Rakshit Shah

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Summary

Data Scientist & ML Engineer with experience in building production-ready solutions across computer vision, NLP, and multimodal AI. Skilled in LLM fine-tuning, vector databases, MLOps, and cloud platforms (AWS, Azure). Published researcher in IEEE Xplore with expertise in Responsible AI and Generative AI. Currently focused on LLM-based systems, end-to-end ML pipelines, and human-centered AI applications.

Education

California State University East Bay — May 2025
MS in Computer Science — GPA: 3.74 / 4.00

AP Shah Institute of Technology, University of Mumbai, India — June 2023
Bachelor of Engineering in Computer Engineering — GPA: 8.72 / 10

Experience

Student Assistant (ML & AI Researcher and Moderator) | CSU East Bay, Computer Science Dept, Hayward, CA **Feb 2024 - Nov 2024**

- Researched and implemented a custom Neural Network from scratch, coding original bias and threshold formulas with forward and backward propagation.
- Trained YOLOv5 and YOLOv8 models on underwater image datasets for object detection, improving detection precision across multiple test cases.
- Troubleshot image preprocessing and model training issues related to YOLO, resolving bottlenecks in the training pipeline.
- Moderated junior student assistant, supporting them with BluROV setup, connection stability, and technical integration issues.

Data Collection Intern & Moderator | Sciffer Analytics Pvt. Ltd , Pune, Maharashtra, India **May 2021 - Nov 2021**

- Developed web scraping python script (BeautifulSoup, Selenium) to extract 50,000+ images for machine learning models.
- Maintained an annotation pipeline using LabelImg, resulting in a 15% improvement in YOLO model accuracy.
- Engineered ETL data pipelines using Python and Pandas, ingesting raw web data, transforming it into structured formats, and preparing it for visualization in dashboards.
- Moderated junior interns by resolving their technical issues during data collection, ensuring consistency and accuracy in dataset creation.

Technical Skills

- **Languages & Tools**: Python, SQL, Git, Linux, REST APIs, Pandas, Flask, TensorFlow, Docker, AWS (Basics), Tableau (Familiar), BeautifulSoup, Selenium
- **Systems & Platforms**: Linux/Unix (Ubuntu), Windows, MacOS
- **Visualization**: Tableau (basic), Matplotlib, Seaborn

Selected Projects

InstructAware – Generative Instructional Narration for Situational Awareness ***CSU East Bay, iLab | Dec 2024 – Present***

- Built a multimodal system combining YOLOv8, PaddleOCR, and fine-tuned LLMs (DeepSeek-R1, GPT-3.5, T5, LLaMA) to generate real-time navigational cues.
- Applied RLHF and advanced evaluation metrics (BLEURT, COMET, SBERT) to boost contextual accuracy and reduce hallucinations.
- Integrated InstructAware into an Android app-SceneSense for real-time signboard detection and text extraction powered by GPT-3.5 fine-tuned in the InstructAware project
- **Tech Stack:** YOLOv8, PaddleOCR, DeepSeek-R1, GPT-3.5, T5, LLaMA-3.2, Hugging Face Transformers, RLHF, FAISS
  - https://github.com/rakshitshah280701/InstructAware.git
  - https://github.com/rakshitshah280701/SmartSignNavigation-Android.git

Personal Portfolio Website | www.rakshitai.info

- Developed a responsive React + Tailwind portfolio with animated UI and dynamic routing to showcase AI/ML projects, research, and experience.
- Integrated a LLM-powered chatbot using personal data, with semantic search (via Faiss) and real-time Q&A support.
- Deployed the chatbot on a Hetzner Cloud server (x86 shared vCPU), optimizing compute resource usage for low-latency LLM inference. Integrated uptime routines, geolocation logic, and Slack API notifications via Next.js serverless backend..
- **Tech Stack:** React.js, Tailwind CSS, Faiss, Hugging Face LLMs, Next.js API Routes, Slack API, Hetzner Cloud API
  - https://github.com/rakshitshah280701/rakshit_chatbot_backend.git
  - https://github.com/rakshitshah280701/Portfolio.git

StockSage - AI-Powered NSE Stock Forecasting App

- Built a full-stack stock prediction platform using GRU neural networks trained on 5 years of historical NSE data with TA indicators (RSI, MACD, Bollinger Bands, ADX, etc.).
- Developed automated pipeline for model training, scaling, feature engineering, and windowing per stock symbol with safe model caching and retraining fallback.
- Integrated REST APIs for market tickers, NIFTY50 gainers/losers, and multi-source financial news aggregation (APIs + web scraping).
- Packaged app into a cross-platform desktop client using PyInstaller and implemented UI-triggered prediction logic with next-trading-day awareness.
- **Tech Stack:** Flask, TensorFlow (GRU), yFinance, TA-lib, Pandas, PyInstaller, REST API, HTML/CSS/JS
  - https://github.com/rakshitshah280701/StockSage.git

Vital Organ Health Prediction ***AP Shah Institute of Technology, Mumbai University | Jan 2023-April 2023***

- Built a Flask-based diagnostic tool predicting heart and organ health from ECG images, heartbeat audio, and patient data.
- Trained Random Forest and CNN models using MFCC-extracted features (via `librosa`) and deployed them as `.pkl` and `.h5` for real-time inference.
- Integrated Jinja2 templates and result rendering for interactive web UI.
- **Tech Stack:** Flask, scikit-learn, TensorFlow/Keras, librosa, OpenCV, Jinja2
  - https://github.com/rakshitshah280701/Vital-Organ-HealthPredictor.git

Research Paper

1. Linear Regression vs LSTM for Time Series Data — Paper Link- https://ieeexplore.ieee.org/document/9848887
2. Heartbeat prediction using Mel Spectrogram and MFCC value — Paper Link- https://ieeexplore.ieee.org/document/10150129