NYU | COURANT INSTITUTE OF MATHEMATICAL SCIENCES

MAY 2024

RESUME BOOK

FULL-TIME CANDIDATES

MATHEMATICS IN FINANCE

Master of Science Program

DEAR COLLEAGUE,

We are pleased to share with you the resumes of the graduate students in NYU Courant's *M.S. in Mathematics in Finance* who are on the job market and looking for full-time positions.

We believe our students are the most astute, most capable, and best trained group of students of any program. The resumes you find in this resume book describe their distinguished backgrounds. For the past years we have one of the highest placement records for internships and full-time positions. Our students enter into front office roles such as trading, portfolio or risk management, on the buy and the sell side. Their computing, quantitative modeling, and machine learning skills, as well as their hands-on practical experience, makes them productive from day one.

Our graduate-level curriculum is dynamic and challenging. For example, the first semester investment course does not end with CAPM and APT, but is a serious data- driven course that examines the statistical principles and practical pitfalls of covariance matrix estimation and portfolio construction. As part of our core curriculum, students learn the modern tools of computer science, machine learning and data science as they are used in the financial industry today. Our advanced electives cover cutting-edge topics in alternative data, algorithmic trading, computational statistics, derivatives pricing, financial machine learning, risk and portfolio management, and XVA. Our instructors are senior industry professionals and full-time faculty from NYU Courant, the top ranked department worldwide in applied mathematics. You can find more information about our curriculum and faculty at **math-finance.cims.nyu.edu/**

Sincerely yours,

Petter Kolm
DIRECTOR

Jonathan Goodman
CHAIR

Leif Anderson
INDUSTRY ADVISOR

THE CURRICULUM HAS FOUR MAIN COMPONENTS

For more information about the program curriculum and course descriptions, visit
math.nyu.edu/financial_mathematics/academics/courses

01. FINANCIAL THEORY, STATISTICS, AND FINANCIAL DATA SCIENCE

These courses form the core of the program, covering topics ranging from equilibrium theory, Black-Scholes, Heath-Jarrow- Morton, linear regressions, covariance matrix estimation to modern machine learning techniques and how they are used in quantitative finance.

02. PRACTICAL FINANCIAL APPLICATIONS

These classes are taught by industry specialists from prominent Wall Street firms. They emphasize the practical aspects of quantitative finance, drawing on the instructor's subject matter experience and expertise.

03. MATHEMATICAL TOOLS

This component provides appropriate mathematical background in areas like stochastic calculus and partial differential equations.

04. COMPUTATIONAL SKILLS

These classes provide students with a broad range of software skills in Java and Python, and facility with computational methods such as optimization, Monte Carlo simulation, EM-type algorithms and the numerical solution of partial differential equations.

PRACTICAL TRAINING

In addition to coursework, the program emphasizes practical experience. All students do a capstone project (the Project and Presentation course), mentored by finance professionals. Most full-time students do internships during the summer between their second and third semesters.

OUR CURRICULUM

	1ST SEMESTER	2ND SEMESTER	3RD SEMESTER
FINANCIAL THEORY, STATISTICS, AND FINANCIAL DATA SCIENCE	Financial Securities and Markets Risk and Portfolio Management Data Science and Data-Driven Modeling	Dynamic Asset Pricing Machine Learning & Computational Statistics Market Microstructure Advanced Topics In Equity Derivatives Interest Rate & Fx Models	Advanced Statistical Inference and Machine Learning Trends in Financial Data Science Time Series Analysis & Stat. Arbitrage Alternative Data in Quantitative Finance
PRACTICAL FINANCIAL APPLICATIONS		Active Portfolio Management Modeling and Risk Management of Bonds and Securitized Products Trading Energy Derivatives Algorithmic Trading & Quantitative Strategies Advanced Risk Management	Fixed Income Derivatives: Models & Strategies In Practice Trends In Sell-Side Modeling: XVA, Capital and Credit Derivatives Cryptocurrency and Blockchains: Mathematics and Technologies Project & Presentation
MATHEMATICAL TOOLS	Stochastic Calculus		
COMPUTATIONAL SKILLS	Computing in Finance Data Science and Data-Driven Modeling	Scientific Computing in Finance	

For more information about the program curriculum and course descriptions, visit
math-finance.cims.nyu.edu/academics.

YANG BAI

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EDUCATION

Expected 01/24	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- ***Expected Coursework:*** stochastic calculus, statistical inference, machine learning, time series analysis, portfolio optimization, derivatives pricing and hedging, financial data science

09/18 - 07/22	**FUDAN UNIVERSITY**	Shanghai, China

B.S. in Mathematics
- ***Coursework:*** partial differential equations, game theory, Brownian motion, optimal control theory, convex optimization, computational statistics, numerical analysis, mathematical finance

EXPERIENCE

06/23 - 08/23	**TCW GROUP**	New York, NY

Quantitative Analyst Intern, Emerging Markets Equities Group (Python)
- Extracted data from Bloomberg using BQL query; constructed database of 95 predictive factors - updated automatically each month for emerging markets stock pool
- Implemented neural network model to interpret monthly returns with predetermined factors
- Constructed portfolio that achieved 1.17 annualized Sharpe ratio (transaction cost considered)

09/21 - 11/21	**GUOTAI JUNAN ASSET MANAGEMENT**	Shanghai, China

Quantitative Analyst Intern, Proprietary Securities Department (Python)
- Analyzed macro movements of gold price from macroeconomic perspectives
- Established cointegration relationship between gold price and US CPI and specified Error Correction Model to describe short-term adjustment after deviating from long-term equilibrium
- Used Dynamic Factor Model to pick 10 out of 6000 latent factors to nowcast trend of gold price

05/21 - 08/21	**EVERBRIGHT SECURITIES**	Shanghai, China

Quantitative Analyst Intern, Financial Engineering Group (Python)
- Added ESG factor into Fama-French 5 factor model and back-tested strategy performance; concluded that ESG factor consistently provides excess returns from A-shares
- Decomposed ESG rating divergence into distributions of measurement, weight and scope
- Integrated ESG into CAPM model by reforming utility function; arrived at optimal portfolio

PROJECTS

10/22 - 12/22	**NEW YORK UNIVERSITY**	New York, NY

Exotic Option Pricing with Monte Carlo Simulation
- Derived 3-dimensional stochastic process to simulate movement of Nikkei-225 index, forward rate and risk-free interest rate, using HJM framework, Hull-White and Vasicek models
- Extracted historic trading data with FRED API; performed data cleaning and transformation
- Calibrated mean reversion coefficient in Vasicek model with Levenberg-Marquardt algorithm

02/21 - 10/21	**FUDAN UNIVERSITY**	Shanghai, China

Application of Convolutional Neural Network in Yield Surface Prediction
- Defined yield surface of corporate bonds by adding credit rating dimension to yield curves
- Applied convolutional neural network to predict yield rates with predetermined maturities yield 1 week into future; achieved higher accuracy than that of Nelson-Siegel model

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, MATLAB, SQL
Languages: English (fluent), Mandarin (native)
Certification: Bloomberg Market Concepts

HUYI CHEN

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EDUCATION

Expected 12/23 **NEW YORK UNIVERSITY**   New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* Black–Scholes model, volatility model, Monte Carlo simulation, pricing exotics, algorithmic trading, covariance matrix estimation, Black-Litterman model, machine learning, object-oriented programming (Java), market microstructure

09/16 - 06/20 **WUHAN UNIVERSITY**   Wuhan, China
B.S. in Mathematical Finance and B.S in Mathematics
- *Coursework:* linear algebra, probability theory, statistics, real analysis, optimization, random forest, differential equations, numerical analysis, regression, C++ programming, data structures
- *Honors/Awards:* national scholarship (top 5%), first prize of 10th National College Student Mathematics Competition

EXPERIENCE

08/23 - Present **TOPSPERITY SECURITIES CO. LIMITED**   Shanghai, China
Quantitative Research Intern (Python)
- Engineered high-performance trading strategies for futures markets using Python
- Implemented and optimized cointegration arbitrage strategies for bond futures, utilizing ARIMA model to enhance accuracy of cointegration coefficient estimation
- Researched factor timing strategies for futures, focusing on volume-to-open-interest ratios and speculative-hedging metrics, significantly boosting strategy performance

10/19 - 01/20 ***ZMATE QUANTITATIVE TECHNOLOGY LTD***   Shenzhen, China
Quantitative Research Intern (Python)
- Developed 6 trading strategies for cryptocurrency and stocks with Python; unearthed and rigorously tested multiple factors for trading strategies
- Optimized strategy execution performance, improving database communication, enhancing visualization infrastructure, and streamlining log systems
- Improved performance of stock selection program based on CAPM by introducing mixed integer programming, increasing Sharpe ratio by 6% and reducing maximum drawdown by 5%
- Prepared technical aspects of presentation to security company clients to better demonstrate technical implementation; succeeded in selling them stock selection program

PROJECTS

09/21 - 02/22 **CALIFORNIA INSTITUTE OF TECHNOLOGY**   Remote
Performance Comparison of BS and Heston Models in Options Pricing (Python, C++)
- Collected stock and options data with Python; calibrated market parameters and priced options with Black-Scholes and Heston models
- Fitted parameters by minimizing prediction errors of option prices with hybrid schemes
- Accelerated calibration by introducing C++ library SWIFT based on wavelet decomposition
- Compared performance of Black-Scholes and Heston models by calculating prediction error on test set and conducting delta hedging for specific portfolios

07/21 - 08/21 **UBS SECURITIES CO. LIMITED**   Remote
Pair Trading Strategies Based on Cointegration Arbitrage (Python)
- Conducted data cleaning for government bond futures using Python; applied cointegration tests
- Wrote fully functional backtesting program with Python to implement statistical arbitrage strategies for Treasury bond futures based on residual deviation signal
- Used moving average and Kalman filter to better fit time-varying strategy parameters, which significantly improved strategy performance in most cases
- Optimized code through heavy vectorization; boosted running speed 22-fold

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, C++, Java, MATLAB, Mathematica
Languages: English (fluent), Mandarin (native)

YONGYAO CHEN, FRM

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* market microstructure, trading energy derivatives, risk and portfolio management, equity derivatives, dynamic pricing, scientific computing, algorithmic trading, stochastic calculus

