Nazia Tabassum Toma

Machine Learning Engineer

GitHub
LinkedIn
Portfolio
(203) 628-1978
ntabassum.toma@gmail.com
Oakville, Connecticut, 06779

EDUCATION

Master of Engineering, Computer Science - ***(4.0/4.0)***
University of Cincinnati, Cincinnati, Ohio, USA ***August 2023 - April 2025***

Bachelor of Science, Computer Science & Engineering - ***(3.7/4.0)***
North South University, Dhaka, Bangladesh ***June 2017 - December 2021***

PROFESSIONAL EXPERIENCE

University of Cincinnati, Cincinnati, Ohio, USA ***January 2025 - Present***

Capstone Project – LLM based Personalized Computer Science Notes & Quiz Generator

- Built a custom dataset by scraping GeeksforGeeks XML pages using ***BeautifulSoup***.
- Fine-tuned CodeLLaMA-7B-Instruct model with ***LoRA***, using quantized training, enabling efficient markdown-style note generation from topic prompts.
- Developed custom tokenization and implemented zero, one and few shot ***prompt engineering*** techniques to reduce hallucinations and improve factual quality across topics.
- Built a ***RAG pipeline*** to generate Data Structures & Algorithms quizzes from GeeksforGeeks content and AI-generated notes.
- Implemented vector embeddings and indexes using ***LangChain*** and ***Databricks Vector Search*** for semantic retrieval.
- Used Mixtral-8x7B-Instruct to generate topics, quiz questions, correct answers, and distractors with custom prompts.
- Developed a learning style personalization algorithm using ***Bayesian theorem*** to adapt CS notes to individual learning preferences.
- Created a chatbot integrating ***OpenAI API, Django***, and ***React*** for interactive note generation and quizzes.

Taco Tango Food Truck Ordering App, Oshawa, Canada (Remote) ***April 2024 - Present***

Software Developer

- Developed a custom standalone desktop app for a food truck owner to take customer orders, built using ***Python, Tkinter*** for the backend and frontend, and ***SQLite*** for local data management.
- Implemented a ***responsive design*** that allows taking new orders, displaying pending ones, and marking orders as done within a single window, with completed orders moved to an excel report, ***reducing order processing time by 40%*** and improving workflow efficiency.
- Implemented order customization with over 10 menu options, allowing users to add and modify menu items as needed.
- Delivered the initial app ***within one week***, which increased the ***customer satisfaction by 30%***.

Barikoi Technologies Ltd, Dhaka, Bangladesh ***July 2021 - September 2021***

Machine Learning Engineer Intern

- Barikoi Technologies is a startup in Bangladesh, specializing in map and location-based services, providing versatile geocoding APIs that enhance navigation, logistics, and service delivery by converting area information into accurate road addresses and vice versa.
- Tackled the challenge of ***parsing unstructured and inconsistent Bangladeshi address data***, where users input addresses in various formats, making it difficult for standard tech solutions to identify roads, house numbers, and other components in an address.
- Developed and trained ***NLP models*** using ***spaCy*** for the ***flagship product "Rupantor"*** to accurately identify and extract geographic locations from messy, unstructured addresses.
- Expanded the limited dataset by using ***data augmentation*** to improve model generalization and reduce overfitting.
- Cleaned and prepared datasets using ***Python's pandas library***, ***improving model accuracy by 15%***, and structured the data in JSON format for smooth integration.
- Created ***comprehensive documentation*** to support the development and usage of trained models, ensuring clarity.

PERSONAL PROJECTS

Efficient Meal & Grocery Planner (Multi-Agent System)

- Designed and deployed a ***multi-agent orchestration system*** using ***Python*** and ***OpenAI APIs*** to automate meal planning and grocery budgeting.
- Developed specialized agents for LLM-based meal plan generation, ***real-time grocery price retrieval***, and budget optimization with ***asynchronous workflows***.
- Integrated ***Judgeval SDK*** for agent workflow tracing and debugging; built a modular CLI with support for user preferences, retry logic, and structured data parsing.

Automated Bug Classification and Resolution Prediction System

- Developed an NLP system in ***Python*** to classify bug reports into Concurrency, Performance, and Other types, and predict their resolution status.
- Tested multiple machine learning algorithms, including ***SVM, Multinomial Naive Bayes, Random Forest, and BERT***, achieving up to ***88% accuracy*** in bug classification and ***73% accuracy*** in resolution prediction.

Comparative Study on Machine Learning Approaches in Detection of Facial & Vocal Paralysis

- Developed a deep learning model to expedite stroke detection by analyzing facial drooping and speech paralysis, applying the FAST system.
- Utilized models such as ***VGG-16, ResNet50, InceptionV3, ANN, CNN, and RNN*** to enhance detection accuracy.

Coupon Searching Platform

- Developed a dynamic Coupon searching platform using ***Python (Django), HTML***, ***CSS***, ***Bootstrap***, and ***MySQL***, enabling users to search for discounts from various Bangladeshi E-commerce websites.
- Created an admin dashboard for managing coupons, allowing super admins to add, edit, and remove coupon codes, enhancing platform control and user engagement.

RESEARCH EXPERIENCE

North South University, Dhaka, Bangladesh ***May 2021 - October 2021***

Undergraduate Researcher

Cross-Content Recommendation between Movie and Book Using Machine Learning

- Co-authored and published a paper that introduces a recommendation system using NLP and machine learning to recommend movies to book lovers (and vice versa) based on genre similarities like action, science fiction etc.
- Collaborated in creating and annotating a combined dataset of movie and book descriptions, and applied TF-IDF vectorization to analyse content similarities.
- Implemented and tested ***machine learning algorithms***, including ***K-means clustering***, ***hierarchical clustering***, and ***cosine similarity***, using subjective judgment to evaluate results due to the absence of ground truth labels.

SKILLS

- **Languages & Frameworks:** Python, C, JavaScript, HTML, CSS, Bootstrap, Django, React, Tkinter
- **Libraries:** Pandas, NumPy, spaCy, TensorFlow, PyTorch
- **LLMs:** Hugging Face, OpenAI API, LangChain, RAG, LoRA, Prompt Engineering
- **Databases & Cloud:** MySQL, SQLite; AWS (EC2, S3, RDS, Route 53, CloudFormation, SageMaker)
- **Advanced Skills:** API Design, Unit Testing (TDD), Design Patterns, Software Licensing, Technical Debt Analysis

CERTIFICATIONS

- **Generative AI with Large Language Models** - *Coursera* ***2025***
- **Ultimate AWS Certified Developer Associate 2025 DVA-C02** - *Udemy* ***2025***

AWARDS AND RECOGNITION

Magna Cum Laude for Academic Excellence – *North South University* ***2023***
Recognition of Service to ACM as Chair of NSU ACM-W Student Chapter - *ACM HQ, USA* ***2020***
Best Industrial Solution – HackNSU Season 2 Hackathon ***2020***

- Led a team of three to develop an automated procurement system using ***Python, HTML, CSS, JavaScript, and Dart***, featuring a user-friendly interface in Bengali for non-technical vendors.
- Integrated inventory management, order tracking, payments, and reporting features, which reduced labor costs and processing time; awarded Best Industrial Solution **among 50+ teams** for innovation.

LEADERSHIP EXPERIENCE

- **Chair – NSU ACM-W Student Chapter,** *North South University* ***October 2019 - December 2020***
- **Convener – BASIS Students' Forum – NSU Chapter,** *North South University* ***September 2019 - December 2020***