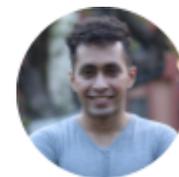


Yashraj Motwani

Assistant Manager (AI - NLP R&D)



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SUMMARY

Highly enthusiastic and detail-oriented professional in Gen AI and NLP R&D with 2 years of work experience, for Capability Development and AI Research work with impact on clients leading in Energy, Healthcare, Finance and Travel domains. Proficient in building NLP functionalities and known for exceptional problem solving skills. Skilled at coordinating cross-functional multi-national teams and efficiently working in an agile environment.

WORK EXPERIENCE

EXL | Assistant Manager (AI-NLP R&D Team) | Bengaluru, India

(Jul'22 – Sep'24)

Capability development as a part of the R&D Team in NLP, in Azure and AWS, to enhance EXL's NLP capabilities in Energy, Healthcare and Travel domains

- Developed an unsupervised intent clustering system for analyzing transcripts, leveraging **GPT-3.5**, **LLaMa 2**, and **LLaMa 3** to generate embeddings, **K-Means**, **DBSCAN**, and **HDBSCAN** algorithms for hierarchical clustering of distinct intents, and generated interactive visualizations with agglomerative clustering
- Fine-tuned LLMs like GPT 3.5, Llama 2, and flan-t5 on custom data, using techniques like **LoRA**, **Q-LoRA**, and few-shot learning for domain specific generation
- Functionalized a cutting-edge research paper based on DNNC: A technique using NLI, KNNs, and few shot learning for low latency sequence classification
- Mechanized a NER pipeline by stacking **BERT-CRF** and reverse question answering models, and iterative RoBERTa finetuning to get cutting edge accuracies
- Fine-tuned base models including BERT, **RoBERTa**, **BART** and **DistilBERT** for vulnerability detection, question answering, summarization and NER
- Benchmarked instruct based LLMs like variations of **flan-t5** and **falcon**, for extractive and generative summaries and for reverse question answering PoCs
- Contributed to the development of the EXL's custom **embedding models** to serve models of several NLP use-cases so as to deploy models for clients faster
- Constructed client-facing demos for the AI models, leveraging **FastAPI** for API endpoints and **Streamlit** for interactive web applications in **Azure** environments
- Developed chatbot backend in Octave programming for clients, leveraging Amelia's low-code AI platform harnessing geolocation and OpenAI APIs

PROJECTS & INTERSHIPS

LangChain Competitive Analysis Tool (Independent Self Project)

(Sep'24)

- Independently developed an AI-powered competitive analysis tool, using a Streamlit app and **LangGraph agent** with GPT-3.5 for iterative query refinement
- Engineered a robust **RAG** pipeline, integrating and benchmarking state-of-the-art retrieval models including ColBERT, SPLADE, DPR, BM25-BERT Hybrid, ANCE, MiniLM and Reformer, for dense and hybrid retrieval techniques

AI-powered Product Discovery Assistant (Independent Self Project)

(Sep'24)

- Built a knowledge graph using **NetworkX** and **RDF**, leveraging Schema.org vocabulary for structured representation and migrating to **Neo4j** for scalability
- Utilized **LangChain** to create a query processor that translates natural language into structured KG queries and integrates with a local **SQL** database of product reviews for comprehensive results

Bosch India | Customer Sentiment Analysis | Bengaluru, India

(May'21 - Aug'21)

Objective: Represented Bosch's collaborative assistance to a Sentiment Analysis project on India's Automotive Industry, at IIM Bangalore

- Engineered novel NLP based industry research, using lexicons, BERT models and **feature engineering** with **TF-IDF** vectors achieving accuracy of **93.22%**
- Prototyped Customer Sentiment Analysis Tool (CSAT): A Django web-application for automated web scraping and sentiment analysis, with backend: Transformers, BeautifulSoup, Selenium; frontend: HTML, Bootstrap, and a windows installer built for 3 browsers using cmd scripts

Sungkyunkwan University | Deep Learning Research | Seoul, South Korea

(Jan'21 - Aug'21)

Objective: To discover the optimum Deep Learning architecture for reconstruction of variables observed at JSNS2 detector, Japan

- Pioneered research in energy reconstruction using **Graph Neural Networks (GNN)** in spektral library improving MAE by **46%** over other architectures
- Optimized Multilayer Perceptrons (MLP) using **Genetic Algorithm**, 1D - Convolutional Neural Networks (1D-CNN) using HyperBand and Bayesian optimization with Kerastuner, and Gradient Boosting with **XGBoost** using Grid Search techniques followed by extensive regression analysis

IIT Kharagpur | Data Science Research | Kharagpur, India

(Aug'20 - Apr'22)

Objective: Analysis of Cyclonic heat data and impact of Global Warming with Deep Learning assisted forecasting in the Bay of Bengal

- Engineered novel research to forecast sea temperature using **CNNs + RNNs (CRNN)** with time-distributed 2D Convolutional, LSTM layers with parallelization

Johannes Gutenberg University of Mainz | Data Analysis | Mainz, Germany

(May'20 - Oct'20)

Objective: Geometrical Data Analysis and Simulation Software Development to study new sensors for IceCube Observatory, Antarctica

- Designed and programmed a novel simulation algorithm based on concepts of **Gradient Descent** and Binary Search using python and C

SKILLS AND EXPERTISE

Building NLP architectures, Fine-tuning LLMs, Langchain, LangGraph, LangSmith, NER, Text Summarization, CNNs, RNNs, GNNs, Hyperparameter Tuning, Transfer Learning, PyTorch, TensorFlow, Keras, Spektral Python, SQL, C++, Octave, HTML, CSS, Django, BeautifulSoup, Selenium, Git, Azure, Azure devOps, AWS

ACADEMIC BACKGROUND

Year	Degree/Exam	Institute	CGPA/marks
2022	B.TECH + M.TECH Dual Degree 5yr	IIT Kharagpur	6.83/10
2017	HSC	Nowrosjee Wadia College	79.08%
2015	ICSE	The Bishops' School, Pune	93.33%

LEADERSHIP, VOLUNTEERING AND EXTRACURRICULARS

- Supervised a **ML** project team of 15+ people in spAts IIT Kgp
- Headed a group of **50+** to organize various events at NSSC (India's Largest Space Tech Fest)
- Empath Writer for mental health at 'Humans of Safe Places'
- 2 gold medals at Inter IIT Cultural events
- Inter IIT Aquatics Team: Part of IIT Kgp team