

# DHANANJAY AGNIHOTRI

AI Engineer | Computer Vision | LLM | RAG

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## SUMMARY

AI Engineer specializing in Computer Vision, LLMs, and RAG systems, with hands-on experience designing and deploying end-to-end AI platforms for education, construction, and document intelligence. Proven expertise in handwritten OCR, automated grading systems, blueprint analysis, and AI agents that combine vision models with large language models for real-world decision-making. Strong background in system design, scalable inference, and explainable AI, with a track record of translating complex AI research into production-ready solutions.

## EXPERIENCE

### AI Engineer II

**Infutrix**

10/2025 Present Mohali, India

- Developed an AI-driven handwritten OCR and automated grading platform for educational institutions, enabling extraction and grading of handwritten answers from scanned exam sheets using Computer Vision, OCR, and LLMs.
- Designed and implemented end-to-end CV-LLM pipelines for handwriting recognition, layout analysis, and answer normalization, with scalable inference-ready architecture for real-world academic deployments.
- Built rubric-aware grading logic and explainable AI feedback modules that evaluated student responses, supported partial credit, and reduced manual grading costs by ~80% ( $\text{₹}2 \rightarrow \text{₹}0.4$  per answer-sheet page).

### AI Engineer II

**DoAZ**

12/2024 10/2025 Seoul, South Korea

- Developed an AI-powered agent for Geotechnical Report Analysis, automating borehole log extraction (soil data, depths, SPT/N-values, elevations) from PDFs using OCR, VLLM, and Computer Vision.
- Fine-tuned VLMs/LLMs for geotechnical data extraction and deployed models on Vast.ai and RunPod for scalable inference.
- Built 2D/3D borehole visualizations and an AI-based judgement module that provided insights on soil classification, foundation recommendations, and geotechnical calculations—reducing manual analysis time for engineers.
- Built MetaDraw, an AI system for construction blueprint management, enabling natural language queries on drawing content, project metadata, and layout details.
- Implemented layout parsing, OCR, and VLMs for metadata extraction, created a vector database, and deployed hybrid semantic search, streamlining blueprint retrieval for engineers.

### AI Engineer

**DoAZ**

06/2024 12/2024 Seoul, South Korea

- Developed a computer vision model to detect missing insulation in construction blueprints, optimizing preprocessing, annotation strategies, and model architecture to achieve 95% accuracy.
- Designed algorithms for fire safety symbol detection, floor area calculation, and floor plan name extraction, combining template matching and OCR techniques for large-scale blueprint analysis.
- Created data labeling guidelines and built scalable model pipelines to support robust construction blueprint analysis workflows.

## Academic PORs

### Vice Lead | Software Subsystem

06/2023 06/2024

Mumbai, India

**Team Rakshak, IIT Bombay**

- Led a 10-member robotics & AI team, mentoring peers in deep learning and computer vision for national/international competitions.

### Junior Engineer | Software Subsystem

05/2022 06/2023

Mumbai, India

**Team Rakshak, IIT Bombay**

- Researched CNN architectures (YOLO, VGG, ResNet, Inception) and built recognition models (98.6% accuracy with VGG16); represented IIT Bombay at SUAS international competition (AUVSI, Maryland)

## EDUCATION

### Bachelor of Technology (B.Tech)

**IIT Bombay**

08/2020 08/2024

### Research Work

#### Inscanner: Dual-Phase Detection and Classification of Auxiliary Insulation Using YOLOv8 Models

2025

<https://arxiv.org/abs/2502.18871>

AI solution for missing insulation in construction blueprints

## PROJECTS

### Smart Scheduler Agent

06/2025 06/2025

- Developed Smart Scheduler AI Agent, a voice-enabled meeting assistant integrating Google Calendar with natural language scheduling; built with FastAPI + React, used Gemini LLM for intent extraction, Whisper for speech-to-text, OpenAI TTS for voice responses, and deployed with Google OAuth2 authentication for secure per-user calendar access.

### Gesture Controlled Drone

06/2022 08/2022

- Created a Neural Network model for recognizing hand gestures utilizing the MediaPipe hands library
- Implemented python code for mapping drone controls and controlling drone using onboard camera feed
- Prepared a face detection model along with PID control system to direct the drone to follow command

### EchoMind – Personal AI for Document Chat

03/2025 05/2025

- Built a full-stack AI Chatbot using FastAPI and Streamlit that allows users to upload .pdf, .txt, or .docx files and engage in context-aware conversations powered by Gemini and RAG; features a responsive UI, modular backend, and dynamic document management via AWS S3.
- Integrated LlamaIndex, FAISS, and Sentence Transformers for intelligent parsing and fast semantic search, with a hybrid query engine that classifies user intent for seamless switching between document retrieval and general AI chat.

## TRAINING / COURSES

- Data Structures and Algorithms Specialization**
- Google Data Analyst Professional Certificate**
- Deep Learning Specialization, Andrew NG**
- Machine Learning Specialization, Andrew NG**

## SKILLS

### Core AI & ML

- CV (Detection, Segmentation, OCR, Layout Parsing)
- End-to-End CV-LLM Pipeline Design, LLMs, RAG
- LLM&VLM finetuning, SFT, RFT, GRPO

### Frameworks & Libraries

- PyTorch, TensorFlow, Langchain, OpenCV, FAISS
- Transformer, LlamaIndex, Sentence Transformers
- OpenAI API, Gemini API, vLLM, Hugging Face, YOLO
- HOCR & Document Parsing, LLMs, VLMs, RAG

### Backend, APIs & Deployment

- AWS , FastAPI, Vast.ai, RunPod (GPU Inference)
- GCP, Streamlit, CI/CD, Docker, Cloudflare