08/16 - 06/20	**NANYANG TECHNOLOGICAL UNIVERSITY**	Singapore

B.ENG. in Electrical and Electronic Engineering *(Honors, Highest Distinction)*
- *Coursework:* linear algebra, probability & statistics, numerical methods, differential equations, data structure & algorithms, intelligent system design, business finance, accounting fundamentals

02/18 - 07/18	**ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL)**	Lausanne, Switzerland

Semester Exchange with Scholarship

EXPERIENCE

	MORGAN STANLEY	Hong Kong SAR
06/23 - 08/23	**Summer Associate, Quantitative Research** (Equity Algorithmic Electronic Trading)	

- Researched smart meta algos for intra-order algo selection and switching at IED MSET desk
- Reconstructed historical order trading micro-process and built automated daily reporting pipeline in production environment to provide trading visualization and performance analytics
- Designed simulation framework that integrates production model and local state machine proxy to replay existing orders and experiment on new intra-order algo switching strategies
- Proposed new meta algo models based on intraday momentum and reversion effect as well as evidence from simulations; achieved arrival cost optimization and tail risk control

	JPMORGAN CHASE & CO.	Singapore
09/20 - 07/22	**Analyst, Software Engineer** (Asset and Wealth Management)	

- Created data-centric investment technology that facilitates portfolio management and trading decisions for private bank's internal investors and financial advisors
- Contributed to development of new global strategic data framework that consolidates and processes data from all accounting systems, using big data, cloud, and automation technologies
- Expanded portfolio analytics space with new features (e.g., trending trades analysis, large cash position indicator, overdraft alert, client service communication, morning briefs, trade idea feeds)
- Designed and implemented novel automated monitoring system that surveys data pipelines; it now serves as primary platform for service-line agreement management internationally

06/19 - 08/19	**Summer Analyst, Software Engineer** (Corporate and Investment Banking)

- Collaborated with London commodities team to develop new Python-based software for base metal post-trade customer information maintenance in firm's cross-asset platform, Athena

	ERNST & YOUNG SOLUTIONS LLP	Singapore
01/19 - 05/19	**Advisory Services Intern**	

- Facilitated business design, implementation, and data migration of Sales & Distribution module in largest global SAP S/4HANA ERP project at EY Singapore in 2019 for client, DyStar Group

PROJECT

08/19 - 04/20	**NANYANG TECHNOLOGICAL UNIVERSITY**	Singapore

Onboard 3D SLAM for AGV Localization - With Delta Electronics, Inc. (C++, Linux, ROS)
- Designed thematic segmentation system to identify human objects in complex 3D point clouds utilizing anthropometric geometry and support vector machine for automated guided vehicles

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, kdb+/q, Unix Shell, Java (Spring), Scala (Hadoop/Spark), C++, SQL
Languages: English (fluent); Mandarin (native); Japanese and French (elementary)
Affiliations/Certifications: Certified Financial Risk Manager (FRM); Passed CFA Exam Level II (November 2021)
Activities: NTU Chinese Orchestra, Two-String Fiddle Performer (Singapore, Taipei); Singapore Marathon (2017, 2019)

LAKSHAY GARG

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY** **The Courant Institute of Mathematical Sciences** **M.S. in Mathematics in Finance**	New York, NY

- *Coursework:* stochastic optimal control, market impact model, linear regression, PCA, active portfolio management, random matrix theory, dynamic programming, random forest, xgboost, OpenMP, MPI, optimization

07/13 - 07/17	**INDIAN INSTITUTE OF TECHNOLOGY** **B.Tech in Mathematics and Computing**	Guwahati, India

- *Coursework:* linear algebra, numerical methods, stochastic calculus, time series analysis, linear regression, SVM, PCA, data structures and algorithms, Monte Carlo simulation

EXPERIENCE

06/23 - 08/23	**MORGAN STANLEY** **Equity Desk Quant, Summer Associate (C++, Python)**	New York, NY

- Improved Cliquet pricing model; developed tools that investigated calibration accuracy/stability
- Analyzed calibration outliers and identified market conditions in which model performed poorly
- Fixed model by improving optimizer for fast and robust calibration
- Presented to Institutional Equity Derivatives leaders and teams; pushed changes into production

11/18 - 06/22	**NOMURA SERVICES INDIA PVT. LTD.** **Model Risk Associate (C++, Python)**	Mumbai, India

- Validated new products and model changes in FX/IR; evaluated ad hoc trade approvals
- Approved American barriers for scripted FX options in local vol and local stochastic vol
- Validated cap floor for risk-free rates (e.g., SOFR, OIS) as part of IBOR migration
- Created restriction monitoring functionality for FX

07/17 - 11/18	**FIDELITY INVESTMENTS** **Software Engineer**	Bengaluru, India

- Developed multiple APIs and web services for brokerage firm with SOAP and WSO2
- Built on Ethereum platform to develop DApps for reconciliation problems of transfer agents

PROJECTS

08/22 - Present	**NEW YORK UNIVERSITY** **DNN for Stochastic Optimal Control Problem in Finite Horizon (Python)**	New York, NY

- Created performance iteration (NNContPI) and hybrid iteration (Hybrid-Now) algorithms
- Analyzed performance of algorithms for 10-D linear quadratic and 1-D call option hedging cases
- Compared results with analytic solutions by solving Riccati equations and Black-Scholes price
- Tuned hyper-parameters for stable and fast convergence

FlashAttention and Extensions (C++)

- Implemented FlashAttention algorithm; "fused" dot-product attention algorithm
- Improved run time by ~ 2.5x over standard attention for backward and forward passes
- Leveraged max cache utilization to overcome technical challenge of quadratic memory access
- Developed parallel version with OpenMP; improved performance by factor of ~20 with 48 cores
- Extended algorithm to develop bespoke sparsity patterns (block-sparse and circulant-sparse)

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, C++, SQL
Languages: English (fluent), Hindi (native)

JIONGYANG (MAXWELL) HE

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Previous Coursework:* OOP and data structure in Java, risk and portfolio management, financial securities and markets, stochastic calculus, machine learning, deep learning, dynamic asset pricing, algorithmic trading, active portfolio management, cryptocurrency and blockchains
Forthcoming Coursework: scientific computing, time series analysis, statistical arbitrage, trends in financial data science

09/17 - 07/21	**PEKING UNIVERSITY**	Beijing, China

B.S. in Mathematics and Applied Mathematics
- *Core Coursework:* ODE, PDE, real analysis, complex analysis, topology, functional analysis, differential manifolds, Riemann-Roch Theorem, mathematical logic, probability theory, applied stochastic process, combinatorics, data structure and algorithm, machine learning

INTERNSHIP

05/23 - 08/23	**QUANTBOT TECHNOLOGIES**	New York, NY

Quantitative Researcher Intern (Python, Linux)
- Determined best rollover strategy of 158 futures worldwide and built machine to automatically predict next trading day's liquid contracts for each futures on every trading day
- Constructed 6 long-lasting signals using level 2 TAS order book of 18 futures in CME; built framework to backtest signals in dollar returns and spread returns at various times
- Predicted short-term returns of most liquid contract (by above machine) of each futures using simple sum of TAS signals and achieved Sharpe ratio of at least 2.67 in each out-sample year

11/21 - 04/22	**DYNAMIC TECHNOLOGY LAB**	Shanghai, China

Quantitative Researcher Intern (Python, Linux)
- Constructed 100+ features from imbalance messages in opening auction and picked 46 from them; used LightGBM to predict short-term returns after market open in 1 Chinese stock market
- Created engine that picked factors by rank IR to predict short-term returns after market open, using linear regression after symmetric orthogonalization in 2 US stock markets
- Built long-short strategy based on above models and achieved stable performance with overall PnL/trading values > 0.001 on test sets

07/21 - 09/21	**JQ INVESTMENT MANAGEMENT**	Shanghai, China

Quantitative Researcher Intern (Python, Linux)
- Constructed order book matching engine with high-frequency message-based data
- Conducted research on market microstructure, analyzed order book characteristic of ShenZhen stock market and found significant patterns in orders with 3 different kinds of sizes

01/20 - 02/20	**RUITIAN INVESTMENT MANAGEMENT**	Shanghai, China

Quantitative Researcher Intern (Python, Linux)
- Used NumPy and Pandas packages and Linux operating syntax to backtest factors and models
- Researched on numerical optimization and discussed paper on that with mentor

HONORS

11/16	Gold Medal (61st in China) in China Mathematics Olympiad (CMO)
10/15 & 10/16	First Prize in The National High School Mathematics League

ADDITIONAL INFORMATION

Programming Languages: Python, C++, Java
Languages: English (fluent); Mandarin (native); Shanghainese (native)
Affiliation/Certification: C++ Programming for Financial Engineering from QUANTNET INC; Certificates of Completion for Akuna Capital Options 101 and 201 Courses (advanced to final round interviews)
Interests: Weiqi/Go (1 dan); Electronic Organ (Grade 10); Waltz (2nd in PKU dance competition); Hearthstone (once ranked 12th in Chinese server); Texas hold'em (2nd place in tournament held by Flow Trading)

IONKENG HO

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- ***Expected Coursework:*** currency derivatives, interest rate models, convex optimization, NLP, deep learning, time series, reinforcement learning, Fama-French, Almgren-Chriss

09/18 - 06/22	**UNIVERSITY OF CALIFORNIA SANTA BARBARA**	Santa Barbara, CA

B.S. in Physics and B.S. in Financial Math & Statistics
- ***Coursework:*** multivariable calculus, probability and statistics, linear algebra, ODE & PDEs, complex analysis, numerical methods, regression, stochastic process, machine learning, special relativity, Hamiltonian mechanics, Schrödinger equation, Maxwell equations
- ***Honors/Awards:*** Honors (Top 8% GPA in College of Letters and Science)

