HAO LOU

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Education

University of Southern California Agu 2024 – May 2027
Major: Applied and Computational Mathematics(BS) **Minor:**Computer Science(BS) **GPA**: 3.7/4.0

- **Coursework:** Data structure, Discrete Methods, Numerical Methods, Probability Theory, web development
- **Technical Stack:** Java, Python, C++, R, MATLAB, JavaScript, HTML/CSS, Pandas, PyTorch, Forecasting, AIGC
- React.js, Next.js, Ant Design, Mapbox, Spring Boot, Flask, REST APIs, MySQL, Git/GitHub, Cloudflare...

Honors

- Platinum Division Qualifier (highest level) in USA Computing Olympic(**USACO**) 2-3% qualification rate
- TOP 30% out of 1805 in **Kaggle research competition**: AMP®-Parkinson's Disease Progression Prediction
- States finalist (top 6 out of 56 teams) in First Technology (**Robotics**) Competition Florida Championship

Research and Work Experience

Large-Scale Occupational Coding & Fuzzy Matching with Prof. Zhuo Chen Sep 2025 – Present
Research Assistant Tsinghua University, China

- Built a scalable occupational coding pipeline in **Python** using **pandas**, jieba, **rapidfuzz** and **sentence embeddings** to map 15 million Chinese job titles to the national classification system, which increased coding accuracy by 18 percent and now provides labeled data for downstream clustering and modeling.

Huntsman Corporation May 2025 – Aug 2025
product development intern Shanghai, China

- The methanol synthesis process required maintaining an unknown ideal hydrogen-to-carbon monoxide ratio to suppress side reactions. Adapted a self-built **intelligent BI platform** and build Ratio Optimization and feature importance visualization module with **Spring Boot, MySQL, and React** for process monitoring and analysis.
- reduced analysis and prediction time by **60%**, and identified the optimal gas ratio (**2.12:1**) also extended catalyst lifetime—a breakthrough point.

Hundsun Technologies Inc. June 2023 – Aug 2023
Java software engineer intern China

- Migrated core financial product UI features using **React.js** and **Spring Boot** while standardizing **REST API contracts** for requests, responses and error handling, then engineered Java services to parse transaction streams, reconcile mismatches and trigger real time alerts, which cut reconciliation time from 45 minutes to under 5 minutes per batch and improved accuracy by roughly 90 percent.

IN THE PINES INC. June 2022 - Present
Co-Founder & Educational Lead, STEM Outreach Initiative (Grades 7–12) Delray Beach, FL

- Volunteered a nonprofit teaching many had **limited access** to technology and were in a **rebellious stage**.
- Exercised patience and adaptability, mediated conflicts, tailored communication to one's needs, coordinated with fellow volunteers, and designed lessons to make coding accessible and engaging and collaborative, promote club

Projects and Activities

VIOLA – Startup CRM SaaS Sep 2025 - Present

- Delivered a low-latency production-grade text-to-music search service for music supervisors by building Viola's stateless RESTful API layer with TypeScript, async job queues, input validation, logging and monitoring, which enabled rapid front-end iteration, reduced integration bugs by 40 percent and scaled reliably with a growing catalog.

Intelligent Data Analysis Platform Sep, 2024 – July, 2025

- Built a **full-stack** intelligent BI platform using **React, Spring Boot, Ant Design, OpenAPI...**, enabling users to upload raw datasets and automatically generate visualizations and insights.
- Implemented **asynchronous processing, message queues..** to improve scalability and system performance.
- Integrated **AI-generated content (AIGC)** for automated chart generation and narrative analysis, reducing repetitive manual work for data scientists and accelerating insight generation.

Automated Chemistry Lab Workflows

- Built a **web interface** for lab staff to upload experiment request PDFs and view monthly report summaries, integrating **JavaScript, HTML/CSS, and Flask (Python)** for front-end and back-end communication.
- Implemented **backend workflows** in **Python (pandas, PyPDF2)** and **VBA macros** to extract and process PDF content, track MSDS expiration dates with automated alerts (**Task Scheduler**), and forecast procurement needs based on historical consumables data. Reduced manual effort by ~40%, enabling lab staff to focus on the core.