Hardik Maisuria

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Education

Master of Science in Computer Science | Arizona State University — **Tempe, AZ**
Courses: *Generative AI, Cloud Computing, Data Processing at Scale, Statistical ML, Data Mining.* — **Graduating:** *May 2025*

Bachelor of Technology in Computer Science and Engineering | Nirma University — **Ahmedabad, India**
Courses: *Deep Learning, Database Management System, Big Data, Probability and Statistics, Linear Algebra.* — **Graduated:** *May 2023*

Technical Skills

Programming languages: Python, C++, SQL.
Frameworks/Libraries: PyTorch, TensorFlow, Hugging Face, Transformers, LangChain, Keras, OpenCV, scikit-learn, pandas.
Tools/Cloud Services: Azure, AWS, Docker, Kubernetes, Git, Jira, Power BI, Tableau.

Work Experience

Research Aide @ DynamiCog Lab — **September 2024 - Present**
- Leveraging **NLP techniques for preprocessing and fine tuning LLaMA model** to develop de-identification algorithm, ensuring secure, large-scale analysis of $\sim$ 2**M patient-provider conversations**.
- **Training ML classifiers** to detect Potential Comparative Effectiveness Deliberations (PCED) i.e. treatment decision-making discussions, enhancing predictive insights into patient-centered outcomes.

Maintainer of align (Analyzing Linguistic Interaction with Generalizable techNiques) @ PyPI — **September 2024 - Present**
- Submitted several pull requests, enhancements, bug-fixes, and documentation patches to **open-source** align package on PyPI on GitHub for creating **new semantic alignment feature**.
- Written multiple test cases using **Pytest**, achieving **95% test coverage** to ensure code reliability and robustness.

Research Aide @ Embodied Games Lab — **May 2024 - Present**
- Developing AI-driven mobile physics game utilizing LiDAR to give personalized, real-time tutoring based on user actions.
- Built **Multi-Agent AI system** using prompt-tuned LLMs to generate human-like Socratic textual and audio feedback.
- Engineered **New Evaluation Metric** called **SPF** - Socratic Precision F1 Score and ensuring efficient **on-device** functionality.
- Conducting **Multimodal data analysis** by integrating LiDAR motion data and conversational transcripts.
- Integrated **Guardrails** to ensure generated feedback is ethical, safe, and Socratic in nature.

Lead Data Analyst @ Business Technology Analytics Association — **January 2024 - May 2024**
- **Led a team of 6 analysts** to identify top 10 regions mirroring Saint Petersburg's buying patterns, optimizing promotions for a beverage enterprise.
- Implemented advanced **data preprocessing and statistical analysis techniques**, refining raw data quality using **Python**.
- Conducted clustering, EDA (pandas, seaborn, scikit-learn), and created **Power BI** dashboards for stakeholder insights.

Artificial Intelligence Intern @ State Street — **January 2023 - July 2023**
- Developed a **Document Intelligence and Understanding tool** (to extract important data from clients' documents), eliminating unnecessary intermediate Business Units (i.e., cost-cutting).
- Engineered a feature to parallelly process multiple input documents and metadata files using **Python and Flask scripts**.
- **Fine-tuned LayoutLM, a Transformer based Multimodal LLM**, combining **Natural Language Processing and Computer Vision** techniques to extract crucial information from unstructured business invoices, resulting in a **F1 score of 81%**.
- Utilized **Microsoft Azure ML Studio** and services like AutoML, Azure Compute Instances, AKS, etc.

Machine Learning Intern @ The State University of New York at Binghamton — **June 2022 - December 2022**
- Orchestrated Drone based License Plate Recognition System on 3500+ images generated from 20 video clips self-captured using drone and self labelled for training the **Deep Learning model**.
- Utilized model architecture like **YOLOv5**, achieving **91%** accuracy of IoU in detection.

Projects

Ask My LLM: Advanced Question Answering System | *Large Language Model, Langchain, RAG, FAISS, spaCy*
- Developed an automated QA system using **Mistral-7B**, answering Israel-Hamas war queries from **37,000 web-scraped news articles** preprocessed with **spaCy**.
- Built a **RAG** pipeline with **ColBERT**-based reranking in **LangChain** for improved retrieval and response accuracy.

Dialoguify: GenAI Powered Dialogue Summarizer | *Python, Pytorch, Large Language Model, Hugging Face, RLHF*
- **Fine-tuned FLAN-T5** to summarize conversations between two individuals.
- Applied **PEFT**, specifically **LoRA**, to optimize model, achieving a **ROUGE-1 score of 40.81%**.

Lyrics based Mood Classification | *NLP, Keras, Python, Sci-kit Learn*
- Introduced **NLP-driven** mood classifier (77.08%) utilizing **CNN with word2vec embeddings**, surpassing lyric-based models.

Advancing Pneumonia Diagnosis through Deep Neural Networks | *Python, Pytorch, Transfer Learning*
- Engineered **Image Classification algorithm** for pneumonia detection from chest X-ray images, utilizing **GANs, CNNs, ResNet, and DenseNet** with **86% accuracy**.