EXPERIENCE

06/23 - 08/23	**ZORRO CAPITAL**	Shenzhen, China

Quantitative Researcher Intern
- Collaborated with 2 colleagues and conducted fundamental research on 50 Web 3.0 projects (e.g., DeFi, Metaverse, NFT) and their corresponding cryptocurrencies; produced detailed report
- Used daily historical trading data from Binance and analyzed correlation matrices, emphasizing key tokens; identified high correlations to structure hedged portfolios for further research
- Constructed portfolio with 20%-40% annualized return and 15%-18% max drawdown; backtested with several common indicators (e.g., RSI, MACD) over 2-year period
- Developed a new hourly-frequency trading signal; attained 57.9% annualized return and 1.64 Sharpe ratio during 2-year backtest period, with max drawdown 13.3%

PROJECTS

02/23 - 05/23	**NEW YORK UNIVERSITY**	New York, NY

Optimal Trading Execution & Market Impact Model (Python)
- Prepared, adjusted, and cleaned high-frequency TAQ (trade and quote) data on all stocks on NYSE on business days from 06/20/2007 to 09/20/2007
- Analyzed serial correlation in high-frequency data to determine optimal frequency for traded price sampling that wasn't affected by bid-ask bounce
- Constructed market impact model by deriving statistically significant parameters and employing non-linear regression techniques; confirmed residuals' homoscedastic nature
- Validated reliability of implemented classes and functions through rigorous unit testing

04/22 - 06/22	**UNIVERSITY OF CALIFORNIA SANTA BARBARA**	Santa Barbara, CA

Solving Acoustic Wave Equations Using Crank-Nicolson Method (Python)
- Proved stability of Crank-Nicolson Method; used it to write simulation of wave equation into linear system of equations in lexicographical order
- Applied ADI algorithm to solve linear system; obtained approximate solution, which achieved less than 0.1% deviation from exact solution

09/21 - 12/21	**Applying Machine Learning in Finding Relationships Between Poverty and Education Level (R)**

- Pruned US county-level education data using PCA to 12 PCs while capturing 90% of variance
- Applied decision tree and logistic regression to pruned data; observed that poverty level of counties was strongly related to number of people who had less than a high school diploma
- Used cross-validation to optimize parameters; reduced test mean square error by 20%

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Java, Python, R
Languages: English (fluent), Cantonese (native), Mandarin (native)
Activities: 2018 International Physics Olympiad Macau Team; won 4th place in UCSB poker tournament

SAMAR HOLKAR

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EDUCATION

Expected 12/23   **NEW YORK UNIVERSITY**   New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* mean-variance optimization, Black-Scholes pricing, optimal execution, machine learning, linear regression, equity derivatives hedging, time series analysis, option greeks, securitized derivatives

08/13 - 05/17   **INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**   Roorkee, India
B.Tech. in Computer Science and Engineering (awarded 09/17)
- *Coursework:* probability (basics), data structures, algorithms, deep learning

EXPERIENCE

08/23 - Present   **WOLFE RESEARCH, LLC**   New York, NY
Quantitative Research Intern - QES Research (Python)
- Conducted stock selection based on impact analysis of trademark protection on profits, creditworthiness, and insights from USPTO Trademark Assignment dataset

06/23 - 08/23   **U.S. BANK**   New York, NY
Quantitative Modeling Intern - Derivatives Portfolio Management Risk (Python)
- Analyzed energy portfolios under distressed market scenarios like Greek Debt Crisis and Asian Crisis

04/19 - 06/22   **GOLDMAN SACHS**   Bangalore, India
Associate - Equity Derivatives
- Built initial margin model for U.S. equity derivatives flow portfolio, reducing funding costs by $3 million
- Optimized market risk on single stock options using equity and volatility based risk factors to offer clients optimal margins on prime brokerage portfolios
- Adapted prime brokerage margin model for single stock equity derivatives franchise trading business to derive credit risk benchmarks for U.S. clients
- Structured corporate trade models to optimize collateral and margin constraints for clients
- Collaborated with trading desk to analyze funding costs and risks for high notional trades

06/17 - 03/19   **PAYTM**
(FinTech startup)   New Delhi, India
Software Engineer
- Created scalable rule-based engine standardizing financial products; streamlined operational design, while cutting costs and enhancing user experience through interactive design flow

PROJECTS

09/22 - Present   **NEW YORK UNIVERSITY**   New York, NY
Quantitative Research Projects, The Courant Institute of Mathematical Sciences (Python)
- Implemented strategy to trade multi-asset ETF baskets by generating sparse mean-reverting portfolios using Box-Tiao canonical decomposition
- Priced equity rate hybrid security; structured payoffs marking LIBOR and Nikkei-225; used Raw-SVI to simulate arbitrage free volatility surface
- Built impact model to measure implicit trading costs based on Almgren, et al. (2005), using NYSE Trades and Quotes (TAQ) dataset on S&P 500 stocks

08/16 - 02/17   **INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**   Roorkee, India
Text-Image Synthesis with Uni-Skip Vectors (Python, Deep Learning)
- Designed text-to-image learning model using text data with 1M-word vocabulary, producing high-level representations with distributed text encoder conditioned on GANs

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, C/C++, Javascript, Slang

XIXIANG HU

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* stochastic calculus, XVA, fixed income derivatives, trading energy derivatives, capital and credit derivatives, time series analysis, derivatives pricing, interest rate model

09/21 - 09/22	**LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE (LSE)**	London, UK

M.S. in Data Science
- *Coursework:* time series, SVM, random forest, XGBoost, lasso, ridge regression, Monte Carlo, principal component analysis, Q-learning, PySpark, distributed computing

09/17 - 06/21	**SOUTHWEST UNIVERSITY OF FINANCE AND ECONOMICS**	Chengdu, China

B.S. in Computer Science
- *Coursework:* corporate finance, financial derivatives, Java, database, statistics, data structures, probability, algorithms, machine learning, linear algebra, Hadoop

EXPERIENCE

06/23 - 08/23	**ANZHI CAPITAL**	Shanghai, China

Quantitative Research Intern (Python)
- Aggregated convertible bond strategies data with Python, calculating value and proportion for each bond, stock, and future; analyzed fund allocations across various industries
- Wrote fully functional backtesting program for new strategies, obtaining statistical indicators for certain periods and generating net value chart
- Studied HFT papers; used continuous Markov chain model, jointly modeling market order

07/21 - 09/21	**CAITONG SECURITIES**	Chengdu, China

Internship (Python)
- Evaluated performance of diverse strategies across time; assessed economic and market conditions under which each strategy exhibited strong results
- Constructed forecasting model based on GARCH for returns; visualized portfolio data

PROJECTS

09/23 - present	**NYU COURANT**	New York, NY

Automatic Hedging Strategy for 1-month and 3-month Term-SOFR Reset-Risk (Python)
- Replicated the published Term-SOFR. Analyze tick-by-tick data to replicate Term-SOFR and use linear optimization to forecast optimal overnight SOFR rates
- Designed algorithm to autonomously hedge against Term-SOFR reset risk. Utilizing TWAP principles, adjusting weights dynamically across different time frames by historical trading volume; final hedging error should within +/- 0.15bps of CME's daily Term-SOFR rates

12/21 - 08/22	**LSE & SIEMENS ADVANTA CONSULTING**	London, UK

Inventory Optimization (Python)
- Applied ARIMA and ARIMAX time series models and machine learning methods (Prophet, LSTM) to simulate and predict product order demand over forthcoming 3 months
- Constructed environment for inventory management process; used reinforcement learning methods, DQN and Dueling DQN, to establish optimal reorder points strategy

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, R, C, SQL
Languages: English (fluent), Mandarin (native)
Honor & Certifications: 1st in LSE and IBM "Practitioner Challenge Competition," Passed FRM Exam, Part I

YUE (RAY) HU

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* Monte Carlo, derivatives pricing & hedging, energy derivatives trading, interest rate & FX model, Black-Scholes, time series analysis, Fourier analysis, arbitrage pricing theory

09/17 - 04/22	**UNIVERSITY OF WATERLOO**	Waterloo, Canada

B.Math. in Mathematical Finance
- *Coursework:* linear algebra, partial differential equations, Bayesian statistics, probability theory, Itô's lemma, CAPM, options, data structure (Python), stochastic processes, linear regression
- *Honors:* Dean's Honors (top 5% of GPA in department), President's Scholarship

EXPERIENCE

06/23 - Present	**NUMERIX**	New York, NY

Financial Engineering Intern (Python, Excel)
- Developed FX and equity pricers, implementing pricing models (Black, Heston, Bates, Dupire)
- Replicated algorithms in academic research on wide array of topics (e.g., American Monte Carlo, corridor variance swaps, FX swaps, Brownian bridge for barrier option, BGK model)
- Programmed forward and backward Monte Carlo scripts for financial instruments (e.g., vanilla, Cliquet, barrier, seasoned Asian, forward-starting options) using Excel and Python SDKs

03/23 - 05/23	**GROW INVESTMENT GROUP**	Shanghai, China (remote)

Quantitative Strategist Intern (Python, Excel)
- Conducted research to identify key parameters that signaled inflection points in equity strategies, enabling optimized decision-making in portfolio management
- Analyzed institutional investors' preferences (e.g., with momentum, number of reports, volume) for multiple industries; compared present to historical preferences, driving investment decisions
- Created valuation method that assessed performance of over 3K PMs; actively identified top 10, providing long/short suggestions based on PMs' abilities in industry rotation strategy

03/22 - 04/22	**CITIC SECURITIES**	Shenzhen, China (remote)

Equity Research Analyst Intern
- Analyzed target companies' financial statements and industries' business cycles and future trends
- Made predictions in new-generation education industry (e.g., AI and new vocational learning)

09/21 - 12/21	**AVIVA CANADA**	
	(2nd largest property and casualty insurance company in Canada)	Toronto, Canada

Actuarial Intern, Group and High Net Worth (Python, Excel)
- Developed credit analysis for insurance brokers to determine whether to apply more risk factors
- Improved efficiency of pricing tools built in Excel by 30% through automation and optimization
- Consolidated group case database in Python, with over 10K observations and 500K features
- Drafted tier analysis for top corporate entities; prepared and presented rate adjustment strategies

