

# Konstantinos Kastritis

Data Scientist | Software Developer (ML)

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## PROFILE

Data scientist and software developer building LLM-based applications, predictive models, and research-grade 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, C, C++, TypeScript, SQL, CUDA

ML / Data: NumPy, Pandas, SciPy, scikit-learn, PyTorch, Matplotlib, Plotly

LLM / Systems: Context and prompt engineering (system instructions, JSON-structured outputs), multi-model orchestration and agentic workflows

Backend: FastAPI, WebSockets

Frontend: React, Tailwind

DevOps: Git, Linux, Docker, GitHub Actions

## EXPERIENCE

### Synecho – Founder & Lead Developer

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 coordinating async, parallel calls to Gemini, Groq, and OpenAI, aggregating outputs into quantitative metrics (similarity, sentiment, term/phrase statistics).
- Designed an LLM-as-judge layer using system instructions and JSON-structured outputs to produce reliable summaries and constrain hallucinations.
- Orchestrated a multi-step, agentic LLM workflow (candidate models + judge model) to aggregate, score, and summarize responses into actionable insights.
- Improved perceived latency with concurrent API requests and WebSocket streaming for judge output; deployed on a VPS with SQLite and CI/CD via GitHub Actions.

### Researcher – Ontario Tech University

Jun 2024 – Nov 2024

- Extended physics simulation software (Python/C++), enabling new experiment types and parameter sweeps.
- Analyzed simulation and experimental datasets with Python (NumPy/Pandas), generating plots and metrics for publication.
- Drafted manuscript sections and figures for peer-reviewed journals, validating results with statistical methods.
- Contributed to research discussions, proposing data-driven approaches to modeling and analysis.

### 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 (quantum mechanics, Linux, Python programming).
- Taught ~50 students per term core skills in Linux, Python, file system management, 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**

- Scraped 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)