

# Aritra Ghosh

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## Education

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**University of California, San Diego**

September 2022 - June 2025

*B.S. in Computer Science*

*San Diego, CA*

- **Relevant Coursework:** Statistical NLP, Recommender Systems, Web Mining, Software Construction

## Work Experience

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**Abu Dhabi National Oil Company**

Summer 2024

*Machine Learning Engineer Intern*

*Abu Dhabi, UAE*

- Developed robust machine learning pipeline for oil spill detection utilizing hyperspectral satellite imagery
- Diversified data via GAN-based augmentation & RGB-to-HSI conversion, boosting performance by 15%
- Automated oil spill mapping, reducing manual analysis time by 70% through visual segmentation models
- Engineered forecasting system using environmental data to forecast the movement & impact of oil spills
- Optimized model deployment via cloud-based processing, model quantization, and parallelized inference
- Prototyped live monitoring system with automated alerts, amortizing detection-to-response time by 50%

## Projects

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**Coding Agent** | [[Code](#)] [[Blog](#)]

- Developed agentic code review framework with augmented LLM calls & human-in-the-loop mechanisms
- Designed parallelized LLM calls for static code analysis & planner-executor workflow for code generation
- Integrated context-aware tool-selection & tool-calling with customized functions for static code analysis
- Implemented RAG pipeline via semantic search on vector database for contextual documentation retrieval

**Web Crawler** | [[Code](#)] [[Blog](#)]

- Devised differentially private web crawler to synthesize analytically valuable data from extracted content
- Engineered text transformation system utilizing semantic preservation algorithms & statistical resampling
- Added configurable privacy budget system allowing users to balance data utility vs. privacy guarantees
- Created parallel processing system to enable concurrent processing of multiple web sources transformation

**Model Probe** | [[Code](#)] [[Blog](#)]

- Engineered monitoring system that intercepts & analyzes intermediate CoT reasoning steps from LLMs
- Built sentiment analysis pipeline to detect value misalignments between AI systems & human stakeholders
- Incorporated rule-based checks for known policy violations & unsupervised learning for anomaly detection
- Designed real-time alerting system to notify stakeholders when model deviates from intended value system

**Prompt Silo** | [[Code](#)] [[Blog](#)]

- Built secure offline-first private prompt management system & deployed as Obsidian community plugin
- Implemented timestamp logging, PII redaction, & AES-256 encryption to store prompts with metadata
- Developed dual-key system with separate access tiers, enforcing fine-grained controls to facilitate visibility
- Integrated automated local backup & archival process, preventing data loss & enforcing data redundancy

## Technical Skills

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**Certifications**

AWS AI Practitioner, AWS Machine Learning Engineer, AWS Data Engineer

**Languages**

Python, Java, C++/C, Julia, Scala, Go, R, MATLAB, SQL, Perl, JavaScript

**Software**

PyTorch, TensorFlow, LangChain, LlamaIndex, Docker, Kubernetes, Jenkins