ANVI PANCHAL

AI/ML and Full Stack Engineer | UI/UX Design | Space Data Science

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Profile

Final-year Computer Science engineer who turns AI research into products people can use, across models, full-stack engineering and interface design. **First author** of one of **two marsquake papers accepted by Springer Nature journals**, both built on research as an **AI/ML Research Intern at the Indian Space Research Organisation (ISRO)**. **Smart India Hackathon 2025 National Winner**, **5th at TetraTHON 2026** (Indo-French AI Innovation Sprint), and co-applicant on **three design patents** filed with the Indian Patent Office, one already accepted for registration.

Education

GLS University, Faculty of Engineering and Technology, Ahmedabad — Jun 2023 - May 2027
Bachelor of Technology in Computer Science and Engineering — *SGPA: 8.64/10 (Semester 6)*

Internship Experience

AI/ML Research Intern | Certificate — May 2026 - Aug 2026
Indian Space Research Organisation (ISRO) — *Ahmedabad, on-site*

- Ran **130+ GPU training experiments** on Kaggle to develop deep learning models for **planetary seismology**, using seismic data from **NASA InSight** (Mars), **Chandrayaan-3 ILSA** (Moon) and the **Apollo** missions (Moon).
- Developed a **hybrid convolutional and Fourier neural operator (FNO)** architecture that finds marsquakes in raw waveforms and sorts them into frequency families from spectrograms, which led to **two accepted research papers**.
- Prepared **Chandrayaan-3 ILSA** data with preprocessing pipelines for four lunar seismic event classes (rover movement, APXS, ChaSTE and natural events), validated against published event catalogues.

AI & Backend Engineering Intern | Certificate — Jun 2025 - Jul 2025
The Line Tech Solutions Ltd, United Kingdom — *Remote*

- Automated order handling in the **Nishan Order Management System** with **AI agents** and **Django APIs**.
- Connected **Tally Prime Gold** data via REST APIs, built **live financial dashboards** and automated workflows in **n8n**.

Dynamics 365 CRM Functional Consultant Intern — Nov 2024 - Dec 2024
Burhani Managed IT Services, Dubai, UAE — *Remote*

- Built an **HR leave and attendance solution** in **Dynamics 365** and **Power Apps**, with payroll deductions tied to leave.
- Implemented **location-based check-in**, live hours tracking and a timesheet and task tracker, and assessed a customer portal's feasibility.

Microsoft Power Apps Intern | Certificate — Jul 2024 - Aug 2024
Lalit Rakesh & Associates — *Remote*

- Delivered a **task management system with role-based access** on Power Apps, Dataverse, SharePoint and Power Automate.
- Let tasks pass to a colleague **during leave** with their full conversation history, and added one view of every task's status.

Software Development Intern | Certificate — May 2024 - Jun 2024
Hindustan Platinum Pvt. Ltd. — *Remote*

- Wrote a **Flask** service that tracks networked weighing machines in real time through ping checks, **sockets** and **multithreading**.
- Added **automatic email alerts** after an hour offline, and deployed the service on the company's internal server.

Publications

Marsquake Detection from Raw InSight Waveforms with a Hybrid Convolutional and Fourier Neural Operator
Anvi Panchal, Yash Shah, Madhuri Chopade. *Cureus Journal of AI-Augmented Research*, Springer Nature. Accepted for publication, DOI awaited

- Detects marsquakes directly in raw seismometer waveforms with a hybrid model, scoring **95.20% ROC-AUC** on the held-out test set and **83.88% ROC-AUC** on 751 external MarsQuakeNet clips.

Frequency-Family Classification of Marsquakes from Spectrograms with a Hybrid Convolutional and Fourier Neural Operator
Yash Shah, **Anvi Panchal**, Madhuri Chopade. *Education and Information Technologies*, Springer Nature (Q1, Web of Science and Scopus, Impact Factor 7.2). Accepted for publication, DOI awaited

- Sorts marsquakes into all six Marsquake Service event types from NASA InSight spectrograms, to our knowledge **the first supervised model to do so**, with **99.50% frequency-family accuracy** and **79.60% six-type accuracy** on the held-out test set, where **40 of 41 six-type errors** stayed in the correct family.

Causal and Counterfactual Reasoning for Conflict-Aware Multimodal Sentiment Analysis
Yash Shah, **Anvi Panchal**, Madhuri Chopade. *Under process*

Key Projects

Coast Scan | National Winner, Smart India Hackathon 2025 | Lab Report — Sep 2025 - Dec 2025

- Created a **low-cost handheld device** with a closed black chamber, a Raspberry Pi camera and environmental sensors that images beach sand and shows grain size distribution and sediment type on a **live dashboard**.
- Measured individual sand grains with an **image processing pipeline** of thresholding, contour detection and morphological operations, and tested **CNN models** for recognising grain patterns.

- Matched laboratory sieve analysis with **98% agreement on D50 grain size** (median grain diameter), turning **days of lab work into an automatic report in seconds**. The project is incubated at **GLS LEAF**.

