ARITTRA BAG

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PROFESSIONAL SUMMARY

Applied AI and Software Engineer building production-grade, full-stack AI applications, agentic workflows, and data-driven systems. Experienced in Python, LangGraph, RAG, prompt engineering, structured outputs, tool calling, and evaluation frameworks. Focused on grounded AI outputs, guardrails, HITL controls, observability, and optimizing model quality, latency, and cost.

EDUCATION

B.S. in Data Science and Applications, Indian Institute of Technology Madras — Jan 2023 – Aug 2026
B.Tech. in Computer Science and Engineering, Netaji Subhash Engineering College — Oct 2022 – Jun 2026
B.Tech. CGPA: 8.00/10

SKILLS

Languages:	Python (Async, Typing), C++, JavaScript, TypeScript, SQL
AI & Agents:	LLMs, LangGraph, LangChain, RAG, MCP, Tool Calling, Prompt Engineering
LLM Engineering:	Structured Outputs, Guardrails, HITL, Embeddings, Pinecone, ChromaDB, FAISS
Evaluation & ML:	LangSmith, Langfuse, DeepEval, RAGAS, PyTorch, TensorFlow, LLM-as-a-Judge
MLOps:	Kubeflow, MLflow, W&B, RLHF, PEFT, LoRA, QLoRA, Quantization
Backend & Data:	FastAPI, Flask, REST APIs, PostgreSQL, Redis, pandas, Snowflake, Databricks
Frontend:	React.js, Vite, Dash, Plotly, Streamlit
Cloud & DevOps:	Docker, Kubernetes, AWS, GCP, Linux, CI/CD, GitHub Actions, pytest
Reliability & Security:	New Relic, Grafana, k6, Observability, RBAC, API Security
Developer Tools:	Git, GitHub, Claude Code, Codex

EXPERIENCE

Software Engineer I (SDE-1, Previously Intern) | rtCamp (Remote) — *Jan 2026 – Present*
Building production SaaS features within the WordPress ecosystem using Python/Frappe and React. Architected and shipped the EasyEngine MCP server, supporting 80+ tools and 300+ operations with OAuth, tenant-scoped RBAC, and human approval safeguards. Owned architecture, integration testing, CI/CD, documentation, and production deployment, alongside enterprise troubleshooting and platform security.

Applied AI/ML Consultant | iion (Remote) — *Jul 2026 – Present*
Previously AI/ML Intern (Oct 2025 – Mar 2026)
Building production AI systems across iion's customer-facing Immersiion and internal Cognitiion adtech platforms. Developing multi-agent campaign intelligence, classification, anomaly detection, and optimization workflows using Python, LangGraph, and LangChain, with prompt engineering, structured output validation, data grounding, guardrails, and LangSmith-based tracing and evaluation.

AI/ML Project Lead (Part-time) | A1 Future Technologies Pvt. Ltd. — *Mar 2025 – Dec 2025*
Led a 7-member development team to deliver full-stack AI applications, RAG pipelines, vector retrieval using Voyage AI and Pinecone, and tool-calling agents for commercial clients. Owned architecture, code reviews, automated testing, and production deployments on AWS, reducing API latency by 40% and deployment time by 30%.

Research Intern | Indian Statistical Institute — *Jan 2025 – Apr 2025*
Processed 16M+ COVID records through ETL, PCA, and clustering; evaluated clustering quality using DBI, CHI, and Silhouette Score and delivered interactive analytical dashboards for stakeholders.

ML Developer Intern | ScaleNow Technosolutions — *Sep 2024 – Mar 2025*
Developed predictive ML pipelines, automated Snowflake ETL, deployed Flask inference APIs, and built RBAC-secured analytical dashboards for a Data-as-a-Service platform.

ACHIEVEMENTS

Best Paper Award, ICDMIS 2026 (Track 7) – Forensic DocStitch | **IEEE Publication, ICIPCN 2026** – WBCovidVizTool | **1st Runner-Up**, SIH Internal 2025 & Ignitathon 2025 | **Top 5 Finalist**, Hack4Bengal 4.0

PROJECTS

- **OpsGraph** | **Live** | **Code**: Built an open-source, self-hosted **FastAPI/LangGraph** workspace for AI-assisted PostgreSQL investigations, grounding agent outputs in verifiable database evidence. Enforced bounded read-only SQL, approved-table access, query limits, evidence capture, citations, audit trails, and failure recovery.
- **Quant Trade Simulator** | **Live** | **Code**: Built an AI-powered trading simulator with an interactive Python/Dash interface, real-time L2 orderbook analysis, slippage estimation, and sentiment analysis. Developed a **LangGraph** execution agent with tool calling, **HITL** approval, deterministic safety checks, and an **LLM evaluation harness** across 4 models; validated plans against **19K+ recorded trades** and shipped 6 read-only **MCP** tools.
- **RetailOps BI** | **Code**: Built an AI-powered business intelligence platform using **Spark, Snowflake, and PyTorch**, integrating automated ETL, forecasting, A/B testing, and interactive dashboards. Implemented **RAG** and **LangChain** for data-driven business insights and decision support.
- **Forensic DocStitch** | **Best Paper Award**: Developed a multimodal document reconstruction pipeline combining **DINOv2**, CNN-based edge features, contour geometry, OCR, and vision-language models. Achieved **0.768 macro AP** against a 0.481 baseline and **0.852 ROC-AUC**, demonstrating systematic model evaluation and evidence-driven experimentation.
- **Dataset-Maker & dm-bench** | **Live** | **Code** | **Dataset**: Independently developed an open-source, deterministic document fragmentation pipeline for Forensic DocStitch using domain-warped Voronoi tessellation, exact reconstruction ground truth, and automated validation. Published a reproducible evaluation benchmark with **5,884 samples**, held-out test splits, baseline solvers, and **1.6K+ downloads in 30 days** on Hugging Face.