PROJECTS

08/21 - 10/21	**ARTIFICIAL INTELLIGENCE FINANCE INSTITUTE (AIFI)**	New York, NY

Impact of COVID-19 on Perth Housing Prices: A Machine Learning Perspective (Python)
- Conducted statistical analysis and model validation with TensorFlow and scikit-learn
- Identified several new and original parameters after testing hundreds of transformed ones
- Applied CatBoost regression for price forecasting, and difference-in-difference (DID) methods for impact evaluation
- Wrote manuscript (independently) that was published by 7th International Conference on Financial Innovation and Economic Development (2022)

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, MATLAB, SQL, R, C#
Honors: Bronze Award, Canadian Open Mathematics Challenge; got invited to Canadian Olympiad Math Training Team
Interest: China National Flight Simulation Competition (4th place out of 1K+)

ZHENQI (HARRY) JING

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* data-driven modeling, object-oriented programming (Java), scientific computing (Python), risk management, supervised and unsupervised learning, dynamic asset pricing, interest rate and foreign exchange models

01/19 - 04/21	**UNIVERSITY OF MICHIGAN, ANN ARBOR**	Ann Arbor, MI

B.S. in Mathematics, Economics
- *Coursework:* simple linear regression, multiple regression analysis, probability, numerical methods, interest theory, term structure, CAPM, binomial model
- *Honors:* Graduation With Highest Distinction (top 3% of class)

08/17 - 12/18	**CASE WESTERN RESERVE UNIVERSITY**	Cleveland, OH

Applied Mathematics Studies

EXPERIENCE

02/22 - 07/22	**HIGH HOPE WISDOM INVESTMENT**	Nanjing, China

(Asset management firm with +$1B in AUM)
Quantitative Research Intern (Python)
- Studied "Likely Gains From Market Timing" paper, developed math derivations, and explained findings to team to offer perspective for China A-share performance
- Analyzed intraday/interday prices and trading volumes of China A-shares; identified pattern variations; studied papers about explanations; assessed implications for investments
- Applied research-based PB decomposition method to China A-shares; identified its potential significance in constructing portfolios to outperform market
- Evaluated performance of 6 financial factors during differently performing market periods; identified significant persistence of SML factor
- Conducted literature reviews on different topics (e.g., measures for economic policy uncertainty; patterns in trading volume and return volatility)

PROJECTS

11/22 - 12/22	**NYU COURANT**	New York, NY

Pricing Routine for an Exotic Option (Python)
- Changed measure with Girsanov theorem; derived new stochastic dynamics of Nikkei-225 spot price under framework of quanto products with 2 currencies
- Applied martingale modeling on LIBOR forward rate, taking Heath–Jarrow–Morton drift condition into account to specify volatility structure given forward rate dynamics
- Used Monte-Carlo to price contract that has two above underlying assets

10/19 - 11/19	**UNIVERSITY OF MICHIGAN, ANN ARBOR**	Ann Arbor, MI

Data Analytics (STATA)
- Replicated Tennessee Student Teacher Achievement Ratio Project to study bias caused by reverse causality and benefits of random experiments
- Investigated effect of seatbelt law introduction in California with time series regression models; used dummy variable to detect seasonal patterns in accidents

03/19 - 04/19	**Creative AI Learning Models Based on NLP (Python)**	Ann Arbor, MI

- Trained Beatles song lyrics using n-grams language modeling

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, R, STATA
Languages: English (fluent), Mandarin (native)
Activities: Modern Algebra and Numerical Methods Grader, University of Michigan

SUSHMANTH KAKULLA

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EDUCATION

09/22 - 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* stochastic calculus, machine learning, Black Scholes, Monte Carlo simulation, CAPM

06/18 - 03/20	**INDIAN INSTITUTE OF MANAGEMENT AHMEDABAD**	Ahmedabad, India

M.B.A.
- *Coursework:* stochastic calculus, data analysis, algorithmic trading, option pricing, blockchain

07/12 - 05/16	**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**	Mumbai, India

B.Tech in Mechanical Engineering and Minor in Electrical Engineering
- *Coursework:* calculus, linear algebra, computer programming

EXPERIENCE

07/20 - 05/22	**FINIQ CONSULTING INDIA PVT. LTD.**	Pune, India

AVP - Derivatives Platform Consultant (Excel VBA, C#, SQL)
- Designed and implemented accumulator, decumulator pricer with back-solve functionality and Greeks calculations
- Developed Monte Carlo (MC) pricing scripts for equity structured investment products; implemented pricer functionality on platform to showcase indicative prices on screen
- Led team to create optimum underlying basket size calculator using Excel VBA; formulated recommendation to investors for higher yields
- Implemented payoff scripts that OCBC Bank and RHB Bank currently use for pricing; developed system interfaces using C# and SQL, which remain live at RHB
- Managed 15 people to develop and deliver customized products for client, JAR Capital

08/16 - 06/18	**VIRTUSA CONSULTING SERVICES PVT. LTD.**	Hyderabad, India

Engineer – Technology (Java, J2EE technologies, and GWT)
- Rolled out 20 deliverables to production successfully in $2.5M transformation project
- Received highest rating (10/10) as well as direct appreciation from client in assigned project
- Attained 25% reduction in weekly bug reporting rate by devising and formulating regression suite
- Recognized as subject matter expert in development and implementation using Java and GWT
- Resolved 100+ critical client issues in production and reduced count by 70% in less than 1 year

PROJECTS

09/23 - 12/23	**BLU ANALYTICS**	New York, NY

Pricing American Options with Reinforcement Learning (Python)
- Replicated American option using time-dependent barrier options, with MC and analytical formulas
- Implemented temporal difference backpropagation (TDBP) learning to train and optimize a deep neural network for sequential decision-making tasks to be applied to option pricing
- Attained 99% accuracy by optimizing exponential barrier approximation to fit Snell envelope

01/23 - 05/23	**NYU COURANT**	New York, NY

Latent Semantic Analysis (LSA) with Machine Learning (Python)
- Created LSA-based recommender by vectorizing Twitter financial news; used SVD to derive term frequency and importance; attained 90% accuracy with KNN classifier

Regression Trees and Feature Map Regression (Python)
- Performed Gaussian kernel feature map regression, random forest and gradient boosting on subsampled image; filled in missing data (20%) with SL; achieved lowest MSE with random forest

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Java, Python, C++, SQl, VBA, MATLAB, R
Languages: English (fluent), Hindi (fluent), Telugu (native), German (basic)
Certification: Programming for Everybody (Python), Neural Networks and Deep Learning from Coursera

RUNTIAN (LARRY) LIANG

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EDUCATION

Expected 05/24	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Recent Coursework:* Black-Scholes formula and partial differential equation, Monte Carlo simulation, deep learning, stochastic calculus, portfolio optimization, risk management
- *Forthcoming Coursework:* dynamic asset pricing, advanced statistical inference and machine learning, time series and statistical arbitrage, algorithmic trading, crypto and blockchains

09/19-05/23	**NEW YORK UNIVERSITY**	New York, NY

College of Arts and Science
B.A. in Mathematics and Data Science
- *Coursework:* deep learning, linear algebra, probability and statistics, OOP in Java and Python, regression, random forest, numerical analysis, database management and analysis

EXPERIENCE

05/23 - 08/23	**CITIC SECURITIES**	Shanghai, China

Quantitative Research Intern (Python, MySQL)
- Built backtest system using Backtrader, with modules including data collection, data preprocessing, trading signal detection, data visualization, and performance analysis
- Created multi-factor model that analyzed performance of fundamental and technical factors of CSI 1000 stocks' performance; achieved Sharpe ratio of 2.13
- Constructed and managed database from over 800k research reports and data from more than 5k A-Share stocks

02/21 - 05/21	**HAITONG INNOVATION CAPITAL MANAGEMENT**

(Private equity firm with $3B AUM)
Private Equity Analyst Intern   Shanghai, China
- Collaborated on writing industry/company analysis, and provided investment suggestions
- Interviewed experts to develop industry insight, which facilitated investment decision process
- Researched supply chain for several fields (e.g., chips, renewable energy, SaaS systems), and produced reports about competitive patterns within them

PROJECTS

NEW YORK UNIVERSITY

01/23 - 05/23	**Pricing an Exotic Option using Hull-White Model (Python)**	New York, NY

- Derived dynamics of Nikkei index, forward rate, and risk free rate using past data and calibrated Nelson-Siegel and Hull-White models
- Retrieved past data of variables (e.g., Nikkei-225 index, US 10Y Treasury) using NASDAQ API
- Built automated program that visualized data predictions (e.g., Nikkei index) and generated option price when inputs were provided (e.g., relative strike prices, maturity dates)

04/22 - 07/22	**Bitcoin Price Predictions Based on Blockchain Information (Python)**	New York, NY

- Conducted research by reading 20+ papers and replicating algorithms; made presentations about insights and results and engaged in peer review process
- Predicted bitcoin prices by cleaning multiple 13 years' bitcoin related data; employed Bayesian neural network with 10 independent variables of block chain information

01/22 - 05/22	**Movie Rating Prediction Project (Python, PyTorch)**	New York, NY

- Fitted different ML models (e.g., linear regression, clustering) to predict movie ratings with dataset including 400k users and 5k movies; attained RMSE of 1.274 with lasso regression

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python (Numpy, Scipy, Pandas, Pytorch), SQL, Java
Languages: Mandarin (native); English (fluent)

ERDING LIAO

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* database management (SQL), big data (Apache Hadoop), hierarchical regression, EM algorithm, Markov Chain Monte Carlo, Gibbs Sampling, Ito calculus and Black-Scholes model, portfolio management

09/18 - 06/22	**UNIVERSITY OF CALIFORNIA, SAN DIEGO**	San Diego, CA

B.S. in Mathematics (Applied)
- *Coursework:* SVM and kernel methods, classification tree and random forest, principal component analysis, Markov chain, recommendation system, data visualization, partial differential equations
- *Honors/Awards:* Cum Laude (top 8%)

EXPERIENCE

06/23 - 08/23	**AC SUNSHINE SECURITIES LLC**	Orlando, FL

Operation Assistant Intern
- Provided vital support for company president; managed complex scheduling, liaising with high-profile clients, and streamlining daily administrative tasks
- Collaborated with team on IPO engagements, gathered and organized essential datasets of related companies' financial records, and performed IPO valuations with financial analysts
- Supported rigorous market analysis of artificial intelligence and semiconductor sectors, compiled research findings, and provided informative insights

