

Eric Zhou

Software Engineer | AI Systems & Infrastructure

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EDUCATION

Queen's University

Bachelor of Computing (Honours)

– **GPA: 4.1/4.3** (Dean's List)

Kingston, ON

Expected 2026

TECHNICAL SKILLS

Languages: TypeScript, JavaScript, Python, Java, SQL, Bash

Frameworks: Next.js 15, React, Node.js, Express, FastAPI, Socket.io, Tailwind CSS

Databases & Tools: PostgreSQL, MongoDB, Qdrant, Redis, Docker, RabbitMQ, Git

AI & ML: Sentence Transformers, Vector Embeddings, RAG Pipelines, LLM Integration (OpenAI), Prompt Engineering

PROJECT EXPERIENCE

Semantic Code Search Engine | [GitHub](#) | *Python, FastAPI, Qdrant, Sentence Transformers*

Dec 2025

- Built an AI-powered code search engine using **Sentence Transformers** to generate 384-dim embeddings, enabling natural language queries like “async HTTP client” to find semantically relevant functions across **5 programming languages**.
- Implemented **hybrid search** combining vector similarity (Qdrant) with BM25 keyword matching using Reciprocal Rank Fusion, achieving superior relevance over keyword-only search.
- Developed AST-based code parsing with **Tree-sitter** to extract functions, classes, and methods with full signatures and docstrings from Python, JavaScript, TypeScript, Go, and Rust codebases.

Travel Debate AI | [Live Demo](#) | *Next.js 15, OpenAI, Redis*

Nov 2025

- Orchestrated **3 concurrent AI agents** to autonomously negotiate and generate balanced travel itineraries with real-time visualization of agent reasoning.
- Achieved **sub-50ms retrieval** using Redis to persist trips with UUID-based sharing; optimized streaming to reduce TTFB to **under 400ms**.

Repo Interview Prepper | [Live Demo](#) | *React, Vercel, OpenAI API*

Nov 2025

- Engineered recursive GitHub file parsing via **Octokit SDK**, injecting code context into LLM prompts; reduced costs **40%** with cascaded model routing.
- Architected serverless BFF layer with Vercel Edge Functions to secure API keys; achieved **95+** Lighthouse performance with optimized rendering.

Real-Time Chat Application | [Live Demo](#) | *React, Node.js, Socket.io*

Oct 2025

- Built WebSocket architecture with **Optimistic UI pattern**, ensuring **100ms message delivery** and **100% data consistency** with MongoDB.

WORK EXPERIENCE

Teaching Assistant - CISC 203 (Discrete Mathematics)

Sep 2025 – Present

Queen's University

Kingston, ON

- Mentored 200+ students in Graph Theory and Combinatorics, translating abstract proofs into digestible logical steps to improve technical communication skills.
- Analyzed recurring failure patterns in submissions to create a “Common Errors” guide, successfully reducing repetitive clarification inquiries by **15%**.
- Conducted root-cause analysis on student logic to identify edge cases in mathematical proofs, ensuring algorithmic correctness across **50+ weekly assessments**.