

# Konstantinos Kastritis

Data Scientist | AI Engineer

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## PROFILE

Data scientist and AI engineer building LLM-based applications, predictive models, and data-intensive simulations. Strong in Python, scientific computing, and machine learning with practical experience designing end-to-end data pipelines, model development, and deployment.

## SKILLS

Programming: Python, TypeScript, C, C++, CUDA

ML & Data: NumPy, Pandas, SciPy, SQL, scikit-learn, PyTorch, XGBoost, Model evaluation, Matplotlib, Plotly

LLM & GenAi: Context and prompt engineering (system instructions, JSON-structured outputs), multi-model orchestration, agentic workflows, OpenAI/Gemini/HuggingFace/Groq APIs

Data Engineering: FastAPI, ETL pipelines, Data visualization, APIs, Websockets

DevOps: Git, Linux, Docker, CI/CD

Frontend: React, Tailwind

## EXPERIENCE

### Architect & Lead Developer - Synecho

Jun 2025 – Present · Remote | <https://synecho.app>

- Launched a SaaS that analyzes variation in LLM outputs so users can track shifts in brand/topic perception across repeated prompts.
- Built a React/Tailwind UI with a prompt workflow and dashboard for statistics, judge summaries, and per-request prompt-response transcripts.
- Implemented a Python/FastAPI backend with SQLite persistence, coordinating async calls to Gemini, Groq, and OpenAI and aggregating outputs into quantitative metrics (similarity, sentiment, term/phrase statistics).
- Orchestrated a multi-step “LLM-as-judge” workflow (candidate models + judge) with JSON-structured outputs to score, summarize, and constrain hallucinations in responses.
- Reduced perceived latency with concurrent LLM calls and WebSocket streaming; containerized with Docker and deployed on a VPS behind a reverse proxy with CI/CD via GitHub Actions.

### Career Break

Dec 2024 – April 2025

- Personal leave; resumed full-time availability after successful treatment.

### Researcher – Ontario Tech University

Jun 2024 – Nov 2024

- Extended HOOMD-blue physics simulation software (Python/C++/CUDA) with custom particle interactions and tests to validate GPU-accelerated simulations.
- Analyzed simulation and experimental datasets with Python (NumPy/Pandas), generating plots and metrics for publication.
- Documented the HOOMD-blue modifications and build process so collaborators could reproduce changes.
- Contributed to research discussions, proposing data-driven approaches to modeling and analysis.

### Independent Data Scientist / Research Engineer

August 2022 – May 2024

- Shipped independent ML projects, including polymer conformation generation and Reddit sentiment analysis.
- Explored ML and data science techniques on real datasets beyond formal roles to deepen practical skills.

## **Researcher – Ontario Tech University**

Sep 2021 – Jun 2022

- Built data pipelines in Python to ingest, clean, and store simulation outputs, improving storage efficiency.
- Defined metrics to quantify experimental/simulation behavior, reducing data collection overhead.
- Enhanced simulation tooling to automate batch runs and post-processing, enabling more complex studies.
- Provided technical guidance to graduate students on data analysis and scripting.

## **Graduate Research & Teaching Assistant – Ontario Tech University**

Jan 2015 – Dec 2020

- Developed C++/CUDA APIs for GPU-capable simulation software, increasing performance by ~50% and enabling faster simulation studies.
- Provided data-driven and theoretical insights to experimental collaborators and co-authored two peer-reviewed publications based on combined simulation and experimental results.
- Supported group migration to GPU computing; wrote documentation and trained six students in custom simulation tools.
- Led labs and tutorials for physics and computer science courses teaching ~50 students per term core skills in Physics, Linux, Python, and data visualization.

## **SELECTED PROJECTS**

### **Polymer Conformation Generation (<https://alysides.kastritis.dev>) | PyTorch, Transformers, FastAPI, React**

- Trained a transformer model on MD simulation data of coarse-grained semiflexible polymers to learn the equilibrium distribution of bond vectors and chain conformations.
- Used the model to sample near-equilibrated chains as MD starting states, reducing the need for long thermalization runs whose relaxation time grows at least quadratically with chain length.
- Built an interactive FastAPI + React web app where users select chain length (within limits for performance), generate sample conformations on demand, and inspect basic configuration statistics.

### **Social Media Sentiment Analysis | Python, SQL, scikit-learn, PRAW, Plotly**

- Scrapped posts and comments from five subreddits with PRAW and stored 25,000+ comments in a SQL database via Pandas.
- Trained a scikit-learn classifier for sentiment analysis, achieving 86% accuracy on held-out data.
- Built a dashboard with six key metrics (sentiment by subreddit, comment volume over time, etc.) to explore Reddit user behavior.

## **EDUCATION**

### **Ontario Tech University – M.Sc., Materials Science | Aug 2019**

Thesis: Computational Studies of Semiflexible Polymer Dynamics Under Confinement

### **Ontario Tech University – B.Sc., Physics | Dec 2016**

Thesis: N-Body Simulations of Dark Matter Halos

## **AWARDS**

NSERC Undergraduate Research Award

## **LANGUAGES**

English (fluent), Greek (fluent)