Tianzuo Hu

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EDUCATION

University of California, Davis (US News 2025: Top 33) 2022.08 - 2026.06
Major: Applied Statistics, Minor Computer Science in Bachelor , College of Letters & Science Davis, CA

- **UC GPA:** 3.72/4.0, Statistics GPA: (3.9+/4.0)
- **Core Courses:** Multi-Calculus, Linear Algebra, Intermediate Micro and Macro Economics, Game Theory, Nonparametric Statistics, Regression Analysis, Mathematical Statistics, Analysis of Variance, Economic and Financial Forecasting, Applied Time Series Analysis
- **Computer Sci:** Discrete Math, Python Data Structures and Algorithms, C Data Structures, Software Development in UNIX and C++, Computational linguistics.

Honor/Competition:

- 2024-2025 International Quantitative Championship, highest ranking 134 on stage 1, top 10 place in the USA, gold medal in the Worldquant regular season;
- 2022-2023 FBLA Business Management Program ranked 7th in the China National final round; Business Decision Economics ranked 8th in the China National final round.

PROFESSIONAL EXPERIENCE

Haitong Securities Co.,Ltd 2024.06 - 2024.08
Derivative Pricing Intern, Derivatives and Trading Department Shanghai, CN

- **Analyzed OTC options derivatives.** study pricing strategies of various domestic structured products, used bullish shark-fin products and binary trees for pricing, and researched the characteristics of exotic options such as airbags, straddling options and snowball.
- **Assisted in calculating the average basis rate** in 20 days and 120 days, main contracts, etc., verifying historical volatility and implied volatility, etc.; **Assist in completing the equity market, bond market, and gold ETF overview sections for the first half and second quarter of 2024**. And, I mainly studied the implied volatility surface and **reproduced the prediction of implied volatility of ETF options by machine learning algorithm.**
- **Independently reproduced the financial technology article** "Machine Learning in CSI 300ETF Options", called and cleaned up the Huatai CSI 300ETF financial data web crawler and 50,000 datasets of Tushare website, built decision tree, random forest, BP neural network and XGBoost algorithm simulation and regression analysis. The trend of implied volatility in regression problem is studied. The overall index feedback is more than 70% accurate.

Guotai Junan Securities Co.,Ltd 2024.04 - 2024.06
Equity Research intern, Industry research institute Shanghai / Remote, CN

- **Independent PCB in-depth report writing:** Responsible for the preparation of a detailed 30-page industry analysis report on a well-known PCB company, as well as a comprehensive research report on the IGBT technology of a semiconductor. The report covers the business model, industrial chain structure, market positioning, competitive advantage and development strategy for the year 2023.
- **Comprehensive industry analysis:** In-depth study of PCB and semiconductor industry, including industry chain integration and IPO process, focusing on the role of sponsor companies and their impact on the market. Detailed data integration and analysis of annual revenue, net profit and market capitalization.
- **Data collation and analysis support:** Using Choice financial terminal, Snowball and major annual report platforms, collected and analyzed the prospectus, research reports and equity incentive announcements of Wang Electronics and Core Micro companies in the C39 industry. The companies in different circuits in the industry are systematically compared and sorted out.

RESEARCH EXPERIENCE

Kaggle Competition: Home Credit – Credit Risk Model Stability (Silver Medalist) 2024.04 - 2024.06

- **Developed a long-term stable credit default risk prediction model**, ranking 20th out of 3,856 teams (Top 0.5%) and earning a silver medal. This project handled millions of time-series data points, focusing on enhancing feature robustness and model generalization to improve the stability of credit risk assessment.
- **The model was built using LightGBM with time-series cross-validation (TimeSeriesSplit and GroupKFold).** To address class imbalance, SMOTE was applied, while KNN Imputer was used for missing value imputation. Additionally, feature selection and dimensionality reduction were incorporated to improve Gini stability and reduce prediction volatility (std residuals). The final model successfully optimized the Gini score degradation rate, enhancing its long-term credit risk prediction capabilities.
- This project involved large-scale time-series data processing, credit risk modeling, and stability optimization. It achieved significant improvements in Gini stability, reduced memory consumption by **70%**, and provided a more reliable loan approval solution for financial institutions.

Kaggle Competition UM-MCTS Variant Game Intensity Prediction Modeling (Bronze medal) 2024.11 - 2025.01

- Developed a machine learning model to predict MCTS variant win rates in 400+ games, processing 233,000 data points and extracting 443 features from game rules, complexity, and efficiency. TF-IDF was used for rule text, and feature engineering reduced memory usage by 66.9% (740MB → 245MB).
- Trained LightGBM, CatBoost, XGBoost with 5-fold cross-validation and hyperparameter tuning, using StratifiedGroupKFold for stable sampling. A model ensemble (0.72 * Model_1 + 0.38 * Model_2) improved RMSE by 2.1%, reaching 0.5595.
- This project optimized MCTS selection strategies, enabling efficient processing of large datasets and improving game AI decision-making.

Kaggle Competition: Learning Agency Lab – Automated Essay Scoring 2.0 (Silver Medalist) 2024.04 - 2024.07

- Engineered multi-dimensional text features (TF-IDF, CountVectorizer, grammatical complexity, sentiment analysis). Trained and optimized LightGBM models with a custom weighted Kappa loss function and cross-validation to enhance predictive robustness.

SKILLS & OTHERS

- **IT:** Skilled in MS Office Suite, Excel VBA ; Proficient in Python (NumPy, Pandas, Pytorch, Sklearn), Matlab, Stata, R Studio, SQL, Tableau, Basic C Language and C++ for data processing and developing
- **Languages:** Chinese Mandarin (Native), and fluent in English with good communication skills upon studying abroad for 3+ years (TOEFL: 110/120), Latin (Learned)
- **Interests:** Hulusi (level 6), saxophone (level 4), good at table tennis, badminton and E-Sports;
- **Other Experience:** American Go Association Member (AGC), Go Club of UC Davis (2024 CIGL 2nd Place by ACGA), Chess Club of UC Davis