

Pratham Arora

+91-9810855594 | pratham3992@gmail.com | linkedin.com/in/pratham3992arora | github.com/prats3992 | pratham-arora.vercel.app

Education

Plaksha University

B.Tech. in Computer Science & AI

Mohali, India | Expected Aug. 2026

CGPA: 8.20 / 10.0

Research Experience

Undergraduate Researcher

Jan. 2026 – Present

Visual Benchmarking of VLMs | Sup. Prof. Pankaj Pansari | Plaksha University

- Constructing a 500-image benchmark dataset across five physical estimation tasks (weight, volume, angle, fit, structural stability) with instrument-verified ground truth to evaluate frontier VLMs on physical-world grounding under naturalistic conditions.
- Preliminary evaluation across 200 images: **Gemini 3 Pro** achieves 21.57% MAPE on angle estimation vs. 28.99% for GPT-5.2; both models score near chance (0.476) on structural stability, identifying an unsolved failure mode in frontier VLMs.

Undergraduate Researcher

June 2023 – Aug. 2023

Sup. Prof. Sandeep Manjanna | Plaksha University

- Developed preprocessing pipeline (contrast adjustment, noise reduction, edge detection) to optimise **Segment Anything Model (SAM)** for agricultural crop-weed segmentation on sparse datasets; improved batch throughput for **10,000+ images** via vectorized NumPy and multiprocessing.

Industry Experience

AI Engineering Intern

June 2025 – July 2025

Cotality (PropTech SaaS) | Kolkata

- Architected **FastAPI** backend parsing **50,000+ LOC/day** across 15+ languages via AST analysis, enabling automated real-time documentation generation across polyglot codebases.
- Reduced AI embedding generation costs by **85%** by designing a hash-based change detection system with **SHA-256 on AST nodes**, chunking codebases function-by-function and skipping unchanged functions to eliminate redundant vector database updates.
- Built **RAG pipeline** using LangChain, Azure OpenAI embeddings, and Cosmos DB with DiskANN vector search for semantic code retrieval; migrated from FAISS as retrieval latency requirements tightened with repository growth.

Technical Projects

VR LLM Conversational Agent | Unity, Gemini API, Google Cloud STT/TTS

Aug. 2025 – Dec. 2025

- Engineered a real-time VR conversational agent integrating **Gemini 2.5 Flash** with Google Cloud STT/TTS, achieving average response latency of **1.8s** through parallel API calls, caching, and audio preprocessing.
- Designed **within-subjects experimental study** ($N = 18$) evaluating three latency feedback mechanisms (embodied gestures, visual indicators, verbal fillers) on perceived animacy and immersion via Godspeed questionnaire.
- Proved via **Wilcoxon signed-rank test** ($p < 0.05$) that embodied gestures significantly outperform visual loading indicators; **co-authored paper submitted to MIT's Presence journal** (under review).

Kelp Forest Semantic Segmentation | PyTorch, U-Net

Jan. 2024 – May 2024

- Achieved **Top 100 finish (top 17%)** in a DrivenData satellite imagery competition using **U-Net with EfficientNet-B3** backbone for kelp forest segmentation in noisy real-world imagery.
- Built streak-detection pipeline using an ensemble of **CNN classifiers** (ResNet, DenseNet) with hard voting to filter atmospherically corrupted training images, achieving **F1 score of 0.952**.

Leadership & Involvement

Head of Technology

Apr. 2025 – Feb. 2026

Athleda – Plaksha Sports Society | Plaksha University

- Built and maintained a sports platform serving **500+ students**, shipping event registration, live-scoring, and photo galleries, while mentoring 2 junior developers through code reviews and production deployments.

LEAP.AI @ Plaksha

Feb. 2024 – Feb. 2025

Web Developer → Head of Web Development | Plaksha University

- Led a team of 7–8 through **2 full platform redesigns** as Head of Web Development, growing the AI club site to **800+ monthly users** for events, workshops, and project showcases.

Skills

AI/ML: PyTorch, LangChain, RAG Pipelines, Segment Anything (SAM), OpenCV

Languages: Python, SQL, JavaScript, TypeScript

Cloud & Data: Azure (Cosmos DB, OpenAI), Firebase, FAISS, Google Cloud

Engineering: FastAPI, Node.js, Next.js, REST APIs, Git/GitHub, Vercel