

Kai Zhang

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EDUCATION

University of Waterloo

Bachelor of Software Engineering (BSE) — Cumulative Average: 95%

Waterloo, Ontario

Sept. 2025 – Present

PROJECTS

Wisp | React Native (Expo) · Real-Time Systems · WebSockets · CI/CD

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 · scikit-learn

July 2025 – Present

- Designed and implemented an **end-to-end data ingestion pipeline** processing **unstructured text** from Wikipedia, Wikidata, and YouTube into a normalized, queryable relational schema.
- Developed a **claims-first PostgreSQL data model** (relational data modeling) separating raw evidence from derived analytics outputs, enabling provenance tracking and reproducible ETL pipelines.
- Built an **async FastAPI backend** with **idempotent ETL jobs**, **TTL-based caching**, and **versioned derived data** to ensure correctness under reprocessing and schema evolution.
- Integrated **binary classification models** (sentence embeddings + logistic regression), achieving **ROC-AUC ~0.96** and **PR-AUC ~0.94** on held-out data for influence claim validation.

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

Data Science & ML: Data Pipelines (ETL), pandas, spaCy, scikit-learn, Data Validation, Feature Engineering

Backend & APIs: FastAPI, Node.js, REST APIs, Async Python, Real-Time Systems, SQLAlchemy

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

Frontend: React, React Native, Tailwind CSS

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

Undergraduate Unofficial Transcript

Name: Zhang, Kai
Student ID: 21179659
Ontario Education Nbr: 921210324

Beginning of Undergraduate Record

Fall 2025

Program: Software Engineering, Honours, Co-operative Program
Level: 1A **Form Of Study:** Enrolment

<u>Course</u>		<u>Description</u>	<u>Attempted</u>	<u>Earned</u>	<u>Grade</u>
CHE	102	Chemistry for Engineers	0.50	0.50	97
CS	137	Programming Principles	0.50	0.50	92
MATH	115	Linear Algebra for Engineering	0.50	0.50	97
MATH	117	Calculus 1 for Engineering	0.50	0.50	94
MATH	135	Algebra for Honours Mathematics	0.50	0.50	100
MTHEL	99	First-Year Mathematics Readiness	0.00	0.00	CR
Course Topic:		First year readiness			
SE	101	Introduction to Methods of Software Engineering	0.25	0.25	85
			<u>In GPA</u>	<u>Earned</u>	
Term GPA		95.00 Term Totals	2.75	2.75	
Cumulative GPA		95.00 Cumulative Totals	2.75	2.75	

Winter 2026

Program: Software Engineering, Honours, Co-operative Program
Level: 1B **Form Of Study:** Enrolment

<u>Course</u>		<u>Description</u>	<u>Attempted</u>	<u>Earned</u>	<u>Grade</u>
CS	138	Introduction to Data Abstraction and Implementation			
ECE	124	Digital Circuits and Systems			
ECE	140	Linear Circuits			
ECE	192	Engineering Economics and Impact on Society			
ENGL	119	Communications in Mathematics and Computer Science			
MATH	119	Calculus 2 for Engineering			

Milestones

<u>Date Completed</u>	<u>Description</u>	<u>Status</u>
10/08/2025	Workplace Hazardous Materials Information System	Completed

Scholarships and Awards

2026 University of Waterloo President's Scholarship of Distinction

End of Undergraduate Unofficial Transcript