

EDUCATION**University of Rochester***B.S. Statistics & B.S. Finance | GPA: 3.70 / 4.00 | Dean's List All Semesters**Certificate of Achievement in Actuarial Studies (In Progress)***Relevant Coursework:** *Statistical Methodology, Financial Statement Analysis, Investments, Statistical Computing in R, Financial Management, Accounting, Corporate Finance***Skills:** Python, R, SQL, Excel (Advanced), Tableau, Power BI, Financial Modeling, DCF/WACC/CAPM, Sensitivity Analysis, Regression Modeling, Bayesian/MCMC Methods, Monte Carlo Simulation, Data Visualization, AI-Assisted Development (Claude Code), LLM/API Integration, Prompt Engineering**Language:** English, Mandarin, Cantonese, Fuzhounese**Expected June 2027***Rochester, NY***PROJECTS****FRTB IMA Risk Monitor: Automated VaR & Expected Shortfall Pipeline****May 2026 – Current***Python, PostgreSQL, Plotly Dash, Docker, Claude Code/API | Independent Project | github.com/marksguo/frtb-ima-risk-monitor*

- Architected and shipped a production-grade FRTB Internal Models Approach risk system by directing Claude Code (agentic AI) to build the full Python codebase, while personally owning the risk methodology, validation, and system design
- Computed 97.5% Historical Simulation VaR and Expected Shortfall (with parametric and Monte Carlo Student-t comparisons), stress-calibrated and liquidity-horizon-adjusted ES, and an Internal Models vs Standardised Approach capital charge under the Basel III output floor, across a 6-asset multi-class book (29,000+ daily observations, 2007-2026)
- Backtested ES weekly (Acerbi-Szekely) alongside Kupiec and Christoffersen VaR tests; quantified that a 252-day historical-simulation ES underestimates tail risk in 54% of weeks during volatility regime shifts, demonstrating the procyclicality that motivates FRTB's stressed-ES capital floor
- Engineered the system end-to-end: a pytest suite with GitHub Actions CI, a Dockerized stack, and a live Plotly Dash dashboard deployed online, plus a daily cloud-automation run (GitHub Actions cron) with an event detector that flags volatility-regime shifts, ES spikes, 60-day highs, and weekly backtest breaches
- Integrated the Anthropic Claude API to auto-generate analyst-grade narrative risk summaries and an event-driven publishing pipeline that renders matplotlib risk cards with AI-written desk recaps, plus a plain-English explainer for non-technical readers; validated all AI-generated code as the human-in-the-loop in a public GitHub repository

Beyond U-3: Labor Market Dashboard**May 2026 – Current***Python, PostgreSQL, SQL, Tableau, Claude, FRED API, pandas, SQLAlchemy*

- Designed and built a normalized PostgreSQL relational database from scratch to store and analyze 14 Federal Reserve economic time series spanning 30+ years of U.S. labor market data
- Developed advanced SQL queries with Claude (AI), including multi-table joins, window functions, rolling averages, and CASE-based recession-period classification; validated and analyzed the output to quantify that the official unemployment rate understates labor stress by an average of 4.42 percentage points in normal periods and 5.37 points during the Great Recession
- Built an automated Python data pipeline using the FRED API, pandas, and SQLAlchemy to programmatically fetch, resample, and load mixed-frequency time series (monthly, weekly, daily) into PostgreSQL; pipeline dynamically calculates derived metrics including U-3/U-6 gap and temp help employment decline from all-time peak
- Scheduled pipeline via Windows Task Scheduler to auto-execute monthly following BLS data releases, maintaining a live production database without manual intervention
- Used Claude (AI) to scrape and synthesize research on recession dynamics, identifying 8 leading indicators (temporary help employment down 21.4% from peak, quits rate, yield curve spread, personal saving rate, and credit card delinquency) used as early-warning signals
- Built a 4-chart Tableau Public dashboard with Claude (AI), featuring intentional axis methodology, synchronized dual axes, and recession-period analysis; publicly accessible and linked on GitHub

Quantitative Risk Modeling: S&P 500 Volatility Prediction**January – May 2026***Python, R | Independent Research Project | github.com/marksguo/SPY-Volatility-Modeling*

- Built and compared OLS, WLS, and Robust M-estimation models on 4,800+ daily S&P 500 returns (2007–2026) to predict financial volatility and quantify risk persistence.
- Confirmed statistically significant volatility clustering ($p < 0.0001$); findings directly support dynamic VaR estimation and portfolio risk frameworks used in industry.
- Validated model performance via 70/30 train-test split with full diagnostic suite: heteroscedasticity testing, ACF analysis, and Cook's distance influence detection.

