Twisha Patel

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Summary

Passionate and versatile Software Engineer with hands-on experience in AI/ML, object detection, large language models, and speech-to-text technologies. Skilled in Python and open-source frameworks, with a strong track record in building real-world solutions—ranging from finance-specific LLMs and real-time object detection to machine data integration and speech transcription pipelines. Eager to leverage cutting-edge AI methods to solve impactful problems.

Education

ITM SLS Baroda University, Vadodara, Gujarat *Aug 2021 – May 2025*
Bachelor's Degree in Computer Science — CGPA: 8.6/10

Shri J.R Shah Bright English Medium School, Vadodara, Gujarat *June 2020 – July 2021*
Higher Secondary School — Grade: B2

Bright School, Vadodara, Gujarat *June 2019 – March 2020*
Secondary School — Grade: B1

Experience

Jr. Python Developer *July 2025 – Present*
Sundaram Technologies, Vadodara, India

- Working on object detection and computer vision projects for industrial automation.
- Developing Python-based ML and deep learning solutions for image/video analysis.
- Responsible for data analysis, preprocessing, and model evaluation to enhance detection accuracy.
- Leveraging frameworks such as TensorFlow, OpenCV, and PyTorch for real-world vision applications.

AI/ML Intern *Jan 2025 – July 2025*
Artem Health Tech, Ahmedabad, India

- Developed a machine integration solution to sync machine data directly with the company portal, streamlining data flow and automation.
- Implemented real-time object detection using MMDetection's RTMDet-tiny model on live webcam feeds.
- Built a speech-to-text pipeline leveraging open source models with agentic behaviour.
- Fine-tuned a finance-specific LLM using Flan-T5, curated financial datasets, and optimized prompt engineering for precise responses.

Skills

Programming Languages: Python, JavaScript, PHP, SQL, Bash
Web Technologies: HTML5, CSS3, Bootstrap, jQuery, REST APIs
Databases: MySQL, SQLite
Frameworks/Libraries: TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, Hugging Face, Transformers, Pandas, NumPy, Matplotlib, Seaborn, Streamlit, FastAPI
Machine Learning/AI: Deep Learning, NLP, Computer Vision, Transfer Learning, Model Explainability (GradCAM, SHAP), Hyperparameter Tuning, Human-in-the-Loop AI
Large Language Models: Fine-tuning, Prompt Engineering, Model Deployment, Custom Q&A Solutions
Tools/Platforms: Git, Docker, GitHub Actions, CI/CD Pipeline, VS Code, Jupyter Notebooks, Google Colab
Other: Data Visualization, Exploratory Data Analysis, Report Generation (CSV, PDF, JSON), Batch Processing, API Integration, Research Documentation

Projects

Pneumonia Detector AI

- Built an interactive, explainable AI system for automated pneumonia detection in chest X-rays using EfficientNet, PyTorch, and Streamlit, achieving high accuracy and model transparency through GradCAM visualizations.
- Engineered a robust human-in-the-loop workflow, enabling real-time user feedback, automated retraining, image quality checks, and session/audit logging to drive continual model improvement and accountability.
- Delivered a production-ready, privacy-first solution with batch analysis, downloadable reports (CSV, PDF, JSON, FHIR), and full Docker support for seamless deployment in research and clinical settings.

AutoML Pipeline Service

- Designed and deployed an end-to-end AutoML pipeline service using Streamlit and FastAPI for dynamic model training, inference, and benchmarking via web interface.
- Automated dataset profiling, model selection, versioning, and performance logging with configurable settings and retention policies.

Object Detection with MMDetection

- Implemented a real-time object detection system using MMDetection's RTMDet-tiny model and OpenCV to process webcam video.
- Displayed live bounding boxes and class labels on detected objects using pretrained COCO weights.
- Gained hands-on experience with MMDetection's API, model inference workflow, and visual result rendering.

Traffic Sign Recognition

- Developed and trained a deep learning model in Python to accurately classify German traffic signs using the GTSRB dataset.
- Utilized OpenCV for advanced image preprocessing and data augmentation to enhance model robustness.
- Built and fine-tuned a convolutional neural network (CNN) using TensorFlow and Keras, achieving high classification accuracy on the test set.

Voice Assistant

- Developed a desktop voice assistant in Python capable of recognizing and executing user voice commands for tasks like setting reminders, playing music, and web searches.
- Integrated speech recognition and text-to-speech (TTS) libraries to enable seamless two-way human-computer interaction.
- Enhanced natural language understanding for more accurate and flexible command processing.

Finance Based Small LLM

- Fine-tuned Flan-T5 on curated financial datasets for enhanced finance-specific Q&A.
- Applied prompt engineering and optimization to improve query accuracy and contextual relevance.