LLMs) like LLaMA to create an unstructured to structured requirement converter.
- Designed a multi-panel visualization tool utilizing Flask and React, Docker, and MongoDB to convert semi-structured requirements into knowledge graphs and structured formats.
- Built an active learning pipeline to facilitate the continuous training and testing of the CodeT5 model.
- Devised a GPU enabled Docker containerized LLM API and CodeT5 converter API using LangChain.
- Currently fine-tuning Mistral-7B with custom unstructured to structured requirement conversion data using PEFT and LoRA.

### Machine Learning Engineer | Reea Digital | Dhaka, Bangladesh | November 2022 - December 2022

- Evaluated the performance of BERT based state-of-the-art Natural Language Processing (NLP) models like ALBERT, RoBERTa, and DistilBERT for automatic data preprocessing and annotation at the research and development phase.
- Fine-tuned an Electra-QA model to annotate watch features from raw descriptions.
- Over a 10-fold reduction in data annotation costs and time by leveraging large language models for data annotation.

### Research Engineer | United International University | Dhaka, Bangladesh | March 2022 - September 2022

- Developed full-stack artificial intelligence based Smart Receptionist web application, with React frontend, Flask backend, and MySQL database.
- Deployed the microservices on a Linux server using Docker and Nginx containerization.

### Machine Learning Engineer | Gigalogy | Dhaka, Bangladesh | March 2020 - October 2021

- Built NLU, an intent and named entity recognition (NER) engine, capable of integrating into existing chatbots with FastAPI.
- Devised an AI voice assistant based on the NLU engine.
- Created computer vision based REST API using OpenCV and TensorFlow for age-gender prediction, and emotion recognition from images and videos.
- Evaluated YOLO object detection algorithm for inference and memory usage.
- Experimented with TFLite and ONNX conversion of object detection models.
- Enhanced deep learning based object detection inference time by over 50% by resolving CUDA GPU memory leaks in Darknet and deployed containerized microservice on AWS EC2.
- Composed a scheduled batch upload of object detection results to AWS S3 using Celery and Redis.
- Created a product search engine using Elasticsearch with text and categorical filters.
- Integrated image recommendations to existing recommendation engine through image processing and feature vectorization.
- Implemented an ML based budget predictor for online ad campaigns using feature engineering and unsupervised learning.

## PROJECTS

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### rag-chatapp | [web app](#) | [github](#)

- A financial assistant chatbot powered by Retrieval Augmented Generation (RAG) with Streamlit, LlamaIndex, ChatGPT, Selenium, multithreading, and Docker to answer questions regarding finance by scraping through the latest financial news.
- Deployed on GCP with cloud build and cloud run CI/CD pipeline.

**Enhanced pyvis:** Integrated graphical add, delete, and edit functionality to nodes and edges in the [pyvis](#) module. [github](#)

## EDUCATION

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**Grand Valley State University** | Master's in Applied Computer Science | Grand Rapids, MI, USA | Jan. 2023 - Dec. 2024

**Chittagong University of Engineering & Technology** | Bachelor in Computer Science | Chattogram, Bangladesh | Mar. 2014 - dec. 2018

## PUBLICATIONS

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- [Real-time Vision-based Bangla Sign Language Detection using Convolutional Neural Network](#), ICACC 2021.
- [Handwritten Bangla Numeral and Basic Character Recognition Using Deep Convolutional Neural Network](#), ECCE 2019.