Bindu Priya Kamma

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Education

Program	Institution	Year of Passing
B.Tech - ICT	Dhirubhai Ambani Institute of Information And Communication Technology	2021

Relevant Courses

- Machine Learning
- Deep Learning
- Design and Analysis of Algorithms
- Natural Language Processing
- Probability Statistics
- Data Structures

Skills and Tools

Programming Languages: C, C++, Python

Frame works and Web Services: LangChain, AWS, Kubernetes, Tensorflow, Pytorch, Streamlit, Fast API, Ray, ONNX

Tools: MLflow, Weaviate, Elastic Search, Argilla, Docker, Matlab, Lambda, MongoDB, Snowflake

Work Experience

Phenom **May 2022 - Current**

Machine Learning Engineer *Hyderabad*

- Instruction Fine tuned LLM on Zephyr, Mistral 7B using QLora for Entity Extraction like skills, degree etc., and deployed via Inferentia2 using large model inference containers.
- Implemented data augmentation on underperforming model patterns through Langchain's few-shot prompting on GPT-3.5 Turbo, effectively retraining the model to significantly enhance its efficiency and performance.
- Enhanced open-source tool for enabling users to upload knowledge bases for in-depth troubleshooting and analysis of intricate issues in RAG and LLM applications by using UMAP for embedding analysis and HDBSCAN for cluster identification,.
- Developed an AI prototype to protect against prompt injection (PI) attacks through a multi-layered defense.
  - LLM-based detection: Trained a Binary Classifier by Fine-tuning DeBERTa model to spot PI attacks.
  - VectorDB: Store embeddings of previous attacks in a vector database to recognize and prevent similar attacks in the future.
- Implemented Learn To Rank (LTR) with LambdaMart model and employed Vector Search in Elasticsearch (ES) using the HNSW algorithm for Optimizing free-text search, delivering personalized results based on individual user journeys, past interactions, and similar user behavior:
  - Orchestrated the successful scaling of the solution to cater to 300+ clients elevating the overall NDCG score by a 13 percent boost in search relevance.
- Implemented a Multi-Armed Bandits(Thompson Sampling) setup for real-time model performance testing, dynamically adapting to changing user distributions and prioritizing variants based on reward optimization.
- Designed and implemented a Continuous Training Pipeline Architecture utilizing SageMaker Pipelines, significantly improving the efficiency of model deployment and management processes.

- Implemented Cluster Autoscaling, Horizontal Pod Autoscaling, and Spot Instance Adoption in K8's reducing company infrastructure costs by 15 percent.

ZS Associates **October 2021 - May 2022**
Data Science Associate *Bangalore*

- Developed a robust framework for Rare Disease Event Prediction by extracting essential patient features from claims data. This framework involved training an Adaptive PU (Positive-Unlabeled) model to identify patients exhibiting similarities to those diagnosed with rare diseases.
- Developed a framework to assess the probability of patient switches within Line of Therapy (LOT) during specific timeframes, utilizing patient claims data. This involved feature extraction from diverse data sources and the training of LightGBM and XGBoost models to enhance predictive accuracy.
- Developed a Model Monitoring Framework focused on data drift detection using statistical methods such as p-values and population index derived from feature importance analysis. Additionally, implemented model drift assessment. Automated email notifications were integrated to prompt retraining when necessary, ensuring model reliability and performance.

Casaone **Jan 2021 -July 2021**
Data Science Intern *Bangalore*

- Enhanced user experience by designing and implementing Recommendation Systems, incorporating advanced models like Content-Based Filtering. Achieved a notable 6 to 12 percentage increase in cart conversion rates
- Developed a Reverse Image Search system, starting with object detection through YOLO-V3 trained on a custom dataset. Extracted image features and leveraged the Faiss library to identify nearest neighbors within the dataset, enhancing search capabilities and user experience.

Project Works

Neural Network Captcha Breaker(Research Internship) **June -July 2020**
Under the Guidance of Prof.Manish Khare *DA-IICT Gujarat*

- During my research internship, I focused on enhancing security by developing an innovative Convolutional Recurrent Neural Network with Connectionist Temporal Classification (CRNN-CTC) model, aimed at breaking Neural Network-based CAPTCHAs. This project successfully demonstrated the model's effectiveness in addressing security vulnerabilities within modern CAPTCHA systems.
- The proposed model delivered outstanding results, achieving average accuracies ranging from 89 to 94 percentage across five diverse datasets. Additionally, the system demonstrated remarkable efficiency, with an average time to break a text-CAPTCHA scheme ranging from 0.0032 to 0.21 seconds.