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**: 3.85/4.0

- **Coursework:** Numerical Methods, Probability Theory, Discrete Methods, Calculus III, Data structure, Design theory, math for Machine Learning, **Computer programming:** C++, C, Java, Xcode, R, HTML, matlab, pytorch

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
- **iGEM** Bronze qualifier (57 out of 400+ teams) & **First prize** in the Global Future Space Scholars Meet (GFSSM)

Research and Work Experience

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

- The methanol synthesis process required maintaining an optimal hydrogen-to-carbon monoxide ratio, responsible for **Ratio Optimization**, Applied multi-objective optimization and **feature importance** analysis to built **Regression** and **Neural Network** models. Find ratio, slightly above the theoretical 2:1, to suppress side reactions and extend catalyst lifetime.
- Inert gases reduce effective partial pressures, and CO2 enhance catalyst activity, Designed **classification models** to predict process. **Found: gas:15%-25% CO2:2%-8%**
- The trade-off between low, and high, temp, to balance applied **Bayesian** and **genetic** algorithms to simulate different temp–pressure. could use **Reinforcement learning** for adaptive process(on going..)

Kaggle AMP®-Parkinson's Disease Progression Prediction competition Feb 16, 2023 – May 18, 2023
Individual Researcher Online Research competition

- Modeled **longitudinal protein&peptide abundance** to forecast Parkinson's progression via **MDS-UPDRS scores**
- Applied **time-series, feature engineering**(10000+samples) **normalization, dimensionality reduction**
- Leveraged Kaggle **streaming API** for unbiased evaluation; tuned ensembles & neural networks with **cross-validation & hyperparameter search** **RANKED**: **Top 30% of 1,805 teams**

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

- Migrated financial product UI features by collaborating with **React,JS** and **Spring Boot, REST APIs** ; aligned API contracts (request/response formats, error handling), resolved integration issues, and coordinated testing to ensure smooth rollout.
- Developed Java components to parse transaction data, reconcile mismatches, and trigger real-time alerts, automating manual trading&settlement workflows; reduced reconciliation time from 45 minutes to <5 minutes per batch (85% faster) and improved accuracy by 90%.

Volunteer and Activities

IN THE PINES INC. June 2022 - May 2024
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

USC Code The Change Nov 2024 - Present

- Teamed Voices Beyond Assault project, implementing a **secure, anonymous** online forum used by **100+** survivors to share experiences and seek support
- After the major fire in LA, Build **an interactive platform** to make Blue Sky LA's climate projects visible, searchable, and engaging for the public. Built with **NextJS, CloudFlare, and Mapbox**

Other Projects – Automated Chemistry Lab Workflows

- Automated PDF content extraction and upload, monthly report summarization, MSDS expiration tracking with alerts, and procurement forecasting by developing workflows with Python (pandas, PyPDF2), VBA macros, and scheduling tools.
- Improved reporting accuracy and reduced manual effort by 40%, enabling staff to focus on core lab operations.