09/20 - 06/21	**UNIVERSITY OF CALIFORNIA, SAN DIEGO**	San Diego, CA

Math Honors Researcher: Hidden Markov with Partially Missing Observations (Python, R)
- Evaluated practicality of Hidden Markov model in financial market prediction with respect to HMM-GMM algorithm and Monte-Carlo GMM
- Developed alternative EM-algorithm for Hidden Markov model with discontinued observations; contributed to analysis on its potential implementation for HMM-GMM model

08/19 - 10/19	**DONGXING SECURITIES Ltd**	Chongqing, China

Data Analyst Summer Intern (Python, SQL)
- Collected historical stock data of clean energy companies in China, and participated in data cleaning and standardization
- Collected and prepared textual data from 1 year's news articles in clean energy sector for subsequent analysis by other team members
- Used feature extraction based on selected 1-year's news and historical stock data to improve and rebalance current portfolio; ROI increased by 7 basis points

PROJECTS

	UNIVERSITY OF CALIFORNIA, SAN DIEGO	
02/21 - 05/21	**Deep-Learning AI - Poetry Generator (Python)**	San Diego, CA

- Implemented language model for RNN based on datasets of Shakespeare poetry; analyzed performance with respect to time/space complexity
- Improved performance of language model through N-gram with RNN; reduced complexity through pruning5

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, JavaScript, SQL, Rstudio
Other Skills: Power BI, Tableau
Languages: Mandarin (native); English (fluent)
Activities: Vector calculus teaching assistant and grader at UCSD
License: Securities Industry Essentials (SIE)

SIHAN LIU

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY
	The Courant Institute of Mathematical Sciences	
	M.S. in Mathematics in Finance	

- *Coursework:* linear regression, option pricing, optimal execution (Almgren-Chriss)
- *Expected Coursework:* Bayesian statistics, time series analysis

09/18 - 06/22	**NEW YORK UNIVERSITY SHANGHAI**	Shanghai, China
	B.S., Double Major in Honors Mathematics (Pure Mathematics) and Data Science	

- *Coursework:* parameter estimation, machine learning, OOP, data structures, algorithms
- *Honors/Awards:* Dean's list for 4 years, Latin Honors Cum Laude (GPA top 30%)

EXPERIENCE

07/23 - 09/23	**SHANGHAI QINGAN INVESTMENT MANAGEMENT CO., LTD.**	Shanghai, China
	Quantitative Research Intern (Python)	

- Replicated quantitative research paper by applying Fama-French 3-factor model to Chinese stock market data, computed 2 related factors, and evaluated their performance (IC, IR, Sharpe ratio)
- Reverse-engineered composition of 1 earnings forecast index through trial and error, closely matching shape of original index's cumulative return curve over 5-year period
- Attempted to enhance strategy underlying earnings forecast index using decision tree models; learned to augment and impute dataset
- Developed Python script to automate extraction of key financial metrics (unit NAV, returns, total net assets) for fund products from email Excel attachments

12/21 - 01/22	**GUOTAI JUNAN SECURITIES CO., LTD.**	Shanghai, China
	Quantitative Research Intern (Python)	

- Evaluated Chinese stock market's key indicators (e.g., major indices, cross-sectional volatility, sector performance); wrote monthly market overview report
- Backtested to improve double-moving-average strategy on CSI 500 ETF; achieved 7.87% annualized return, 0.66 Sharpe ratio, and 23% max drawdown

06/21 - 08/21	**ATOS INFORMATION TECHNOLOGY**	Chengdu, China
	Data Analyst Intern (Excel, VBA)	

- Generated daily reports to display operational data clearly and concisely
- Automated process of generating reports and sending emails using VBA and Power Query; result: reductions to 25% of production time and 17% of disk memory used by data

PROJECTS

03/23 - 04/23	**Algorithmic Trading Framework (Covariance Estimation, Portfolio Optimization, Python)**

- Conformed 3-month S&P 500 stocks' binary quotes and trades of second-level tick data
- Bucketed second-level trade data with optimal minute span that generated non-autocorrelated return series (calculated with first and last trade prices) without bid-ask bounce effect
- Estimated covariance matrix for use in mean variance portfolio optimization with 3 approaches: empirical covariance, "clipped," and "optimalShrinkage" estimators

05/23 - 05/23	**Local Volatility Surface Interpolation (Equity Derivatives)**

- Used SVI parameterization to create continuous surface of implied volatility, and calculated local volatility surface using Dupire formula
- Displayed calibrated local volatility surface as 3D graph in Python

COMPUTATIONAL SKILLS

Programming Languages: Python, Java, SQL, VBA
Other: Python Flask, HTML, LaTex

ZIYU (ZOE) LIU

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Expected Coursework:* object-oriented programming (Java), penalized regression, decision trees, linear regression, Fama-French, Black-Scholes, stochastic processes

10/20 – 07/21	**UNIVERSITY OF CAMBRIDGE**	Cambridge, UK

M.A.S. in Pure Mathematics
- *Coursework:* algebraic number theory, commutative algebra, Weyl algebra, profinite groups and group cohomology, elliptic curves

09/16 - 05/20	**MOUNT HOLYOKE COLLEGE**	South Hadley, MA

B.A. in Mathematics
- *Coursework:* abstract algebra, real and complex analysis, differential geometry, partial differential equations, combinatorics

EXPERIENCE

01/22 - 06/22	**FOSUN CAPITAL** ($7.3B AUM)	Shanghai, China

Investor Relations Intern, Fosun Capital Flagship USD Fund
- Drafted roadshow materials for growth stage USD fund targeting LPs in Asia, Europe, and Australia; participated in roadshows and communicated proactively on fundraising progress
- Conducted research on secondary funds and completed report covering transaction structure, domestic and foreign market overview, and fundraising in Asia Pacific region
- Collaborated with TMT, healthcare, and consumer project teams in connecting with potential investors; participated in roadshows; gained insight into multiple sectors
- Prepared summary report on fund due diligence questions; crafted monthly reports to update LPs with latest developments in fund management

07/20 - 09/20	**TOPSPERITY FUND** ($4.7B AUM)	Shanghai, China

Research Analyst, Security Analysis / Consumer and TMT
- Collected TMT and consumer industry trends through 20 expert calls and industry conference calls; consolidated meeting memos and presented findings to fund managers
- Selected stocks based on financial analysis, fundamentals, sector trends and shareholding structure in TMT and consumer industries based on financial reports and WIND
- Analyzed companies and stocks in TMT and consumer industries (e.g., RELX, Smoore Intl.) through industry analysis and competitive strengths analysis as well as valuation
- Automated daily morning reports process with Python and Excel

PROJECTS

05/18 - 07/18	**MUHLENBURG COLLEGE REU – REU Math Research**	Allentown, PA

Investigation on Partitions with Equal Products
- Initiated new approach to applying combinatorics and number theory; published paper on integer partitions in International Journal of Number Theory

Sums of Polygonal Numbers
- Conducted research and collaborated on report with team members

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Java; Python
Languages: English (fluent), Mandarin (native); German (basic); Homeric Greek (basic)
Activities: President of Association for Women in Mathematics at Mount Holyoke College chapter

YOURAN PAN

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* object-oriented programming, Black-Scholes, derivative securities, quantitative portfolio theory, finite difference method, interest rate and FX models, dynamic asset pricing
- *Expected Coursework:* time series analysis, advanced statistical inference, alternative financial data

08/18 - 05/22	**DUKE UNIVERSITY	DUKE KUNSHAN UNIVERSITY**	Durham, NC	Kunshan, China

B.S. in Applied Mathematics
- *Coursework:* linear algebra, ODEs, PDEs, stochastic process, numerical analysis, mathematics of machine learning, econometrics
- *Awards:* Mathematical Modeling Context (honorable mention) 2021, Mathorcup Mathematical Modeling Challenge 2020 (group won 1st place)

EXPERIENCE

08/23 – present	**CARBON BASELINE**	Shanghai, China (remote)

Consulting and Research Analyst Intern (Python)
- Conducted carbon credits insurance and ecological value mitigation pricing
- Analyzed risks associated with green financial products

05/23 – present	**PEKING UNIVERSITY**	Beijing, China (remote)

Quantitative Trading Strategy Research Assistant (Python)
- Developed and researched cryptocurrency trading algorithms encompassing pairs trading and futures-spot arbitrage (has been put into use)
- Researched optimal execution and slippage problem; created execution strategy based on VWAP
- Developed, analyzed and compared portfolio allocation strategies based on Kelly Criterion, risk parity, mean-variance optimization, Black-Litterman, and maximum diversification
- Analyzed impact of funding rates on cryptocurrency spot price risk metrics (VaR and ES); designed and conducted stress tests using jump diffusion model on statistically generated data

01/23 – 02/23	**IAQF ANNUAL ACADEMIC COMPETITION**	New York, NY (remote)

Team Leader (Python)
- Developed pairs trading strategy with 3 methods: cointegration; copula (i.e., assumptions and how frequently to update parameters); and ML (polynomial L2 regularization loss function)
- Generated trading signals for entry and exit based on price spreads
- Managed risk based on half-life holding and volatility prediction; backtested copula and ML methods, and attained Sharpe ratios of 2.46 and 1.00, respectively

PROJECTS

	NEW YORK UNIVERSITY	New York, NY
02/23 - 02/23	**LSA-Based Recommender Using Huggingface X Financial News Sentiment Dataset (Python)**	

- Created LSA recommender pipeline taking any corpus, vectorized it using TFIDF, and projected it onto reduced dimensional vector space; result: top 5 tweets closest to target corpus
- Used L2 distance as proximity metric in latent semantic reduced dimensional space

02/23 - 02/23	**Using Deep Learning to Solve Forward-Backward Stochastic Differential Equations (Python)**

- Priced European option using Black-Scholes model under risk neutral measure
- Converted Black-Scholes result to backward SDE using backward Kolmogorov's equation
- Developed deep BSDE neural network based on simple feedforward neural network units
- Compared pricing result of deep BSDE with Monte-Carlo's

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, MATLAB, SQL, Stata, R
Languages: English (fluent); Mandarin (native); Japanese (fluent)

