# HAIJIAN WU

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## EDUCATION

**Columbia University, School of Engineering and Applied Science & Columbia Business School** New York, NY
**Master of Science in Business Analytics** Aug 2022 - Dec 2023
GPA: 4.09/4.00, Benjamin Miller Memorial Fellowship

**University of Michigan at Ann Arbor, College of Literature, Science, and the Arts** Ann Arbor, MI
**Bachelor of Science in Mathematics and Data Science** Aug 2019 - May 2022
Minor in Physics and Creative Writing
GPA: 3.99/4.00, Graduation with Highest Distinction, Phi Kappa Phi, University Honors, James B. Angell Scholar

## SKILLS

- Programming/Tools: Python (NumPy, Pandas, Matplotlib, Seaborn, PyTorch, TensorFlow), Matlab, R, C++, Tableau
- Quantitative Analysis: Derivative Pricing, Asset and Risk Management, Volatility Analysis, Time Series Analysis, Optimizations, Structured & Hybrid Products, Term Structure Models, Probability Theory and Stochastic Modeling
- Machine Learning: Regressions, Random Forest, Clustering, Neural Network, LLM, Reinforcement Learning

## PROFESSIONAL EXPERIENCE

**Kylli Inc.** Santa Clara, CA
*Quantitative Asset Manager* Mar 2024 - Present

- Conducted financial modeling and **pro forma financial analysis** to assess **loan repayment capacity** and evaluate **CMBS financing structures** for AUM of approximately **$350 million**, calculating return metrics and determining the optimal mix of debt and equity
- Performed detailed loan analysis using loan amortization schedules and cash flow projection models to assess repayment capacity

**J.P. Morgan Chase & Co.** New York, NY
*Quantitative Analytics Summer Associate* Jun 2023 - Aug 2023

- Conducted and improved a **BERT-based Question Answering Model** to diminish subjectivity in generating the numerical value distributions for key features of risk management models (e.g., system outage) and to find appropriate parameters for the models
- Independently reimplemented and validated the Bayesian financial model's mathematical inference section using Python and **Monte Carlo simulations**, ensuring pricing and risk estimating accuracy by conducting **Kolmogorov-Smirnov tests** on the simulation results
- Assisted in developing and evaluating a thematic financial derivative model using finite difference methods, which improved computational efficiency, reduced errors for a $200 million portfolio, and evaluated risk via Value at Risk (VaR) at various quantiles

**China International Capital Corporation, Wealth Management** Shenzhen, China
*Financial Data Analyst Intern* May 2021 - Aug 2021

- Optimized equity-based and hybrid product portfolios using convex algorithms, **Markowitz Mean-Variance** analysis, and the Black-Litterman model with trader and economist insights, resulting in a $2.4 million profit improvement in the back-testing system
- Utilized **ridge and lasso regressions** to analyze the investment data of major portfolios from 2020 to 2021 on the mobile platform and forecast the future portfolio return and volatility, providing the appropriate spreads and saving about 1 million dollars to trading teams
- Developed and optimized data management pipelines and an automated weekly reporting system using Pandas and MySQL

## RESEARCH AND ACTIVITIES

**IMC Trading Prosperity Trading Competition** New York, NY
*Competition Participant* Mar 2024 - Mar 2024

- Utilized various trading strategies, Monte Carlo simulations and game theory for trading competitions, and developed a comprehensive back-testing system with visualization tools to analyze profit & loss, position changes, volatility, and other key metrics

## PROJECT EXPERIENCE

**Columbia University** New York, NY
*Researcher, Pricing of an Exotic Derivative Contract* Oct 2023 - Dec 2023

- Applied **Hull-White short rate Model** and the log normal model to price and calibrate for a Quanto Contract linked to EUROSTOXX50 based on the data from **Bloomberg Terminal** spanning 2018-2023 and visualize the final results of 100 simulations
- Employed **Black-Scholes model, ARCH model, and Hull-White model** to model and analyze historical volatility, local implied volatility, and stochastic volatility, supporting various simulation results based on different riskiness assumptions

**EnergyLive and Columbia University** New York, NY
*Researcher, Forecasting of Greek Energy Market ISP2 Energy Price* Jan 2023 – May 2023

- Implemented **ETL data pipelines** and developed a local relational database, leveraging online APIs to integrate multiple data types, ensuring timely and accurate migration of over 20,000 observations with weekly updates
- Proposed and designed a **DNN-LSTM architecture** to model both non-sequential and sequential relationships in time series data, reducing the mean absolute error of intraday price predictions by **about 12%** and effectively analyzing seasonal patterns

**Columbia University and European Investment Bank** New York, NY
*Researcher, Crop Yield Prediction in United States* Sep 2022 – Jan 2023

- Improved **CNN-RNN** models with **LSTM structure** for soybean data collected from 1088 counties across past 30 years to forecast soybean yield and optimize hyper-parameters, **decreasing RMSE by 12%** and supporting pricing process of related derivatives
- Collaborated in analyzing the business and financial impact of the model, such as application in pricing strategy of crop commodities by providing the forecasting of the United States crop quantity, and designed the basic architecture of **GNN improvement**