

# Swapnil Dutta

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## WORK EXPERIENCE

### Anonymous Digital Marketing Pvt Ltd.

Full Stack Engineer

Kolkata, India

Jun 2024 – Aug 2024

- Engineered a robust web application for employee management and fraud prevention that decreased employee fraud while enhancing onboarding efficiency across more than 50 businesses in the F&B sector.
- Architected and maintained a scalable cloud infrastructure on AWS (EC2, S3, Lambda, SES) that facilitated seamless integration with Docker and GitHub CI/CD tools, significantly reducing deployment times.

### ADRDE, DRDO (Research & Development)

Agra, India

Machine Learning Intern

May 2024 – Jul 2024

- Aggregated and analyzed 50TB of 4-dimensional weather data from ECMWF ERA5, MERRA-2, and NCAR using Xarray and Dask, resulting in the identification of over 20 significant weather patterns through dynamic visualizations crafted with Seaborn and Matplotlib.
- Applied chunking optimization, CF convention standardization, and multi-variable scaling techniques to convert datasets into Analysis Ready Cloud Optimized (ARCO) ZARR format, achieving optimal spatial-temporal chunking patterns for optimal data retrieval.

## PROJECT EXPERIENCE

### VaultAssist MCP Server

Aug 2025

- Built a secure, vault-grade MCP server in TypeScript that exposes 50+ Google Workspace tools (Gmail, Drive, Calendar, Docs, Sheets, Slides, Tasks) through OAuth 2.1, sequential thinking, and graph-database-backed memory, enabling natural-language automation and cross-service context management for personal AI assistants.

### Agent Memory System

Jul 2025

- Designed a hybrid memory framework inspired by mem0 & langgraph that combines vector search (ChromaDB) and graph relations (Neo4j) to store, retrieve, and manage semantic, episodic, and procedural memories for AI agents, enabling parallel queries and intelligent memory lifecycle management via LLM inference.

### ADK Agent Tutor

May 2025 – Jun 2025

- Developed an AI tutoring multi-agent system using Google's Agent Development Kit (ADK) that orchestrates subject-specific sub-agents (Math, Physics) driven by Gemini for interactive student engagement, resulting in improved learning outcomes through personalized AI-driven instruction. The sub-agents had access to their own specific set of tools and also had few-shot learning prompts for enhanced output generation.

### Fashion Tagging Engine

May 2025 – Jun 2025

- Engineered a computer vision-based fashion tagging engine that analyzes video and image content to identify fashion items and find similar products from catalogs, leveraging DINO (object-detection) and Fashion-CLIP (embedding generation) which resulted in accurate product recommendations.

## EDUCATION

### KIIT University

Bhubaneswar, India

B. Tech. in Computer Science and Engineering

Graduation Date: Jun 2026

## TECHNICAL SKILLS

**Languages:** Python, TypeScript, Go, SQL, C, Bash, Rust

**Libraries:** FastAPI, Flask, Streamlit, Pandas, Xarray, Dask, PyTorch, Transformers, LangChain, LlamaIndex, Next.js, Hono, React, TailwindCSS

**Cloud & DevOps:** AWS (EC2, S3, Lambda, RDS), Docker, DigitalOcean, Azure, Prometheus, Grafana, Git, GitHub Actions

**Data & ML:** PostgreSQL, MongoDB, Neo4j, ChromaDB, Qdrant, Weaviate, FAISS, OpenCV, Redis/Valkey, Scikit-learn, Seaborn, Matplotlib

## CERTIFICATES

Oracle Cloud Infrastructure 2024 Certified AI Foundations Associate