

# RAKSHIT SHAH

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## SUMMARY

Data Scientist & Machine Learning Engineer with a strong foundation in Python, TensorFlow, PyTorch, and cloud computing (AWS, Azure). Experienced in developing predictive models, NLP applications, and computer vision solutions. Adept at handling large datasets, deploying ML models, and leveraging AI for business intelligence. Published research in IEEE Xplore on Time Series Analysis and Audio Signal Processing. Passionate about Responsible AI and Explainable AI (XAI). Seeking to leverage skills in Data Science, MLOps, and NLP in a dynamic organization. Specialized in Generative AI, Large Language Models (LLMs), and multimodal AI. Experienced in prompt engineering, model fine-tuning, and deploying AI systems at scale.

## EDUCATION

### California State University East Bay

MS in Computer Science

Expected Graduation: May 2025

GPA: 3.74 / 4.00

### AP Shah Institute of Technology, University of Mumbai, India

Bachelor of Engineering in Computer Engineering

June 2023

GPA: 8.72 / 10

## TECHNICAL SKILLS

**Programming:** Python, R, SQL, Java, C++

**Machine Learning:** Supervised & Unsupervised Learning, Regression, Classification, Clustering, Decision Trees, Random Forest

**Deep Learning & NLP:** TensorFlow, PyTorch, Keras, Transformers, LLMs (T5, GPT-3.5, LLaMA), Hugging Face, NLTK, OpenCV, YOLO

**Big Data & Cloud:** AWS, Microsoft Azure(OpenAI services), Hadoop, Spark, Databricks, Snowflake,

**Vector Databases & RAG:** FAISS, Pinecone, ChromaDB

**Data Visualization:** Tableau, Power BI, Seaborn, Matplotlib, Plotly

**MLOps & Deployment:** Docker, Kubernetes, FastAPI, Flask, Streamlit, CI/CD Pipelines, Model Versioning, Model Monitoring, API Deployment

**Databases:** MySQL, PostgreSQL, MongoDB, Firebase

**AI Services & APIs:** OpenAI API, Anthropic Claude, Hugging Face Models, Google Vertex AI, LangChain

## EXPERIENCE

### Student Assistant (ML & AI Researcher) | CSU East Bay, Computer Science Dept.

Feb 2024 - Nov 2024

- ❖ Researched & implemented custom Neural Network from scratch implementing custom formulas for bias and threshold and implemented forward and backward propagation for the neural network.
- ❖ Worked with Underwater image dataset and trained YOLOv5 and YOLOv8 models for object detection.
- ❖ Worked with BluROV underwater robot navigation and implemented a script to fetch frames from video footage for object detection.

### Data Collection Intern | Sciffer Analytics Pvt. Ltd

May 2021 - Nov 2021

- ❖ Developed web scraping tools (BeautifulSoup, Selenium) to extract 50,000+ images, ensuring high-quality dataset generation for machine learning models.
- ❖ Designed YOLO annotation pipeline using LabelImg, contributing to a 15% improvement in model accuracy.
- ❖ Built automated data pipelines with Python & Pandas, streamlining data storage and preprocessing.
- ❖ Optimized Python scripts for data cleaning, visualization, and video frame extraction, accelerating workflow efficiency by 30%.

## VOLUNTEER EXPERIENCE

### IEEE Volunteer

Aug 2019 - Nov 2023

- ❖ Served as Chairperson (2022-2023) and Vice Chair (2021) at IEEE APSIT Student Branch, leading initiatives and fostering professional growth.
- ❖ Actively volunteered at IEEE REGION 10 SYMPOSIUM and contributed to the Bombay Section Student Activities Committee from 2020 to 2022.
- ❖ Design Lead for IEEE Bombay Section SAC, enhancing event engagement through visual content.

## SELECTED PROJECTS

### InstructAware – Generative Instructional Narration for Situational Awareness

*California State University East Bay, iLab | Dec 2024 – Present*

- ❖ Developed a Transformer-based scene understanding model trained on Bounding Box Coordinates and OCR Text to predict narratives for low-vision individuals, enhancing situational awareness.
- ❖ Integrated LLM fine-tuning and reinforcement learning from human feedback (RLHF) to improve contextual narrative accuracy.
- ❖ Utilized retrieval-augmented generation (RAG) to enhance knowledge-based responses.
- ❖ Retrained DeepSeek-R1, GPT3.5, T5, and LLaMA-3.2 to generate context-aware instructional descriptions of detected objects and signs in urban environments.
- ❖ Implemented YOLOv8 for object detection and Paddle-OCR for text extraction, feeding outputs into the LLM pipeline to produce meaningful NLP scene interpretations.
- ❖ Engineered a multi-track model, integrating spatial relationships between detected objects to generate structured narratives for navigation assistance.
- ❖ Optimized model performance with BLEURT, METEOR, COMET and SBERT+Cosine scoring to refine instructional text accuracy.

### Research Paper Summarizer (NLP & LLMs)

- ❖ Developed a web application that uses a Large Language Model (LLM) to summarize research papers. The application aims to streamline the process of extracting essential information from academic papers and enhance user engagement with the material.
- ❖ Leveraged Hugging Face's T5 model for advanced text summarization, enabling concise and accurate summaries of lengthy academic papers.
- ❖ Utilized regex to effectively extract and clean specific sections like Abstract and Conclusion from the text.
- ❖ Implemented an interactive interface for users to upload PDFs, view generated summaries, and query the content for deeper engagement.

### Sign Detection Android App

*California State University East Bay, iLab | Oct 2024 – Dec 2024*

- ❖ Designed and developed a real-time signboard detection Android application using Java, OpenCV, and TensorFlow Lite model of YOLOv8 trained on Shop signs, Traffic signs and Advertisement signs.
- ❖ Implemented bounding box detection algorithms to highlight and extract text from scanned signboards.
- ❖ Built an intuitive camera-based UI for seamless interaction and signboard identification.

### Vital Organ Health Prediction

*AP Shah Institute of Technology, Mumbai University | Jan 2023-April 2023*

- ❖ Heart Health Analysis: Applied Convolutional Neural Networks (CNNs) to classify heart health from audio recordings utilizing Python and machine learning libraries like Librosa and Keras.
- ❖ Medical Report Analytics: Implemented logistic regression to interpret health data from reports employing pandas and matplotlib for data manipulation and visualization.
- ❖ Image Classification for Diagnosis: Developed a model using random forests to classify medical images, integrated into a Flask web application for interactive user feedback.

## RESEARCH PAPER

1. Linear Regression vs LSTM for Time Series Data
2. Heartbeat prediction using Mel Spectrogram and MFCC value

Paper Link- <https://ieeexplore.ieee.org/document/9848887>

Paper Link- <https://ieeexplore.ieee.org/document/10150129>