Bayesian Hierarchical Modeling: Uncertainty Quantification**September 2025 – March 2026***R | Independent Research Project*

- Independently implemented a hierarchical Bayesian model with a custom Metropolis-Hastings sampler; ran 4 Markov chains of 100,000 iterations each to estimate group-level probabilities.
- Confirmed full convergence via Gelman-Rubin diagnostics (PSRF = 1.0); achieved effective sample sizes exceeding 26,000 across all chains.
- Delivered probabilistic findings with 95% credible intervals and actionable business recommendations for non-technical audiences.

Amazon.com, Inc. Financial Statement Analysis & Equity Valuation

January – April 2025

Excel | Independent Research Project

- Built a 5-year pro forma model and DCF valuation using CAPM-derived WACC across multiple macroeconomic scenarios; stress-tested assumptions via sensitivity analysis on beta, WACC, and terminal growth rate.
- Conducted trend, common-size, and ratio analysis across profitability, liquidity, leverage, and default risk; produced a structured equity research report with a supported “Hold” recommendation.

University Financial Position & Resource Allocation Research

February – April 2024

Excel | Collaborative Research with Prof. Michael Rizzo

- Analyzed financial statements and endowment data across 11 universities using NACUBO and IPEDS; identified significant correlation between endowment-per-student and U.S. News rankings.
- Presented findings to Economics faculty with data-driven conclusions on institutional resource allocation tradeoffs.

WORK EXPERIENCE

China Fun of NC, Inc.

September 2017 – July 2025

Junior Financial & Operations Analyst

Charlotte, NC

- Drove 25% revenue growth (~\$375K incremental annually) at a \$1.5M+ revenue operation by identifying margin expansion opportunities and implementing data-driven process improvements across procurement, fulfillment, and labor allocation.
- Monitored and analyzed food cost ratios against a ~32% COGS target; identified \$10K+ in annual ingredient savings through vendor renegotiation and waste reduction strategies across \$30K+ in monthly procurement.
- Built a 2,000-cell Excel order management and financial tracking system integrated with DoorDash, improving transaction accuracy across 150+ daily orders and reducing fulfillment errors — equivalent to reconciling \$125K+ in monthly revenue.
- Prepared monthly P&L summaries tracking revenue, labor cost (~28% of sales), and food cost across dine-in and delivery channels; presented findings to ownership to support operational and budgetary decisions.
- Managed seasonal cash flow planning around high-volume periods (Chinese New Year, summer), maintaining procurement schedules and cash reserves during slow months to sustain consistent operations.
- Reconciled daily POS receipts against bank deposits with <0.5% discrepancy; maintained accounts payable records across multiple suppliers and supported quarterly tax documentation for CPA-led filings.
- Monitored front-of-house vs. back-of-house labor costs as a % of revenue; processed bi-weekly payroll for 15+ employees and ensured tip reporting compliance with IRS guidelines.
- Trained 10+ staff on POS and operational systems, achieving a 30% efficiency gain, leading to reducing per-transaction labor cost and improving throughput during peak periods.

LEADERSHIP AND COMMUNITY INVOLVEMENT

Tien Ren Cultural & Educational Foundation

Summer 2015 – Current

Lecturer & Event Organizer (2021–Present) | Assistant Lecturer (2019–2021)

Indian Trail, NC

- Delivered 30+ educational sessions to ~1,000 youths (ages 14–20); organized 3 annual volunteer events at Second Food Bank of Metrolina.

INTERESTS

Personal Interests: Quantitative Finance, Risk Management, Actuarial Science, Entrepreneurship, Networking, Chinese Literature & History, Mathematics, Self-Study, Music