Kai Zhang

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Education

University of Waterloo — Waterloo, Ontario
Bachelor of Software Engineering (BSE) — Cumulative Average: 95% — *Sept. 2025 – Present*

Technical Skills

Languages: Python, SQL, C, C++, JavaScript, TypeScript, HTML/CSS, Bash
Backend: FastAPI, REST APIs, Asyncio, Redis, Pydantic
Data: PostgreSQL, Supabase, MongoDB Atlas, Firestore, SQLAlchemy, pandas, spaCy, scikit-learn
Frontend: React, React Native (Expo), Next.js, Tailwind CSS
Cloud & DevOps: AWS (Lambda, S3, EC2), Azure, Docker, GitHub Actions, Alembic, CI/CD, Git, Gitlab

Projects

Wisp | *React Native (Expo) · Real-Time Systems · WebSockets · Supabase* — GitHub
- Built a **voice-first** mobile productivity app using **React Native (Expo)** and **FastAPI**, enabling real-time idea capture via **WebSocket streaming** and schema-validated JSON output.
- Automated **pytest**, Docker builds, and **EC2** deployment via **GitLab CI/CD** with a **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 · SQLAlchemy · PostgreSQL · scikit-learn · AWS · GitHub Actions* — GitHub
- Designed an end-to-end data ingestion pipeline for processing unstructured Wikipedia, Wikidata, and YouTube data using **AWS Lambda** and **S3** to populate a normalized **PostgreSQL** schema.
- Developed a claims-first relational data model using **SQLAlchemy** and **Pydantic**, separating and standardizing raw evidence from derived analytics outputs to enable provenance tracking.
- Built an **async FastAPI** backend with idempotent ETL jobs and a **Next.js** API microservice providing **Redis**-backed TTL caching to reduce repeated computation.
- Integrated **binary classification models** using sentence embeddings and logistic regression, achieving **ROC-AUC ∼0.96** and **PR-AUC ∼0.94** on held-out data for influence claim validation.
- Deployed via **GitHub Actions CI/CD** to an **Azure** VM with automated Alembic migrations.

ReelJobs | *MongoDB Atlas · React Native (Expo) · Gemini · Docker · CI/CD* — GitHub
- Won **3rd place** at **DeltaHacks 12** with a reels-style job platform deployed via **GitHub Actions CI/CD**.
- Implemented **semantic job search** with 768 layer Gemini embeddings + **MongoDB Atlas vector query**, including per-user deduplication, "seen" tracking, and on-demand video generation on job descriptions.
- Shipped in **React Native** with **HLS streaming**, CDN-backed playback URLs, secure token storage, and a **Gemini-driven** Greenhouse application bot using **Playwright** for form analysis and auto-fill at **95% accuracy**.

Experience & Leadership

Full Stack Developer — Jan. 2026 - Present
WAT.ai — University of Waterloo AI Design Team — Website
- Selected for a six member ML team building a social media trend analysis platform supporting healthcare research

Full Stack Developer — Sept. 2025 – Present
UW Orbital — University of Waterloo Satellite Design Team — GitHub
- 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.
- Implemented database bootstrapping for satellite command and telemetry schemas, auto-loading validated definitions on API startup using **FastAPI** lifespans, **PostgreSQL**, and migrations.

Co-President — Oct. 2023 – May 2025
Teens Teach Tech — *Surrey, British Columbia*
- Coordinated **140+ hours** of tech support workshops for seniors by initiating partnerships with local retirement homes, mentoring student volunteers in effective cross-generational communication.