Ryan Li

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TECHNICAL SKILLS

Languages: Python, C++, C, R, SQL, JavaScript, Racket
Libraries/Frameworks: NumPy, pandas, matplotlib, Plotly, scikit-learn, PyTorch, FastAPI, FFmpeg, React
Tools: Git, Linux shell, VS Code, Jupyter Notebook, Excel

EXPERIENCE

WatStreet Design Team — Dec 2025 – Present
University of Waterloo

- Working on the 5-Minute Momentum Flag System as a core member of Waterloo's Quant Finance design team.
- Designing and backtesting an intraday momentum trading strategy in Python that identifies momentum continuation "flags" on **5-minute bars** using VWAP and EMA indicators.

UBC Timber Engineering Lab Assistant — Jun 2024 – Aug 2024
University of British Columbia

- Supported PhD and postdoctoral researchers in managing and organizing experimental data. Recorded earthquake test measurements in Excel and standardized data for cross-platform analysis.
- Developed Python scripts in pandas and matplotlib to create clear, reproducible graphics visualizing results.

PROJECTS

Weather-Conditioned Music Classification Engine — Nov 2025 - Jan 2026

- Co-developed a full-stack web application mapping user-inputted songs to weather categories. Integrated Spotify, ReccoBeats, and OpenWeatherMap APIs and designed pipelines to preprocess training/testing and user data.
- Trained and compared multiple models in scikit-learn (Naive Bayes and Logistic Regression baselines, Random Forest, Gradient Boosting), achieving **0.76 weighted F1** with 5-fold stratified cross-validation.
- Optimized using **permutation feature importance** and diagnosed misclassifications through confusion matrices visualized in matplotlib.

Semantic- and Signal-Aware Audio Ad Insertion Engine - UofTHacks Winner — Jan 2026

- Developed a full-stack B2B web application and API for natural insertion of human-like sponsor reads into podcasts and songs, integrating OpenAI API for contextual ad generation and ElevenLabs API for text-to-speech, voice cloning, and diarization across a Node.js + Python audio pipeline.
- **Reduced processing latency by 35%** by supplementing LLM-based loudness normalization, rhythm alignment, and audio stitching with FFmpeg/librosa/pydub pipelines. Designed and integrated a React/TypeScript frontend allowing for previewable and customizable ad placements. Won Best Use of ElevenLabs at UofTHacks 13.

Steel Supply Chain Optimization System — Nov 2025

- Built an interactive decision-support dashboard optimizing steel shipping routes from **50+ global manufacturers** to 26 major U.S. industrial hubs. Formulated CO_2 emissions/cost/time trade-offs as a multi-objective optimization problem and applied heuristic weighted sums to find most efficent routes.
- Implemented a FastAPI layer linking optimization engines to a React.js frontend. Used pandas to clean and aggregate both dynamic and static datasets and created Plotly visualizations showing emissions, costs, and route trade-offs. Submitted to the 11th **MIT Energy and Climate Hackathon**, placing in the semifinals.

AWARDS & SCHOLARSHIPS

- **Waterloo National Mathematics Scholarship** ($15,000), Waterloo President's Scholarship of Distinction ($2,000)
- **Governor General's Academic Medal**, Churchill Scholar's Award ($1,250), BC Achievement Scholarship ($1,250)
- International Baccalaureate Diploma 44/45 (**top ~0.5% worldwide**)
- Notable math contest awards: Canadian Mathematics Olympiad Qualifier, **Fermat Student Champion** (placed 1/19644), 3× American Invitational Mathematics Examination Qualifier

EDUCATION

University of Waterloo — Waterloo, ON
Candidate for Bachelor of Honours Mathematics — *Sep 2025 – Present*

- **95.2% CAV, 98.0% Faculty Average**
- All Advanced Coursework: MATH145, MATH147, CS145, MATH146, MATH148, CS146