Xristopher Aliferis

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Education

University of Western Ontario — London, ON
Bachelor of Engineering Science in Software Engineering — *Sept. 2022 – Apr. 2026*

- **Cumulative Average:** 88.45/100
- **Honors:** Dean's List (2023–2025)
- **Relevant Coursework:** Introduction to A.I. (98), Theoretical Foundations of SE (96), Algorithms & Data Structures (92), Linear Algebra & Numerical Analysis (87), Applied Math for Engineers II (84), Microprocessors (100).
- Transferred from the University of Miami.

University of Miami — Miami, FL
Bachelor of Science in Computer Engineering — *Sept. 2021 – May 2022*

- **Cumulative Average:** 3.95/4.0
- **Honors:** Dean's (2021, 2022), Provost's (2021, 2022), and President's Honor Roll (2021)

Research

Data Processing and Model Benchmarking for Predictive Maintenance — Abstract Submitted, 2025
X. Aliferis; Y. Tang; F. Heidari; T. Wei — University of Western Ontario

- Built a unified preprocessing pipeline for heterogeneous railway detector data, including denoising, trend extraction, imputation, and multi-rate fusion.
- Applied multi-scale signal processing (FFT filtering, decay smoothing, adaptive trends) that improved detector SNR by up to +16.7 dB.
- Benchmarked linear models, tree ensembles, and deep sequence architectures using forward-in-time evaluation.
- **Presented at:** INFORMS Annual Meeting (Oct. 2025).

Awards & Scholarships

INFORMS RAS Problem Solving Competition — 1st Place — 2025
INFORMS Railway Applications Section

International competition; won 1st place for an ML-based predictive maintenance solution.

NSERC Undergraduate Student Research Award (USRA) — 2025
NSERC & University of Western Ontario

Competitive national research award supporting full-time undergraduate research under Dr. Yili Tang.

UWO In-Course Scholarship (Year IV) — 2025
University of Western Ontario

Awarded to the top 63 students university-wide based on third-year academic performance (top $\approx 0.8\%$).

Experience

NSERC Undergraduate Research Student — May 2025 – Present
University of Western Ontario — MoTech Group — *London, ON*

- First author on a study of machine learning methods for railway predictive maintenance, focusing on preprocessing and model evaluation.
- Developed a unified multi-source preprocessing pipeline and designed forward-in-time benchmarking experiments.
- Collaborated with Dr. Yili Tang and postdoctoral researchers on model interpretation and validation, contributing to the group's INFORMS RAS competition-winning submission.

Software Developer Intern — May 2024 – Aug 2024
1VALET — *Ottawa, ON*

- Developed a 1VALET Alexa Skill for two-way communication with 1VALET's API, enabling personalized information retrieval for users, leading to an increase in user engagement.
- Implemented real-time notification system using C#/.NET, improving user response time and enhancing user convenience significantly.

Software Engineering Intern May 2023 – Aug 2023
Med-Eng *Ottawa, ON*

- Built a C# Windows application with Scrcpy and ADB to streamline device setup, stabilize video connection, and minimize failures.
- Developed a companion Android app in Kotlin for live audio transfer, enabling reliable audio–video sync and improving usability for recording workflows.

Software Developer Intern June 2022 – Sept 2022
BDO Lixar *Ottawa, ON*

- Predicted values up to 98.3% using the iris dataset and machine learning.
- Used NLTK to tokenize, stem data, and implemented TF-IDF and Wordclouds for ML techniques.
- Parsed and manipulated large CSV and JSON datasets.

Technical Skills

Languages: Python, C++, Java, C#, JavaScript
Machine Learning: Supervised/unsupervised learning, model benchmarking, feature engineering
Frameworks & Libraries: PyTorch, TensorFlow, scikit-learn, XGBoost
Data & Signal Processing: NumPy, Pandas, SciPy, PyWavelets, Matplotlib
Tools: Git, LaTeX

Selected Projects

Small-Model Algorithmic Reasoning via Supervised Fine-Tuning | *Python, PyTorch, PEFT/LoRA* 2025

- First-authored a self-directed research-style manuscript studying whether supervised fine-tuning can push a 1.5B LLM toward a 72B reference model on multi-step algorithmic reasoning.
- Built a unified next-K-step benchmark across Fibonacci, Towers of Hanoi, 8-puzzle, and N-Queens using exact solvers, stratified splits, and strict output-format prompting.
- Implemented a LoRA fine-tuning and evaluation harness with task-specific structural metrics (recurrence checks, move legality/state divergence, board dynamics, queen-conflict rates) to measure rule-consistent reasoning beyond exact match.

LinkU | *React, Node.js, Supabase, Letta, VoyageAI* | UC Berkeley AI Hackathon June 2025

- Built a social networking platform where personalized AI agents act as digital twins, initiating conversations with compatible agents and surfacing promising connections for users.
- Developed a match pipeline using VoyageAI embeddings with cosine similarity to rank and connect top-5 most similar user profiles, enabling authentic and scalable social discovery.

WeVoteLive | *C++, ixWebSocket, SvelteKit, TypeScript* April 2025

- Engineered the C++ server atop ixWebSocket, building the multithreaded core (per-connection workers, priority dispatcher, mutex/condvar queues), JSON state, and automatic room expiry/cleanup for reliable real-time polls.
- Delivered a full-stack live polling app with room-code access, host-controlled polls, participant voting, and seamless client–server sync.