



Ruizhe Zhang

University of Alberta – BSc Computing Science

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Profile

Computing Science undergraduate at the University of Alberta with a strong interest in **application-level software development, full-stack systems**, and **applied AI**. Experienced in building practical backend services and data-driven applications using Python, FastAPI, and React. Strong programming foundation with consistent performance in core computing science courses.

Education

Bachelor of Science (BSc), Computing Science

University of Alberta

Expected Graduation: 2027

Relevant Coursework:

- Software Engineering
- Machine Learning
- Artificial Intelligence
- Databases and File Management
- Image Processing & Computer Vision
- Algorithms
- Practical Programming Methodology

Skills

Programming Languages

- Python
- Java
- JavaScript
- HTML, CSS
- C/C++

Development

- SQL, MongoDB
- REST APIs
- Git, Linux (user-level)

Software & Data

- Backend Development
- Full-Stack Web Development
- Data Processing
- Data Analysis
- Applied Machine Learning

Tools

- GitHub, VS Code
- NumPy, Pandas
- React / FastAPI

Projects

Mini Inventory Manager

Full-Stack Web Application | Python, FastAPI, React, SQLite

- Designed and implemented a full-stack inventory management system with a **FastAPI backend** and **React frontend**
- Built RESTful APIs for item CRUD operations, category filtering, search, and quantity updates
- Implemented data validation using **Pydantic models** and enforced constraints on inputs
- Developed a responsive UI featuring item grids, filters, search bar, and detailed item views

- Managed local persistence using **SQLite**, focusing on clean schema design and API integration

Database-Driven Sales & Order Management System

CMPUT 291 (Solo work) – File and Database Management | Python, SQLite

- Designed and implemented a **role-based application** supporting both **customers and sales users**
- Built **user registration and authentication** workflows with secure session handling
- Implemented customer features including **product browsing, shopping cart management, order placement, and order history**
- Developed sales-side functionalities to **manage inventory, review sales reports, and analyze popular products and search trends**
- Designed a normalized **relational database schema** and wrote parameterized SQL queries

Selected Machine Learning & Computer Vision Projects

- Implemented and trained **CNNs** for image classification (CIFAR-10)
- Built and experimented with **Vision Transformers** for visual recognition tasks
- Implemented **GANs, WGANs, Autoencoders, and VAEs** for representation learning
- Explored **semantic segmentation** and **object detection** pipelines
- Experimented with **diffusion models and flow matching** for generative modeling
- *Technologies: Python, PyTorch, NumPy*

3D Renderer with Ray Tracing

CMPUT 201 – Practical Programming Methodology | Python

- Implemented a **3D renderer from scratch**, generating images of spheres in 3D space
- Developed a **ray tracing pipeline** including ray–sphere intersection, surface normals, and lighting calculations
- Applied vector mathematics and geometric transformations to simulate semi-realistic lighting effects
- Structured the program to support incremental feature development and extensibility
- Strengthened problem-solving skills through translating mathematical models into working code

Languages	
English IELTS 7.0	Chinese Native
Japanese 2 years of University-level study	