

PROJECTS

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- Interactive Data Catalog** | *Next.js, Apache Superset, Node.js* 2025
- Built an interactive data catalog web application using Next.js for UI and integrated Apache Superset via embedded dashboards for dataset exploration.
 - Developed Node.js microservices to retrieve metadata and execute SQL queries, enabling users to browse, filter, and preview datasets seamlessly.
 - Implemented access controls and audit logging with Keycloak and PostgreSQL for secure data governance.
- Swarm Simulation Visualization** | *SvelteKit, Three.js, Python FastAPI* 2025
- Designed a 3D WebGL-based UI with Three.js and SvelteKit to visualize real-time drone route optimizations from spatio-temporal datasets.
 - Created FastAPI endpoints to stream simulation data and control parameters, enabling users to manipulate swarm behavior on-the-fly.
 - Added performance metrics overlays and animation controls with integration to D3.js charts for detailed analysis.
- MLOps Dashboard** | *Next.js, MLflow, Docker, GitHub Actions* 2025
- Developed a full-stack MLOps dashboard using Next.js that interfaces with MLflow's REST API to display experiment runs, metrics, and model versions.
 - Containerized the dashboard with Docker and deployed via GitHub Actions on a Kubernetes cluster, enabling automated updates on new experiments.
 - Integrated Prometheus for resource monitoring and set up alerts via Slack webhook for experiment failures.
- End-to-End ML Pipeline with MLOps** | *Kubernetes, MLflow, Airflow, Docker, FastAPI, Next.js, Grafana* 2024
- Designed and deployed a scalable machine learning pipeline for tabular data, automating data ingestion, model training, and deployment using Airflow, MLflow, and Docker on a Kubernetes cluster.
 - Implemented CI/CD for model retraining and versioning with GitHub Actions, automated monitoring, drift detection, and rollback via MLflow and Grafana dashboards.
 - Built a Next.js frontend dashboard for real-time pipeline metrics and error tracking, integrating FastAPI endpoints for live inference.
- LLM Fine-Tuning and Deployment** | *Hugging Face Transformers, FastAPI, SvelteKit, Qdrant* 2024
- Fine-tuned open-source LLMs (e.g., Llama 2, Falcon) on domain-specific datasets using Hugging Face Transformers and managed experiments with MLflow.
 - Deployed inference microservices via FastAPI, orchestrated on Kubernetes, and served vector search through Qdrant for semantic retrieval.
 - Developed a SvelteKit web app with interactive chat interface and integrated streaming responses for real-time user interactions.
- Real-Time Data Analytics Platform** | *Kafka, Spark, Apache Druid, Apache Superset, Remix* 2023
- Engineered a real-time analytics platform for streaming financial data using Apache Kafka and Spark Structured Streaming.
 - Automated ETL pipelines into Apache Druid for low-latency OLAP queries and built interactive Remix dashboards embedded via Superset for business insights.
 - Set up alerting and performance monitoring using Grafana and Prometheus to ensure SLA compliance.
- Computer Vision for Defect Detection** | *PyTorch, OpenCV, TorchServe, Next.js* 2023
- Built and deployed deep learning models for automated defect detection in manufacturing images (95%+ accuracy) using PyTorch and OpenCV preprocessing.
 - Served models with TorchServe on Kubernetes, enabling scalable, low-latency inference.
 - Created a Next.js frontend for image uploads and real-time bounding-box overlay visualization, using WebSockets for live updates.
- Recommendation System at Scale** | *Presto, TensorFlow, Flask, Vite + Vue 3* 2022
- Designed a hybrid collaborative filtering and content-based recommendation engine on large-scale datasets using Presto and TensorFlow.
 - Exposed recommendations via a Flask API, deployed on Docker and Kubernetes with experiment tracking in MLflow.
 - Launched a Vite + Vue 3 web app showcasing dynamic product feeds and conducting A/B tests through feature flags.
- Time Series Forecasting for Business** | *Prophet, ARIMA, DVC, Grafana, Dot NET Core Web API* 2022
- Implemented time series forecasting models (Prophet, ARIMA) for sales and demand prediction with versioning and reproducibility via DVC.
 - Deployed forecasting services as a Dot NET Core Web API on Docker, enabling scheduled retraining.
 - Visualized forecast outputs and scenario analyses in Grafana dashboards with interactive time sliders.
- NLP Pipeline for Sentiment Analysis** | *spaCy, NLTK, BERT, Meilisearch, Remix* 2021
- Developed an end-to-end NLP pipeline leveraging spaCy, NLTK, and BERT embeddings for social media sentiment analysis.
 - Indexed processed texts in Meilisearch for full-text search and built REST endpoints with FastAPI.
 - Created a Remix-based frontend displaying sentiment trends and allowing custom query filters with real-time updates.