TINGHAN (TIRRY) WANG

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EDUCATION

Expected 12/23 **NEW YORK UNIVERSITY** New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* statistical learning theory, latent semantic analysis, Fama-French, Hull-White, stochastic/local volatility model, Greeks, convex optimization, FX model, market impact
- *Expected Coursework:* trends in financial data science, statistical arbitrage

09/18 - 07/22 **SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY** Shenzhen, China
B.S. in Mathematics and Applied Mathematics
- *Coursework:* differential equations, real and complex analysis, statistics, Markov chain, stochastic process, Black-Scholes, time series analysis, econometrics, C/C++, data structures
- *Award:* First Prize Scholarship (top 5% in college)

EXPERIENCE

07/23 - 09/23 **BOSERA ASSET MANAGEMENT** Beijing, China
(8th largest mutual fund in China)
Quantitative Asset Allocation Intern (Python)
- Constructed predictive factors of funds based on fund managers' capabilities, fund tick data, and correlations among funds, followed by ICIR-based selection
- Applied random forest and multilayer perceptron models to predict fund returns, and applied adjusted Markowitz approach for portfolio construction
- Implemented TIPP drawdown control framework, achieving annualized excess return of 5% and maximum drawdown of 3% over 5-year backtest

05/23 – 07/23 **SHENWAN HONGYUAN CO., LTD** Shanghai, China
Quantitative Research Intern (Python)
- Generated industry factors based on basic ones (e.g., value, momentum, quality); applied Kalman filter and verified effectiveness of updated factors
- Used XGBoost model to predict industry index returns, aiding in industry index selection
- Incorporated Grossman (1993) framework and its VaR-based optimized model; achieved annual excess return: 15%, Sharpe ratio: 1.8, and max drawdown: 11% over 10-year backtest

PROJECTS

03/23 - 04/23 **NYU COURANT** New York, NY
Analysis of High-frequency TAQ Data (Python)
- Preprocessed tick-level transaction data for all S&P 500 stocks, adjusted for corporate actions, and removed outliers based on Bollinger Band
- Built impact model based on Almgren's paper (2005), employing NLS for parameter estimation and bootstrapping for robust standard error generation

11/22 - 12/22 **Exotic Option Pricing (Python)**
- Priced exotic option comprising Nikkei-225 quanto option and LIBOR caplet by applying Girsanov Theorem to identify EMM-numeraire pair and Monte Carlo simulation
- Modeled LIBOR caplet dynamics using Hull-White and LIBOR market models

07/21 - 08/21 **NORTH CAROLINA STATE UNIVERSITY** Raleigh, NC
Computational and Financial Mathematics and Simulations (Java)
- Priced American options using LSMC and finite difference methods
- Increased price estimation accuracy by applying weighted least squares; employed forward Monte Carlo simulation to improve computational speed

COMPUTATIONAL SKILLS / OTHER

Programming: Python, SQL, R, Java
Languages: English (fluent), Mandarin (native)
Interests: Badminton (Captain of varsity team; Guangdong Badminton Championships, 2nd place in men's singles)

YIFAN (MICHAEL) WANG

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Expected Coursework:* Black-Scholes & Greeks, stochastic processes, object-oriented programming (Java), penalized regression and time series, decision trees, machine learning

09/20 - 05/22	**COLUMBIA UNIVERSITY**	New York, NY

B.S. in Applied Mathematics
- *Coursework:* linear regression, partial differential equations, statistical inference, Fourier analysis, modern algebra, numerical analysis, CAPM model, advanced linear algebra, options

09/17 - 05/22	**DICKINSON COLLEGE**	Carlisle, PA

B.A. in Mathematics
- *Honors***:** Major Honor Society, Dean's List, Pi Mu Epsilon Honor Society

EXPERIENCE

06/22 - 07/22	**DEUTSCHE BANK**	Shanghai, China

Capstone Project, Quantitative Research
- Conducted portfolio optimization on index ETFs and gold using mean-variance, Black-Litterman, and risk parity in Python; simulated asset weights to calculate efficient frontier
- Extracted pricing from data APIs using Python; performed data cleaning and transformation
- Backtested portfolio performance based on risk parity method that auto-adjusted its weights monthly; built functions to calculate annualized return, volatility, Sharpe ratio, max drawdown

05/21 - 08/21	**DELOITTE CONSULTING CHINA**	Shanghai, China

Finance & Performance Consulting Intern
- Developed talent scoring framework based on machine learning models such as linear regression, random forest, and gradient boosting decision tree in Python
- Performed data collection, cleaning, and transformation of past employee evaluation data; conducted feature engineering based on dimensions such as leadership and technical skills
- Created interactive data visualization dashboard in Tableau to perform comparative analyses

PROJECTS

03/22 - 05/22	**COLUMBIA UNIVERSITY**	New York, NY

Machine Learning Driven Sector Return Prediction (Python)
- Built machine learning models such as linear regression, ridge regression, and random forest to predict returns of sector ETFs such as US Technology and Financials iShares
- Constructed features based on macro factors (e.g., CPI) and sector average fundamental ratios

09/21 - 12/21 **Stock Valuation Based on DCF and Black-Scholes Model (Python)**
- Built web crawler to collect price and financial statement data from Yahoo Finance
- Applied DCF model with growth-rate assumptions in high- and stable-growth periods; performed Monte Carlo simulations of company's value and stock prices through 10K+ paths
- Calculated intrinsic stock value using weighted average result from DCF, MCS, and B-S models

02/21 - 05/21 **Future Arbitrage Using Ornstein-Uhlenbeck Model (MATLAB)**
- Crafted Ornstein-Uhlenbeck mean version model to predict spot-to-future price ratio for gold
- Back-tested arbitrage trading strategy using ratio to test model's efficacy

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python (NumPy, Pandas, Sklearn, SciPy), SQL, Java, R, MATLAB
Languages: English (fluent); Mandarin (native)

ZHANGYI (OLIVER) WANG

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY** **The Courant Institute of Mathematical Sciences** **M.S. in Mathematics in Finance**	New York, NY

- *Coursework:* object-oriented programming (Java), financial modeling, risk management, algorithmic trading, stochastic processes, Fama-French, Black-Scholes

08/18 - 05/22	**NEW YORK UNIVERSITY SHANGHAI** **B.S. in Data Science**, **B.A. in Economics**	Shanghai, China

- *Coursework:* deep learning, regression, causal inference, optimization, databases, linear algebra, multivariable calculus, probability and statistics
- *Honors/Awards:* Dean's List for Academic Year 2020, 2021; NYU Shanghai Excellence Award; Magna Cum Laude

EXPERIENCE

05/23 - 08/23	**HERMES CAPITAL ADVISORS** **Quantitative Research Intern (Python, Linux)**	New York, NY

- Constructed pipelines for capturing and preprocessing real-time millisecond order book depth, book diff, and aggregate trade data for crypto instruments using websocket and exchange APIs
- Examined ensemble methods based on deep reinforcement learning agents such as A2C, PPO, and RainbowDQN for medium-frequency crypto trading
- Updated environment for reinforcement learning with larger action spaces and trade matching mechanism for sending limited orders, reducing transaction costs by 0.2%

06/22 - 08/22	**TURING FUND MANAGEMENT** **Quantitative Research Intern (Python)**	Shanghai, China

- Replicated and examined different versions of AlphaNet (factor mining network) with Keras
- Conducted single-factor IC testing and multi-layer testing using the latest daily trading data
- Adjusted inner operators and layers of AlphaNet and improved rank IC by 1%

07/21 - 08/21	**INSTITUTE OF INTELLIGENT COMPUTING TECHNOLOGY, CAS** **Financial Data Mining and Analysis Intern (Python, Stata)**	Suzhou, China

- Collected sector index data and examined potential sector linkage and rotation patterns using Apriori algorithm for over 120 industries from 2014 to 2021
- Labeled data, extracted, and categorized information contained in financial news and reports for sentiment analysis; contributed to the development of industry mapping knowledge domain

PROJECTS

02/22 - 05/22	**NEW YORK UNIVERSITY SHANGHAI** **Momentum Strategy with Deep Reinforcement Learning in Chinese Stock Market (Python)**	Shanghai, China

- Implemented risk-adjusted momentum strategies using DDPG model, based on first open-source DRL framework, FinRL
- Conducted backtesting for automatic trading with SSE 50 constituent stock portfolio

10/21 - 12/21	**NEW YORK UNIVERSITY SHANGHAI** **Online Air Ticket Reservation System (Python, MySQL, HTML)**	Shanghai, China

- Constructed online air ticket reservation system enabling customers, booking agents, and staff to finish various tasks including viewing public info and buying tickets using Python and MySQL
- Designed web-based application for system, using Flask framework and HTML

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, Linux, MySQL, Stata, Javascript
Languages: English (fluent); Mandarin (native)

DAJUN XU

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EDUCATION

NEW YORK UNIVERSITY New York, NY
Expected 12/23

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* stochastic calculus, Black-Scholes equation, short rate model, factor models, portfolio optimization, linear regression, Monte Carlo method, object-oriented programming
- *Expected Coursework:* time series analysis, statistical arbitrage, fixed income derivatives

09/17 - 03/22 **UNIVERSITY OF CALIFORNIA, IRVINE** Irvine, CA
B.S. in Mathematics (Honors Program), B.S. in Neurobiology
- *Coursework:* real analysis, stochastic process, partial differential equations

EXPERIENCE

REVERE SECURITIES LLC New York, NY
11/22 - Present **Investment Banking Analyst Intern**
- Collaborated on 8+ deals, including M&A and equity financing for public and private companies
- Constructed financial models and presentation decks covering discounted cash flow valuation, scenario and sensitivity analysis, and precedent transaction analysis
- Participated in several lead-left IPO's; attended due diligence calls and reviewed draft filings
- Selected Nasdaq Transaction Experience:

ETAO	$1bn	de-SPAC advisor for Chinese digital healthcare provider
MGIH	$5mm	lead-left bookrunner for Hong Kong packaging manufacturer
GDHG	$7mm	lead-left bookrunner for Chinese amusement park operator
PWM	$5mm	lead-left bookrunner for Hong Kong asset manager
FTEL	$15mm	lead-left bookrunner for Australian fitness equipment retailor

