Tulsi Rajnikant Patel

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EDUCATION

Arizona State University   August 2023 – May 2025
Masters in Computer Science – GPA 4.00   *Tempe, AZ*

Nirma University   July 2019 – May 2023
Bachelors of Technology in Computer Science and Engineering | Minor in Finance   *Ahmedabad, India*

WORK EXPERIENCE

Machine Learning Engineer Intern   July 2025 – Present
Alkermes Inc.   *Waltham, MA*

- Spearheading development of a clinical report automation **Streamlit** app using **Snowflake AI Cortex**, featuring an **AI chat assistant** that lets medical writers refine section content via **prompts**, reducing manual drafting effort by 80%.
- Designed secure **RAG** workflows with Snowflake Vector Store, leveraging **AWS S3** for intermediate data storage and model prompt testing experiments, achieving >90% summary accuracy.
- Integrated **LLMs** (Openai-gpt-5, Mistral-large2, Llama 3.1–70B) to summarize key tables/figures across 10+ sections, and containerized the cloud-native application using **Docker** for deployment on **Snowpark Container Services.**
- Conducted ad-hoc statistical analysis and predictive modeling (**Elastic Net, Random Forest, Logistic Regression**) to identify responders.

Research and Development Intern   January 2023 – May 2023
Sahajanand Technologies Private Limited   *Surat, India*

- Created a **Flask** web app for graders to upload diamond images and get automated inclusion detection results, using **DynamoDB** to store grading metadata for fast retrieval.
- Prototyped defect detection systems using **contour-based** and **segmentation** techniques in **Python**, improving inclusion identification in diamond images to 93% accuracy.
- Customized **image-processing pipelines** with **OpenCV** and **Scikit-image** to extract facet and table zones, improving region segmentation and reducing manual inspection overhead.
- Evaluated **computer vision** techniques namely Thresholding, Contours, SIFT, Watershed across 5k+ diamond images.

Undergraduate Research Intern   June 2022 – December 2022
Nirma University   *Ahmedabad, India*

- Delivered interactive **PowerBI** dashboards showcasing gender-based language patterns, contributing to a university-funded digital humanities research **project.**🔗
- Co-authored a literature **survey paper** (manuscript) reviewing **40+** research papers on gendered language in politics.
- Orchestrated a tweet analysis pipeline collecting 600k+ multilingual tweets from 523 politicians using **SNScrape,** profile-based gender tagging, and **Google Translate API.**
- Configured and trained **deep learning** models (CNN, ANN, LSTM, GRU, RNN) and **LLMs** (BERT, RoBERTa) to classify sentiment and gendered language in political discourse, achieving up to 86% accuracy.

Software Development Intern   June 2022 – August 2022
Avioryn   *Surat, India*

- Co-developed key modules for **"LivLaundry"**, a full-stack laundry logistics platform, including real-time product tracking and OTP-based user authentication using **Node.js, MongoDB,** and **2Factor API.**
- Implemented QR code generation and password recovery in **JavaScript**, streamlining product handoff and reducing manual tracking errors across partner operations.
- Collaborated with **UX designers** to build data-driven dashboards, optimizing usability for multiple user personas.

PROJECTS

AI - Powered Clinical Assistant

- Programmed a **RAG** assistant with OpenAI's **text-embedding-3-small**, semantically indexing 60K+ clinical records from MedQA dataset and deploying 1.2M+ embeddings via **MongoDB Atlas** to reduce response time.
- Leveraged **Mistral-7B-Instruct** via **vLLM** to develop HIPAA-compliant responses, accomplishing 91.5% accuracy.

Amazon ML Challenge - Product Length Prediction

- Developed a multi-channel **CNN–ANN** model with **BERT** embeddings integrating text and image features from 2M+ product listings, outperforming ML baselines **(Random Forest, XGBoost, SVM)** for warehouse optimization.
- Optimized data **preprocessing** and model tuning to improve prediction accuracy for product length estimation.

SKILLS

Programming Languages: Python, C/C++, Java, Swift, SQL, HTML, CSS, JavaScript, Golang, Prolog, Solidity
Databases and Cloud: AWS, Docker, Kubernetes, MySQL, PostgreSQL, MongoDB, Git, Spark, Hadoop, PowerBI
Frameworks: Hugging Face, vLLM, LangChain, TensorFlow, PyTorch, OpenCV, Scikit-image, Node.js, React
Courses: Cloud Computing, Database Management, Machine Learing, Software Engineering, Web Technologies