James Liu

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Education

B.S. in Computer Science, Oregon State University Expected Dec 2025

• *GPA: 4.0*

Projects

S&P 500 Cross-Sectional Dispersion Algorithm | *C++, Python, JSON, Hetzner Cloud* Jupyter Notebook

- Designed a data processing pipeline on Hetzner Cloud to collect and analyze minute-by-minute data for all 2800 stocks on the NYSE & 3700 stocks on the Nasdaq exchange
- Implemented a RESTful API to communicate between analysis on Python and trade execution in C++
- Deployed the algorithm with a Chicago-based proprietary trading firm on Q3 2024

Processing Visual Art RAG App | *Python, OpenAI API, MongoDB* Ongoing

- Developed web scraping pipeline to collect and clean 1000+ documents from Processing documentation, forums, and community resources
- Engineered document preprocessing system with text splitting and embedding generation for vector storage
- Implemented MongoDB Atlas vector database for semantic search capabilities, laying groundwork for RAG architecture

AQI Display | *Python, PyObjC, SQLite, AppKit Framework* GitHub

- Developed native macOS menu bar application that provides up to 10+ air quality & pollutant metrics
- Implemented SQLite-based data management system for 24-hour historical tracking for user's environmental exposure

Food Good | *React Native, TypeScript* GitHub

- Built a React Native mobile app that recommends cooking recipes by tracking user ingredients with real-time filtering and sorting algorithms
- Implemented offline-first design with event-driven recommendation system using AsyncStorage for local data persistence

Technical Skills

Programming Languages: Python, C++, Java, Processing, JavaScript, TypeScript, SQL

Web Technologies: React, React Native, Node.js, Django, Flask, FastAPI, REST APIs, WordPress

Databases & Storage: PostgreSQL, SQLite, MongoDB, AsyncStorage

Cloud & DevOps: Hetzner Cloud

Data Science & Analytics: pandas, NumPy, Matplotlib, Polars, Seaborn

Relevant Coursework

Core: Data Structures & Algorithms, Discrete Structures, Computer Architecture & Assembly

Software Engineering: Web Development, Database Systems, Agile Software Engineering