MD SAZZAD HOSSAIN

Machine Learning Engineer

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SUMMARY

Machine Learning Engineer with 3+ years of experience developing impactful solutions to real-world problems using advanced machine learning techniques, specializing in computer vision (CV) and natural language processing (NLP). Proficient in large-scale data preprocessing, exploratory data analysis (EDA), and feature engineering, with a proven track record of designing and optimizing scalable machine learning pipelines for both training and inference. Experienced in fine-tuning models to improve accuracy and performance, ensuring the scalability, reliability, and efficiency of AI solutions in production environments. Adept at deploying machine learning models to tackle complex challenges using Python, Pytorch, and Scikit-learn. Collaborates with cross-functional teams to identify and prioritize AI requirements, ensuring seamless integration of machine learning solutions into business processes.

EXPERIENCE

Devolved AI (Uttara, Dhaka)

Machine Learning Engineer **03/2024- Present**

- Led a team of three members to develop Athena 2.0.
- Design and build custom architectures for Large Language Models (LLMs) tailored to specific NLP tasks, ensuring optimal alignment with use case requirements.
- Pre-train, optimize, and fine-tune models to meet performance benchmarks, enhancing task-specific outcomes and overall accuracy.
- Continuously evaluate LLM performance and apply iterative improvements to boost scalability, efficiency, and model effectiveness.
- Extract high-quality datasets from diverse sources, including text corpora for LLM tasks.
- Preprocess large datasets, including cleaning, feature engineering, normalization, tokenization, and text encoding for LLMs.
- Generate instruction and evaluation datasets to validate models and drive continuous improvement.
- Build and optimize scalable machine learning pipelines for efficient data processing, training, and inference.
- Collaborate with software engineers to ensure seamless integration and deployment of AI models into production environments.
- Engineered a streamlined pipeline that manages raw data, federated training, and model evaluation.
- Project Done: Athena 2.0 Developer Version for decentralized Athena LLM training, Athena Web chat application and Athena 2.0 Client application for desktop version.

Cloud-coder Ltd. (Gulshan-2, Dhaka) **01/2022- 03/2024**

Software Engineer

- Led the development of "**RoyalGPT**," a Bangla Language Model, advancing NLP for regional languages and contributing to open-source projects.
- Developed the "SpeechToSpeech" project utilizing Bengali ASR and TTS models, integrated with the RoyalGPT Bangla Language Model.
- Designed and implemented a Retrieval-Augmented Generation (RAG) system for RoyalGPT, enhancing its ability to retrieve and generate contextually relevant information.
- Designed and built an ASR system for Bengali regional dialects.
- Engineered a real-time television ad and channel detection system using detection models, optimizing performance with advanced hashing techniques for faster processing.
- Designed and deployed a dynamic digital signage system in shopping malls, leveraging human behavior analysis to deliver personalized product information and promotions.
- Developed a multi-camera security surveillance system for real-time tracking of human and vehicle movements, enhancing security and operational efficiency.
- Designed a RISC-V vector extension compiler in C, optimizing performance and extending functionality for RISC-V architecture in embedded systems.

Technical Skills

Programming Expertise: Proficiency in Python and C++ languages.

Deep Learning Frameworks: Expertise in PyTorch, Spacy, OpenCV and Scikit-learn.

Data Tools: Experience with NumPy, Pandas and Dask for data analysis.

Databases: Knowledge of Pinecone, Chromadb for similarity search, and MySQL for relational data.

GenAI Framework: Experience in LangChain, LlamaIndex, Ollama, DeepEval, Uptrain, Transformers.

Agent Framework: Expertise in developing and optimizing SmolAgents for scalable and efficient solutions.

Generative AI Models: Hands-on experience with transformer-based models for various applications.

Generative AI : Expert in developing RAG and Agents system, with strong skills in pretraining, fine-tuning, and LoRA.

MLOps and Automation: Familiarity in DVC, Git Actions, Docker and MLFlow for scaling AI operations.

Real-Time Processing: Familiarity with Kafka, and event stream processing for dynamic data workflows.

Web Framework: Familiarity in Flask and FastAPI Frameworks.

Management Tools : Expertise in Miro, Jira and Trello for project Management.

Versioning: Experience with Git and Bitbucket.

Others: Microsoft Office, CustomTKinter

EDUCATION

Daffodil international University (Savar, Dhaka, Bangladesh)   (2018 – 2021)
B.Sc. in Computer Science and Engineering

GPA : 3.91/ 4.0

Thesis Topic:

Projects**:**
- Java Desktop GUI app : FarClient (source code)
- Build Own Linux distro : Subuntu (Short video)

Personal Projects

"**Sales-campaign-crm-agent**"-an Automated Sales Outreach Agent for CRM Workflow Optimization.

"**Speech-to-Speech Chatbot**"- a real-time speech-to-speech chatbot, enables seamless voice-based interactions.

"**AgentSync**"-A production-ready AI agent framework designed to manage and automate complex tasks efficiently.

"**AL-Fattah**" – A multi-expert transformer-based Bengali Language Model.

Chronical Disease Prediction ML based website. Github

Video and Image background Remover using ML technique.Github

Machine learning based website Github

Competitive Programming

Online Judge URI 122+ solved

CodeForces 28 solved

Certifications

- Complete PYTHON Programming for Beginners2021 - Udemy
- Python And Flask Demonstrations Practice Course - Udemy
- Pandas Masterclass: Advanced Data Analysis with Pandas –Udemy
- Data Visualization & Data Wrangling Masterclass with Python –Udemy
- Ultimate Python Bootcamp For Data Science & Machine Learning – Udemy
- Python Complete Course For Beginners –Udemy
- Machine Learning- From Basics to Advanced – Udemy

OTHER

Publications & Research: Co-authored of 'ML_SPS: Stroke Prediction System Employing Machine Learning Approach' published in International Conference on Artificial Intelligence and Data Science · Dec 14, 2022

Achievement: Daffodil Inter-department Math Olympiad 2019 2nd Runner Up.
HackerRank python gold badge

LANGUAGES

English Professional || Bengali Native