PROJECTS

NYU COURANT New York, NY
09/22 - 12/22 **Quanto Option Pricing (Python)**
- Created pricing routine for contract based on Nikkei-225 and USD LIBOR rate
- Derived dynamics of Nikkei index with geometric Brownian motion and maximum likelihood
- Forecasted LIBOR rate with Cox–Ingersoll–Ross model and visualized predictions

UNIVERSITY OF CALIFORNIA, IRVINE Irvine, CA
06/20 - 08/20 **REU Student Researcher – Biochemistry**
- Calculated and mapped electrostatic impacts of remdesivir nucleotide analogue on SARS-CoV-2 RNA-dependent polymerase with Poisson-Boltzmann equation
- Visualized and rendered calculated data and identified potentially interesting protein regions for further molecular dynamics simulation
- Contributed to published research: Probing remdesivir nucleotide analogue insertion to SARS-CoV-2 RNA dependent RNA polymerase in viral replication

03/20 - 06/20 **Epidemic Modeling (MATLAB)**
- Implemented delayed SIR model with MATLAB to fit and predict number of COVID-19 cases
- Added delayed differential equation and equation solver to Bayesian interference and Markov chain Monte Carlo model to account for oscillation in daily COVID-19 case trend

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, Java, MATLAB, Mathematica, R
Languages: English (fluent), Mandarin (native)

JIAQI (GEORGE) YE

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* object-oriented programming (Java), risk and portfolio management, interest rate and FX models, modeling and risk management of securitized products, Monte Carlo simulation

08/19 - 05/22	**NEW YORK UNIVERSITY**	New York, NY

B.A. in Mathematics
- *Coursework:* multivariable calculus, linear algebra, probability, statistics, numerical analysis, real analysis, data structures, algorithms, financial accounting, economics
- *Minor:* Computer Science
- *Honors/Awards:* Degree with Distinction; Dean's List for 5 semesters

EXPERIENCE

06/23 - 08/23	**CDH Investments**	
	(Alternative asset management firm with $27B AUM)	Shanghai, China

Private Equity Intern (Excel, PowerPoint)
- Conducted research in MedTech and Fintech industries in Greater China, Europe and US; synthesized research reports and prepared for due diligence questionnaire meetings
- Organized expert meetings to answer technical questions for team; analyzed growth roadmap and potential opportunities for underlying companies
- Compared valuation methodology of peer companies; made return profiles based on MOIC and IRR for underlying companies to support final investment decisions

06/21 - 08/21	**SHENWAN HONGYUAN CO., LTD**	
	(Top 10 securities firm in China)	Beijing, China

Quantitative Research Intern (Python, Excel, PowerPoint)
- Priced convertible bonds with Black-Scholes model and Monte Carlo simulation in Python; built convertible bond index in Excel
- Audited 3 asset securitization investment projects; analyzed and integrated information and data according to clients' promotional material; crafted reports and presented to manager
- Predicted cash flow for asset securitization investment projects using Excel; created tables to visualize data and ensured their accuracy
- Updated and supplemented research reports of clients China Railway, China Communications Construction, China Railway Construction, and China Power Construction

PROJECT

11/20 - 12/20	**NEW YORK UNIVERSITY SHANGHAI**	Shanghai, China

Welfare and Inequality in China (Python, Excel)
- Collected data and analyzed relationship among level of education, medical treatment, and inequality in different provinces in China
- Applied linear regression to calculate relationships among different provinces' data; used hypothesis testing to determine which data was relevant
- Summarized data in Excel and applied GeoDa to make visualization about inequality; wrote reports and presented findings

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Java, Python, C, MATLAB, R
Skills: Excel, PowerPoint
Languages: English (fluent), Mandarin (native)
Affiliation/Certification: CFA Level I candidate
Interests: Bodybuilding, Basketball
Other Experience: English Language Teaching Assistant, Martz Educational Institute in Soochow, China

BAIHE YUAN

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY
	The Courant Institute of Mathematical Sciences	
	M.S. in Mathematics in Finance	

- ***Coursework:*** interest rate models, Black-Scholes theory, PCA, Fama-French models

07/18 - 05/22	**BRANDEIS UNIVERSITY**	Waltham, MA
	B.S. in Economics & Mathematics Double Major; Business Minor	

- ***Honor:*** Magna Cum Laude

EXPERIENCE

06/23 - 08/23	**CINDA SECURITIES (Python)**	Beijing, China
	Quantitative Financial Engineer Intern	

- Explored rationales behind Alpha101 strategies to achieve superior market returns
- Identified and implemented 8 additional evaluation criteria to select high-yielding alphas
- Programmed and seamlessly integrated alphas into platform for rigorous testing

05/21 - 07/21	**TAIKANG PENSION & INSURANCE (Tableau)**	Beijing, China
	Strategic Planning Analyst Intern	

- Analyzed and visualized 1,600+ employees' health data in 17 industries (Excel, Tableau)
- Provided market insights from health data (e.g., industries with highest percentage of smokers and their need for lung health monitoring) to fuel new business venture at Taikang

07/19 - 09/19	**TOTO NORTH CHINA (Excel)**	Beijing, China
	Data Analyst Intern	

- Learned and applied Excel functions to collect and verify new product information; gave suggestions to factory for production planning based on new products' sales volume
- Enhanced office efficiency by optimized inventory management based on usage frequency

PROJECTS

11/22 - 12/22	**NYU COURANT**	New York, NY
	Predicting Option Prices for US Investors on Nikkei 225 with MC Stimulation (Python)	

- Applied Ho-Lee model for forward rate dynamics, then applied MC for Libor calculation
- Derived dynamic equations for Nikkei 225 and ¥/$ FX rate to forecast S&P 500 and calculate option price using integrated payoff equation

09/21- 12/21	**BRANDEIS UNIVERSITY**	Waltham, MA
	Movie Recommendation Algorithm (Python)	

- Collaborated with team members to build algorithm that made movie recommendations based on users' browsing histories; achieved 5.09 (MSE) of accuracy
- Based on 4,500 observations, applied PCA, k-clustering, and stochastic gradient descent to complete the rating matrix; then used least square regression to find coefficients of model

09/19 - 11/19	**Investment Club - Analysis of US Treasury and Energy Sectors in China**

- Analyzed macroeconomic data and Federal Reserve policy, projected that 10-year US Treasury bond yields would be at least 2.7% at end of 2023
- Collected information and analyzed external factors, predicting crude oil return decrease as well as natural gas and renewable energy increase after 2025

09/21 - 11/21	**RENMIN UNIVERSITY**	Beijing, China
	Forecasting Shanghai and Shenzhen Composite Indices (R Studio)	

- Developed and tested ARMA models for forecasting Shanghai and Shenzhen stock returns
- Created GARCH models to compare two markets, revealing closely correlated volatility through coefficient analysis and conditional standard deviation

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, R Studio, Tableau, MySQL, Java
Languages: English (fluent), Mandarin (native)
Certification: Passed CFA Level I

YUXUAN (LEXIE) ZHANG

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY** **The Courant Institute of Mathematical Sciences** **M.S. in Mathematics in Finance**	New York, NY

- *Coursework:* LSTM model, Black-Scholes formula, options pricing, risk-neutral valuation

09/18 - 06/22	**BEIJING JIAOTONG UNIVERSITY** **B.S. in Statistics**	Beijing, China

- *Coursework:* probability, stochastic process, machine learning, real analysis, time series analysis
- *Honors:* National Recognition (team ranked top #65 of 844) in Bayesian Statistics, First Prize in Chinese Undergraduate Mathematical Contest in Modeling (team ranked in top 4% nationwide)

EXPERIENCE

07/23 - Present	**GOQUANT** **Quantitative Analyst Intern (Python, R)**	Miami, FL

- Developed digital asset visualization platform, with real-time data across 9 exchanges and 200+ symbols; implemented functions including live order book, candlestick plot, and latency metrics
- Launched platform on live URL with uptime assurance, enhancing user experience and retention

07/23 - Present	**INDUSTRIAL SECURITIES** **Quantitative Research Intern (Python)**	Remote

- Constructed one-step survival technique with MC simulation to compute Greeks of multi-asset worst-of-all autocallables; further adapted for derivatives with knock-in mechanisms
- Utilized backward method, outperformed forward approach with 43.7% reduction in runtime

07/21 - 09/21	**CHINA GALAXY SECURITIES** **Investment Banking Analyst Intern (Wind, Excel)**	Beijing, China

- Visualized data with PivotChart; cleaned 235 fixed income securities' data with VLOOKUP
- Used evaluation model, referring to prior 3 years' mergers, using precedent transaction analysis

12/20 - 02/21	**ACCENTURE** **Technology Consulting Assistant (SAP)**	Beijing, China

- Created budget table in SAP with team; created 23 logical carding diagrams of cost allocation
- Communicated with client to enhance intersectoral collaboration and system implementation

07/20 - 08/20	**PANGUWEB TECHNOLOGY** **Data Analyst Intern (Power BI, Power Query)**	Shijiazhuang, China

- Processed data with Power Query to assess prior 10 years' sales volumes of 100+ product lines
- Applied Pareto's rule to seasonal data, optimizing strategy for a 15% revenue increase

PROJECTS

11/22 - 12/22	**NYU COURANT** **Equity-Interest Rate Option Pricing (Python)**	New York, NY

- Built Quanto and Vasicek Short Rate Model for foreign stock index and LIBOR hybrid option
- Ran 2-factor Monte Carlo and discounted with domestic riskless numeraire to get payoff

06/20 - 04/21	**BEIJING JIAOTONG UNIVERSITY** **Empirical Bayesian Estimation in Generalized Censoring Scheme (R, MATLAB)**	Beijing, China

- Optimized parameters with Bayesian methods; applied Metropolis-Hastings for simulation
- Published 2 papers in SCI journals: Entropy and Mathematical Problems in Engineering

05/20 - 07/20	**HARVARD BUSINESS SCHOOL** **Fintech and Asset Management (Python)**	Remote

- Used DCF and DuPont analysis for Yangjie Technology Co., Ltd. stock
- Predicted stock price trends with ARIMA, GARCH, Holt-Winter; used SVM for nonlinear part; made buy recommendation; achieved 148% return over 1.5 years compared to 6% for CSI 300