Stack: *Raspberry Pi, IoT sensors, Python, OpenCV, NumPy, CNNs, Matplotlib, Django, AWS*

Urja Setu | Top 50, SSIP Vikas Saptah Hackathon 2025 | Project Page — Sep 2025 - Oct 2025

- Designed and built a **Flutter** citizen app and a **React** dashboard for technicians and administrators, with analytics and PDF reports, on a **headless Django REST Framework** backend with role-based access.
- Fine-tuned **YOLOv8s** on a custom dataset for **GUVNL**, Gujarat's power utility, to detect **seven classes** of grid assets and hazards (electric poles, transformers, insulators, street lights, meters, wiring and vegetation overgrowth).
- Kept uploads instant with **background-thread detection** and a **rule engine** that assigns the issue type and crew action.

Stack: *Flutter, React, JavaScript, Django REST Framework, Python, Ultralytics YOLOv8, PyTorch, SQLite, OpenStreetMap*

EduBridge AI | 5th Place, **TetraTHON 2026**, Indo-French AI Innovation Sprint | Project Page — Jul 2026 - Aug 2026

- Built a real-time lecture companion that explains a **live English lecture in each student's own language** and level.
- Streamed audio over **WebSockets** into a pipeline that transcribes speech, **detects technical terms locally** and infers the subject from a rolling window of the lecture.
- Made it dependable with **automatic failover between AI providers**, **155 unit tests** and **20 end-to-end Playwright tests**.

Stack: *React 19, TypeScript, WebSockets, Node.js, Fastify, LLMs (Groq, Cerebras), Sarvam AI, Playwright, AWS Lightsail, Caddy*

BiteKaro | Capstone Project, scored 99/100 | Project Page — Jul 2025 - Apr 2026

- Delivered an **AI-powered self-ordering kiosk** for cafes, with cart, **Razorpay** payments, loyalty points and an admin dashboard for sales analytics, updated live over **Socket.io**.
- Built a **hybrid menu recommender** blending Apriori rules, **SVD collaborative filtering** and time-of-day popularity.

Stack: *Tailwind CSS, Node.js, Express, Socket.io, Python, FastAPI, scikit-learn, SciPy, pandas, Matplotlib, PostgreSQL, Razorpay*

Honours and Awards

Smart India Hackathon 2025 (Hardware Edition), National Winner | Certificate — Dec 2025
Only Gujarat team among the national winners, from **68,766 teams**, with **INR 1.5 lakh** and an Ahmedabad Mirror feature.

TetraTHON 2026, Indo-French AI Innovation Sprint, 5th Place, among **44 finalist teams** | Certificate — Aug 2026

SSIP Vikas Saptah Hackathon 2025, Top 50 Finalist, from **4,000+ teams** across Gujarat | Certificate — Oct 2025

HackHound 3.0, National Finalist, Certificate of Achievement, SRM IST, Delhi NCR | Certificate — Feb 2025

Singapore India Hackathon 2026, Selected, AICTE and Ministry of Education, event ongoing — Oct 2026

Intellectual Property

Co-applicant on three **design patents** filed with the Indian Patent Office (Oct 2026) for the **Portable Sediment Grain Size Analysis Device** (Coast Scan), **Portable Soil Moisture Meter** and **Compact Soil Moisture Monitoring Device**. The **Portable Soil Moisture Meter** design (first applicant) is **accepted for registration**, with its certificate in progress (Acceptance Status).

Skills

Languages	Python, TypeScript, JavaScript, Java, C, C++, SQL, Bash scripting
AI and Deep Learning	PyTorch, TensorFlow, Keras, CNNs, Fourier Neural Operators, scikit-learn, recommender systems
Vision, NLP and LLMs	Computer Vision, Ultralytics YOLOv8, OpenCV, NLP, Large Language Models, Gemini API, Groq API, LangChain, AI agents, prompt engineering
Frontend and Mobile	React, Flutter, Tailwind CSS, HTML, CSS, WebSockets
Product Design	Figma, wireframing, prototyping, responsive design
Backend and APIs	Django, Django REST Framework, FastAPI, Flask, Node.js, Express, Fastify, Celery, Kafka
Data Stores	PostgreSQL (pgvector), MySQL, SQLite, MongoDB, Redis, Elasticsearch
Cloud and DevOps	AWS, DigitalOcean, Docker, GitHub Actions, Caddy, Linux, Kaggle
Automation Tools	n8n, Power Apps, Power Automate, Dataverse, SharePoint, Dynamics 365
Scientific Python	NumPy, pandas, SciPy, Matplotlib, ObsPy, SeisBench
Hardware and IoT	Raspberry Pi, ESP32, sensor integration
Spoken Languages	English, Hindi, Gujarati, German (currently learning)

Certifications and Training

Oracle Cloud Infrastructure 2025 Certified AI Foundations Associate, Oracle, score 98% | Certificate — Oct 2025
Deep Learning: Beginner to Advanced, Codebasics | Certificate — Sep 2026
Agile Scrum Master, Simplilearn | Certificate — Jul 2026
IDE Bootcamp Edition 3, Phase 1, MoE's Innovation Cell and AICTE | Certificate — Apr 2026

A five-day residential bootcamp at GITAM Bengaluru, where Coast Scan was presented to the jury. Coast Scan is incubated at GLS LEAF.

Leadership and Campus Involvement

- **Co-founded Ink and Imagination**, the GLS University literary club, and organised **ECHO**, the department's first literary event, for **300+ students**.
- **Coordinator of CyberShadez**, the national-level technical event of the B.Tech CSE department at GLS University.
- **Techno Games Champions** at GLS Youth Festival 2026, with **1st place in Treasure Hunt** (404: Treasure Not Found).
- **IEEE Student Member.**