

Mihir Mandavia

AI/ML Engineer | RL & LLM Systems

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EDUCATION

GLS University

B.Tech in Computer Science and Engineering, CGPA: 7.2 (Pursuing)

Ahmedabad

2023 – 2027

EXPERIENCE

Technical Lead

Mar 2024 – Present

Dipti Shah's Institute of English, Public Speaking and Self-Development (Remote, Part-time)

Ahmedabad, GJ

- Organized courses, batches, and events for 100+ students; created instructional materials and coordinated corporate training programs.

PROJECTS

The Snitch: OpenEnv AI Oversight Env | *Python, PyTorch, TRL, PEFT, Docker*

Meta x Scaler 2026

- Built an OpenEnv-compliant RL environment where an overseer LLM classifies another agent's tool-use trace as honest, reward-hacking, lazy, or deceptive, and must cite the specific trace step that revealed the misbehavior, with a gaming-hardened reward function.
- Established a frontier-model leaderboard (GPT-4o, GPT-4o-mini, Llama-3.1-8B, Qwen2.5-7B): across 275 correctly-classified misbehavior traces, none grounded their verdicts to the correct trace step, demonstrating that classification and step-localized grounding are separate skills.
- Trained a 1.5B Qwen LoRA via GRPO (TRL) on the env's grounded reward; captured both class and step on 34 of 61 misbehavior traces, the smallest model on the leaderboard and the only one with non-zero grounding.
- Shipped a live OpenEnv server on Hugging Face Spaces with reproducibility scripts, statistical analysis (Wilson CIs, two-proportion z-test, $p=0.0017$), and 44 passing tests.

Optical-Guided Super-Resolution for Thermal Imagery | *Python, PyTorch, OpenCV, NumPy*

SIH 2025

- Engineered a DualEDSR deep learning pipeline to enhance low-resolution ISRO thermal satellite imagery using high-resolution optical images as guidance, supporting both single-channel and RGB thermal inputs.
- Improved reconstruction fidelity (PSNR) over baseline super-resolution by leveraging cross-modal feature fusion between optical and thermal domains, with an optimized inference pipeline for edge deployment.
- Qualified for Smart India Hackathon 2025 Grand Finale, selected from 500+ teams nationwide.

RailVision AI: Real-time Edge AI for Railway Wagon Inspection | *Python, YOLOv8, EasyOCR, ONNX, Streamlit*

- Built a full computer vision pipeline for automated wagon detection and classification from high-speed, low-light video footage, integrating motion counting, adaptive deblurring, and low-light enhancement.
- Deployed EasyOCR for real-time wagon ID and marking extraction from video frames; exported model to ONNX for optimized edge inference with sub-100ms latency.
- Delivered an interactive Streamlit monitoring dashboard with live detection feed, OCR output, and wagon count metrics.

PDF Document Intelligence | *Python, FastAPI, Streamlit, GPT-4o-mini, PyMuPDF, OCR*

- Developed a multi-document AI analysis system that extracts and indexes text from uploaded PDFs via PyMuPDF with OCR fallback, enabling natural language Q&A over document content using GPT-4o-mini.
- Implemented auto-summarization, topic tagging, and document classification as structured outputs; designed a FastAPI backend with Streamlit frontend supporting concurrent multi-document sessions.
- Engineered a retrieval pipeline with context-window management to handle large documents accurately across multi-turn conversations.

AI-Powered Forensic Email Retrieval System | *Python, LLMs, n8n, Gmail API*

- Designed an end-to-end agentic pipeline that uses LLM-based intent parsing to extract structured search parameters from natural language queries, routing them through n8n workflows into the Gmail API.
- Retrieves matched emails and exports them as forensically intact .eml files packaged in a ZIP archive, with structured audit logging of each query and its resolved parameters.

ACHIEVEMENTS

- Meta x Scaler School of Technology OpenEnv Hackathon 2026 - Top 100 out of 32,000+ teams; built “The Snitch” OpenEnv environment for AI oversight with frontier-LLM leaderboard and trained 1.5B GRPO+LoRA overseer.
- Smart India Hackathon 2025 - Grand Finalist, selected from 500+ teams nationally for ISRO thermal imagery problem statement.
- Adani AIDTM Hackathon 2026 - Developed production-grade Edge AI railway inspection system in a competitive 24-hour sprint.
- 1st Prize, Tech Teaser (IT Quiz), Cyber Shadez National Tech Event, GLS University.

TECHNICAL SKILLS

Languages: Python, C++, SQL, JavaScript

AI / ML: Reinforcement Learning, RL Environments (OpenEnv), GRPO, LoRA Fine-tuning, LLMs, Deep Learning, Computer Vision, CNNs, RAG, Image Processing

Libraries / Frameworks: PyTorch, Hugging Face TRL, PEFT, Transformers, OpenCV, YOLOv8, EasyOCR, ONNX Runtime, NumPy, FastAPI, Streamlit, React

Developer Tools: Git, GitHub, Docker, Postman, VS Code, n8n

Databases and Web: MySQL, PostgreSQL, SQLite, HTML, CSS

Core CS: Data Structures and Algorithms, OOP, DBMS, Operating Systems