COMPUTATIONAL SKILLS / OTHER

Programming: Python, Java, R, MATLAB, SQL, Wind   *Languages:* English (fluent); Mandarin (native)

CHEN ZHAO

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EDUCATION

Expected 12/23	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Coursework:* stochastic calculus, data science and data-driven modeling, portfolio optimization, derivative pricing, Monte Carlo simulation, reinforcement learning, cryptocurrency

09/18 - 04/22   **UNIVERSITY OF PITTSBURGH**   Pittsburgh, PA
B.S. in Material Science and Engineering, Minor in Economics
- *Coursework:* stochastic process, probability theory, linear algebra, machine learning, differential equation, corporate finance, game theory, numerical analysis

EXPERIENCE

06/23 - 08/23   **KANARIES DATA**   Hangzhou, China
Data Science Intern (Python)
- Enhanced data-driven equation discovery process by integrating reinforcement Q-learning techniques; facilitated identification of novel causal inferences
- Leveraged Kullback-Leibler and Jensen-Shannon divergences to sharpen distribution insights; used maximum mean discrepancy for 2-sample testing and generative neural network training
- Applied Gaussian processes for intricate inter-variable relationship detection; enhanced hyperparameter tuning by Bayesian optimization with Gaussian processes as surrogate functions

02/23 - 05/23   **QUANT CHINA**
Quant Research Intern (Python)   Shenzhen, China
- Utilized VPIN models to extract order flow toxicity from high-frequency tick data, leading to a precise enhancement of low-frequency factors in trading strategies and resulting in 10% improvement in Sharpe ratio
- Analyzed factor crowding model from MSCI metrics and assessed VPIN factor's crowding score, enhancing accuracy and reliability of trading strategies
- Designed an advanced indexing strategy for CSI 500, employing mean-variance optimization to control transaction costs alongside Barra CNE5 model, resulting in 6% increase in Sharpe ratio
- Implemented DDPG for dynamic portfolio optimization, leveraging CNN architectures in actor and critic networks, successfully reducing transaction costs by 50%
- Infused Ornstein-Uhlenbeck noise into DDPG actor network for refined exploration; maximized total reward and ensured precise trading signal generation

PROJECTS

02/23 - 05/23   **NYU COURANT**   New York, NY
Portfolio Optimization (Python)
- Enhanced portfolio returns and risk-adjusted performance using mean-variance model and further refined it with Black-Litterman adjustments
- Crafted comprehensive framework combining predictive models with mean-variance optimization, applying neural networks for inequality-constrained cases
- Utilized Bellman equation to define objective function for dynamic portfolio optimization and employed reinforcement learning to identify optimal policy

05/23 - present   **Capstone Project: Crypto Market Trading (Python)**
- Examined overreaction in crypto market using quantile autoregression; found overreaction in daily and weekly frequencies, specifically bearish in daily and bullish in weekly
- Leveraged machine learning to integrate factors and generate novel trading signals for individual assets, and performed asset allocations using diverse machine learning models
- Designed portfolio to replicate Bitcoin's performance and utilized time series analysis to uncover arbitrage opportunities between Bitcoin and mimicking portfolio

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python, JAVA, MATLAB, R
Languages: English (fluent); Mandarin (native)

ZIYUAN (ALICE) ZHAO

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EDUCATION

Expected 12/23 **NEW YORK UNIVERSITY**   New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Expected Coursework:* OOP in Java, test-driven development, Black-Scholes model, stochastic calculus, ARMA & GARCH models, LASSO & ridge regression, PCA & SVD, neural networks

09/19 - 08/21 **UNIVERSITY OF MICHIGAN**   Ann Arbor, MI
B.S. in Mathematics of Finance and Risk Management, Minor in Computer Science
- *Coursework:* probability and statistics, algorithms and data structures (C++), linear algebra

EXPERIENCE

07/23 - 09/23 **ELEVEN SQUARED LLC** (Asset management firm)   New York, NY
Quantitative Researcher Intern (Python, SQL)
- Evaluated and selected fundamental, technical, and macro factors based on risk-adjusted rank IC
- Developed and back-tested daily-rebalanced long-short systematic trading strategies based on dynamic factor models, achieving 1.63 Sharpe ratio and 28% annual return
- Constructed machine learning models (random forest, LSTM) to predict ETF movements, contributing to asset allocation decisions; achieved 70% winning rate, and 1.82 Sharpe ratio
- Generated trade ideas and executed orders to adjust portfolios and option hedging positions
- Managed internal research database using SQL server, overseeing collection of historical option pricing and risk data, as well as retrieving and aggregating data for modeling

07/20 - 12/20, **MOYI TECH** (Fin-tech firm that automates market research and data analysis)   Remote
06/21 - 08/21 **Quantitative Analyst Intern (Python)**
- Established factor pools for stocks based on WorldQuant "101 Formulaic Alphas" paper; developed feature-selection framework using Alphalens Python package
- Developed trading strategies based on rank IC weighted factor values; evaluated strategy performance using Python Pyfolio; achieved 1.55 Sharpe ratio and 12.7% annual return
- Recognized stock candlestick patterns using TA-Lib Python package to generate trading signals; back-tested strategies based on top 5 predictive signals selected by Sharpe ratio
- Developed MMAC and mean reversion strategies on Bitcoin, achieving annual Sharpe ratio of 1.95 and max drawdown of 11.3% (using data from 2018 to 2020)
- Constructed AR model for Bitcoin by using ACF/PACF/AIC analyses; applied white noise test and built GARCH model to explain fat tail and volatility clustering

12/18 - 03/19 **GALAXY SECURITIES**   Beijing, China
Analyst Intern, Commercial Retail Industry
- Built up DCF and comparable analysis models for company valuations; ranked stocks based on estimated price/market price, P/S, P/E, and P/B
- Designed market-neutral long/short strategy by longing top decile and shorting bottom decile with monthly rebalancing; obtained annual Sharpe ratio of 1.52

PROJECT

06/22 - 07/22 **Default Modeling For Single-family Mortgage**
- Collected individual loan data from Freddie Mac; analyzed default trend of mortgage borrowers by combining origination data with monthly performance data
- Conducted data cleaning, exploratory data analysis, data transformation, and data quality checks
- Used logistic regression, K-means, random forest, and neural networks to predict debt default
- Applied cross-validation to reduce possibility of over-fitting and guarantee model robustness; evaluated model performance by ROC curve and AUC metrics, with 82% precision

COMPUTATIONAL SKILLS

Technical: Python (Numpy, Pandas, Matplotlib, Sklearn), C++, Java, SQL, R, VBA, Tableau

RUIHAN ZHUANG

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EDUCATION

09/2022 - 12/2023 **NEW YORK UNIVERSITY**   New York, NY
M.S. in Mathematics in Finance, The Courant Institute of Mathematical Sciences
- *Coursework Highlights:* Optimal execution (Almgren et al), risk and portfolio management

09/2018 - 03/2022 **UNIVERSITY OF CALIFORNIA SAN DIEGO**   San Diego, CA
B.S. in Mathematics-Computer Science
- *Coursework Highlights:* Non-numerical algorithms (e.g., greedy, graphs), data structures
- *Honors:* 2021-2022 Physical Science Dean's Undergraduate Award, Cum Laude (GPA top 14%)

EXPERIENCE

07/2023 - now **DEFINITE CAPITAL MANAGEMENT**   Beijing, China
Quantitative Crypto Trader Intern
- Performed market making on USDT perpetual contracts; fine tuned trading strategy to improve risk-adjusted return and balance exposure of risk across different contracts
- Filtered and classified 200 contracts available on Binance based on factors including liquidity and market impact costs; automated generation of trading parameters based on classifications
- Extracted statistics useful for filtering and parameter fine-tuning using millisecond-level snapshot data from crypto-currency exchanges

07/2022 - 08/2022 **E FUND MANAGEMENT** (Largest public fund in China, AUM $3T)   Guangzhou, China
Fundamental Investment Analyst Intern
- Proposed positive perspective on new-energy vehicle industry based on research reports: industry exhibited robust sales performance despite less-than-favorable government policies
- Suggested sustainability of Chinese automobile company BYD's success based on its technical advantages in battery design and superior operation cost control compared to similar car models
- Pitched long position in BYD stock, given industry's promising future, as well as BYD's high market share and sustainability of its success

07/2021 - 08/2021 **CHENGQI ASSET MANAGEMENT**   Shenzhen, China
Quantitative Research Analyst Intern (Python)
- Designed sentiment score based on stock analysts' ratings, with higher score representing more optimistic sentiment
- Replicated prevailing price-volume signals (e.g., momentum, reversion)
- Backtested and improved signals based on performance metrics (e.g., information ratio); tested their correlation with existing signals in signal pool (for CSI 500 index enhancing purposes)

PROJECTS

02/2023 - 04/2023 **Mass Market Data Processing and Covariance Matrix Estimation (Python)**   New York, NY
- Adjusted (for dividends) 3-month second-level trades and quotes tick data of S&P 500 stocks and removed outliers outside of Bollinger band
- Bucketed second-level trade data with optimal minute span that generated non-autocorrelated return series (calculated with first and last trade prices) without bid ask bounce effect
- Calculated more accurate covariance matrix based on bucketed minute-level return series

01/2023 - 03/2023 **Nonlinear Pair Trading Strategy (Python)**   New York, NY
- Programmed reusable backtest module that prevented data snooping
- Optimized pair-trading strategy's trading thresholds by fitting Ornstein-Uhlenbeck model
- Filtered trading signals using mean-reversion half-life of spreads and VIX's performance

12/2020 - 06/2021 **Combinatorial Game Theory App Development and Research** (**Javascript**)   San Diego, CA
- Programmed and designed UIs for 2 math games in both website and native app forms
- Designed new modules in open-source toolkit with recursive programming to compute theoretical values of the math games' positions for further research

COMPUTATIONAL SKILLS

- *Programming Languages:* Java, Python, C++, C, JavaScript, R

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OUR STUDENTS ARE READY TO GET WORK.

Connect with the students directly, or contact
MathFin's Office of Career Services at:
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