Calvin Lee

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Education

University of Waterloo — Waterloo, ON, Canada
Bachelor of Computer Science
- University of Waterloo President's Scholarship of Distinction | belairdirect Insurance Scholarship
- University of Waterloo Alumni @ Microsoft Entrance Scholarship in Mathematics | TC Energy STEM Scholarship

Work Experience

Software Developer Internship — Toronto, ON, Canada
Thri5 — *Jul 2025 – Aug 2025*
- Developed SQL pipelines for an early-stage **AI-powered retail operating system**, converting SAP/JSON data into clean **Snowflake** tables for real-time insights.
- Built **SQL queries** across **50+ datasets (23M+ rows)**, handling joins, normalization, and schema drift.
- Designed time-series anomaly detection queries to flag duplicate scans, expiring items, and inventory shrink.
- Identified and resolved a data integrity issue caused by misaligned shipment and store tables.
- Rebuilt inconsistent SAP time-series pipelines to unify historical and live inventory using Snowflake views.

FIRST Robotics Team 1360 — Oakville, ON, Canada
Software Engineer — *Sep 2021 – Jun 2025*
- Programmed competition robots in **Java** for autonomous and tele-operated control.
- Principal Mechanical and CAD designer for 15 robotics subsystem assemblies.

Projects and Independent Learning

GooseGrade | **Full-Stack Web Application** | Next.js 16, React 19, TypeScript, PostgreSQL, OpenAI API
- Built a **viral** academic service serving **5,000+ unique users** and **12,000+ page views**. Built using **Next.js** and **React** to solve an unmet student need for real-time grade tracking.
- Built **TypeScript**-based **GPT-4 powered parser**, extracting course weightings from syllabi for 1600+ courses, storing data into a **Supabase database**.

AI/ML Football Analysis System | **Computer Vision Project** | Python, YOLO26, OpenCV, Scikit-learn
- Created **machine learning pipeline** using **YOLO26** and **ByteTrack** to detect and follow players across match footage, achieving high accuracy through **model fine-tuning**.
- Developed a spatial mapping engine using **Perspective Transformation** to convert 2D videos into 3D coordinates, enabling precise measurement of player speed and distance.
- Used **K-means clustering** to automate team classification, utilizing **Pandas** to track ball possessions.

Tandem | **Interactive AI Study Platform** | FastAPI, Next.js, Gemini 2.0, WebRTC, ElevenLabs
- Developed a **multi-model AI tutor** using **ElevenLabs** to enable real-time conversations with interruptions.
- Built a visual reasoning engine using **Gemini 1.5 Pro** to analyze handwritten math on a digital whiteboard, providing live feedback via text-to-speech.
- Implemented a **FastAPI** pipeline that uses **Gemini 2.0** to transform raw PDFs and transcriptions into structured, interactive React study modules on the fly.

Skills

Languages: Python, SQL, C++, Go, TypeScript, JavaScript, C, C++, Java, HTML, CSS, Object Oriented Design
Frameworks & Web: Next.js, React, Node.js, Express, FastAPI, Supabase, Vercel, Tailwind CSS, Vite
AI & Data: YOLO26, ByteTrack, OpenCV, Scikit-learn, OpenAI API, Snowflake, Pandas, Git, Roboflow

Awards and Achievements

- **National Violinist: Top 6** in Canada. **1st place** violin competition finishes (**10x**), including Hamilton 2024.
- **Top 5.0%** Fermat Math Contest (2023); **Top 5.3%** Cayley Math Contest (2022).