

Zewen Liu

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Education

University of Waterloo

Sep 2023 – Apr 2028 [Expected]

Bachelor of Mathematics, Applied Mathematics

Waterloo, ON, Canada

Specialization in Scientific Computing and Scientific Machine Learning

Experience

University of Waterloo

Jan 2026 – Aug 2026

Computer Science Instructional Support Assistant

Waterloo, ON, Canada

- Fixed bugs and completed missing functionality in a previously unused **Python** code-style checker using **Codex**, enabling automated grading of **Marmoset** submissions.
- Proposed and built a **Python/pandas** tool to identify students with **iClicker** responses but no matching attendance record, exporting discrepancies to CSV for review.
- Built a **Python/XlsxWriter** CLI to create Excel attendance sheets from LEARN lists by section and date.
- Supported **900+** students across two terms and worked with professors to improve course workflows.
- Provided **100+** hours of office-hour support, independently led exam reviews, and proctored exams.

MorningStone AI+

Sep 2024 – Dec 2024

Backend Software Engineer

Beijing, China

- Built **FastAPI** endpoints for Excel/ZIP uploads, **pandas** data consolidation, and **MySQL** imports.
- Built a **FastAPI** endpoint to retrieve reports from **MinIO** and return JSON using an existing PDF parser.
- Refined prompts in a **Kimi/Gradio** chat extraction tool; added Excel/JSON exports and **MySQL** storage.

Projects

Award Calculator

Dec 2025 – Present

- Built a **SwiftUI** app for iPhone (including iPhone Duo) and iPad with **MapKit** route maps and saved itineraries; released a **public TestFlight beta**, with invitations available on request.
- Implemented **dynamic programming** to partition multi-flight itineraries and estimate award points under distance, routing, and stopover rules; added regression tests for pricing, routing, and APIs.
- Integrated **FlightAware** and **seats.aero** APIs for flight schedules and cached award availability, with caching, request deduplication, and quota handling.
- Normalized **43,216** minimum-connection-time rules for **7,844 airports** using **Python**.
- Localized the app in **3 languages**: English, Canadian French, and Simplified Chinese.

Flight Award Availability Search Tool

Sep 2024 – Aug 2025

- Built a **Python** client for the **seats.aero** API to query Aeroplan award availability by configurable routes.
- Added date, cabin, points, and airline filters; exported results to JSON files grouped by route.

Chess Game

Jul 2024 – Aug 2024

- Built **C++** board and CLI logic in a **team of three**, using polymorphic piece interfaces and **smart pointers**.
- Implemented the **Observer pattern** to synchronize console and X11 graphical displays with board updates.
- Implemented custom board setup and pawn promotion, and fixed en passant move classification.

AnonyLetter

Feb 2020 – Jun 2021

- Built and maintained anonyletter.com, an online service for sending personal letters by mail.
- Managed the service from website orders through letter printing and mailing.

Technical Skills

Languages: Python, Swift, SQL, C++, C, JavaScript, Java, Bash

Frameworks & Libraries: SwiftUI, MapKit, FastAPI, pandas, NumPy, Pydantic, Gradio, OpenAI SDK

Tools & Platforms: Git, Codex, Xcode, TestFlight, Linux, MySQL, MinIO, GitHub, GNU Make