

# Kai Zhang

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## EDUCATION

### University of Waterloo

Bachelor of Software Engineering (BSE) — Cumulative Average: 96%

Waterloo, Ontario

Sept. 2025 – May 2030

## PROJECTS

[Wisp](#) | *React Native · FastAPI · OpenAI API · CI/CD · NLP · Supabase · Docker*

Nov 2025 – Present

- Built a **voice-first** mobile productivity app using **React Native (Expo)** and **FastAPI**, enabling real-time idea capture and **structured JSON output** with schema validation via **WebSocket streaming**
- Designed and deployed a **GitLab CI/CD pipeline** automating **pytest**, **Docker builds**, and **EC2 deployment** via **SSH** for a containerized backend and **Supabase** data layer
- Implemented a **low-latency real-time voice pipeline** integrating **OpenAI's Realtime API**, with custom **React Native audio streaming** and async backend handling for live voice interactions (<500 ms).
- Integrated a local **tool-calling server** with the OpenAI realtime agent, enabling asynchronous external actions such as database writes during live voice interactions.

[Rootify](#) | *Python · spaCy · FastAPI · SQLAlchemy · PostgreSQL · Docker*

July 2025 – Present

- Designed an **NLP ingestion pipeline** that dynamically fetches **Wikipedia** artist pages, extracts semantically relevant sections via **keyword-based selection**, and normalizes text into structured evidence.
- Built a **claims-first relational data model** separating source evidence from derived influence claims, preserving section hierarchy, provenance, and auditability.
- Implemented an **async, idempotent backend pipeline** using **FastAPI**, **SQLAlchemy**, and **PostgreSQL**, with **cache invalidation (TTL + versioning)** to safely re-ingest, re-extract, and serve cached results at scale.
- Engineered a **service-layer orchestration pattern** separating HTTP endpoints, cache policy, and data pipelines, enabling deterministic refresh behavior and clean extensibility to new data sources.

[Waypost](#) | *Python · FastAPI · React · Tailwind CSS · Firebase · Cloudinary*

October 2025

- Won **2nd place overall** at **NewHacks 2025** with a tourism-centered web app promoting circular economy
- Built a role-based authentication system using **Firebase Auth** to manage three distinct user types (tourist, business, retailer) with token-based permission logic for differentiated feature access
- Architected a type-safe **REST API** using **FastAPI** and **Pydantic v2**, integrating **Cloudinary** and **Firestore** for async frontend communication.

## TECHNICAL SKILLS

**Languages:** Python, SQL, C, C++, JavaScript, TypeScript, HTML/CSS

**Frameworks:** FastAPI, React, React Native, Node.js, spaCy, pandas, SQLAlchemy, Tailwind CSS, OpenAI API

**Databases & Cloud:** PostgreSQL, Supabase, Firebase Auth, Firestore, Cloudinary

**Developer Tools:** pytest, Docker, Docker Compose, Alembic, CI/CD, Git, GitLab, GitHub, Markdown

## EXPERIENCE & LEADERSHIP

### Full Stack Developer

Sept. 2025 – Present

*UW Orbital — University of Waterloo Satellite Design Team*

[Github Link](#)

- Designed and implemented an interactive **photo gallery interface** with grouped rendering (year/month), dynamic sorting, and a keyboard-accessible **lightbox viewer** supporting zoom, navigation, and metadata display.
- Refactored client-side state management with **React Query**, reducing complexity and redundant API calls.

### Co-President

Oct. 2023 – May 2025

*Teens Teach Tech*

*Surrey, British Columbia*

- Initiated partnerships with local retirement homes to coordinate **140 hours of tech support workshops** between high school students and seniors in need, resolving issues such as online payments and family communication
- Mentored team members in effective communication with seniors, bridging community generational divides

### Personal Blogger

Aug. 2023 – Present

*Kai's Music Blog*

[kaizhang.substack.com](https://kaizhang.substack.com)

- Personal music review blog on **Substack** with over **45 dedicated subscribers** and **2000 total views**
- Expressed creativity by drafting **analytical critiques** of music works on a foundation of 700 listened-to albums