

# Ningyuan (Howard) Xie, CFA, FRM

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## PROFESSIONAL EXPERIENCE

### • Reinsurance Group of America, Incorporated

Global HQ | Chesterfield, MO

Senior Financial Risk Analyst, Market Risk Services

Mar. 2023 – Present

- **Team Leadership:** Led and mentored risk interns and junior analysts over multiple years, providing guidance on recurring and ad-hoc tasks; successfully transitioned all 5 interns to full-time positions through project completion and skill development
- **Option Validation:** Architected and deployed an automated **VBA** workflow for market data ingestion and option spread pricing across multiple indices, streamlining validation of recurring trading activities and reducing processing time by 75%
- **Market-Neutral Hedging:** Monitored daily Greeks and P&L of hedged positions through real-time market dashboards; executed strategic hedging trades with derivative instruments to maintain market-neutral exposures within +2%/-2% delta and rho limits
- **Dynamic Option Strategy:** Developed and backtested a delta hedging strategy in **MATLAB** that calculated values and deltas of bull call spreads, while dynamically replicating delta exposure with equity futures, achieving 95%+ hedge effectiveness
- **Rolling Option Strategy:** Engineered and backtested a 5-year rolling strategy in **MATLAB** incorporating annual participation adjustments and payoff reinvestment; delivered 30%+ annualized returns while maintaining 4% annual cost constraints
- **Static Option Strategy:** Developed and backtested a bull call spread strategy in **VBA** with **Excel Solver** optimization for reverse-engineering optimal strikes; enabled efficient batch scenario analysis across 20+ years of daily time series data
- **Liability Hedging:** Constructed risk-neutral liability reserve models in **VBA** and built optimized swaption portfolios that replicated liability cash flows by minimizing net cash flow deviations, improving hedging efficiency and portfolio monitoring

Financial Risk Analyst, Market Risk Services

Jan. 2021 – Mar. 2023

- **Real-World Rates Modeling:** Engineered dynamic factor models in **MATLAB** to analyze treasury and credit spreads via time-varying level, slope, and curvature factors; calibrated AR processes to forecast real-world yield curves for liability valuation
- **Real-World Equity Modeling:** Modeled equity returns in **MATLAB** as risk-free rates plus risk premiums, capturing volatility dynamics through GARCH; calibrated ARMA-GARCH to simulate real-world equity return paths for capital and risk projections
- **Risk-Neutral Rates Modeling:** Built interest rate models using **Numerix Python SDK**, encompassing workflows from derivative calibration to economic scenario generation; processed forecasted rates and discount factors for liability modeling
- **Risk-Neutral Equity Modeling:** Engineered equity models in **Numerix Excel** with GAAP volatility calibration and risk-neutral equity path simulation; validated and processed model outputs for liability modeling using custom **MATLAB** scripts

Risk Management Intern, Market Risk Services

Sept. 2020 – Jan. 2021

- **Market Data Processing:** Extracted and processed raw market data from **Bloomberg Terminal**; applied no-arbitrage constraints to clean interest rate data in **MATLAB**, establishing company-wide reference rates for critical model inputs
- **Workflow Automation:** Developed comprehensive automation tools in **Python**, **MATLAB**, and **VBA** for data ingestion, curve construction, scenario preprocessing, and derivative hedging workflows, accelerating production processes by 20%

## PROJECT EXPERIENCE

### • Academic Data Analytics Platform | *Python, Dash Plotly, MySQL, MongoDB, Neo4j, AWS, Render* | [website](#) | [🐙](#)

- **Full-Stack Development:** Architected a comprehensive web-based analytics dashboard enabling prospective graduate applicants to explore academic programs, compare universities, and identify prominent researchers through interactive data visualizations
- **Cloud Infrastructure:** Deployed multi-database architecture utilizing AWS RDS, MongoDB Atlas, and Neo4j Aura for scalable backend services; implemented seamless hosting on Render for real-time updates

### • Mobile Weather Application | *Android Studio, Java*

- **Android Development:** Engineered a feature-rich weather application with secure user authentication, customizable UI themes, real-time weather data integration via Google Maps API, and AI-powered Q&A functionality using Gemini API
- **Quality Assurance:** Implemented comprehensive test automation with Espresso framework, developing instrumented tests to validate core functionalities and ensure application stability across diverse user scenarios

### • C++ Systems & Game Development | *Visual Studio, C++* | [🐙](#) [🐙](#)

- **Game Development:** Developed 2D console-based games in C++ including Tic-tac-toe with AI opponent and Gomoku with configurable board dimensions and winning conditions, implementing object-oriented design patterns and algorithms
- **File System Implementation:** Built a modular file system supporting core operations (create, delete, open, close) with password-based security; developed custom shell commands (**ls**, **rm**, **cat**, **copy**) for efficient terminal-based file management

### • Computer Vision & Neural Networks | *Jupyter, Python, TensorFlow/Keras*

- **Image Processing & Feature Engineering:** Preprocessed 45,000+ paperclip images with noise reduction techniques; engineered features by extracting RGB pixel intensities to optimize model training performance
- **Neural Network Architecture:** Designed and trained a 4-layer neural network using TensorFlow/Keras framework to predict paperclip quantities from extracted features, achieving RMSE  $\leq 2.0$  and 92% validation accuracy

## TECHNICAL SKILLS

**Programming:** Python, MATLAB, VBA, R, SQL, C++, Java, HTML/CSS,  $\LaTeX$

**Developer Tools:** VS Code, JetBrains IDEs, Jupyter Notebook, Google Colab, Git, Bloomberg Terminal, Numerix SDK

**Databases & Cloud:** MySQL, MongoDB, Neo4j, AWS (RDS), Render

**ML & AI Frameworks:** PyTorch, TensorFlow/Keras, Scikit-learn

## EDUCATION

### • University of Illinois Urbana-Champaign, Siebel School of Computing and Data Science

Champaign, IL

Master of Computer Science | GPA: 4.00/4.00

May 2024 – May 2027 (Expected)

### • Washington University in St. Louis, Olin Business School

St. Louis, MO

M.S. in Finance—Quantitative Finance | GPA: 3.99/4.00 (1/102), GMAT: 750 (98%)

July 2019 – Jan. 2021

- **Honors:** Charles F. Knight Scholar & Outstanding Finance Student Award—Quantitative (Top 1)

### • University of Nottingham, Nottingham University Business School

Nottingham, UK

B.S. in Finance, Accounting and Management | GPA: 3.90/4.00, First Class Honours

Aug. 2015 – June 2019

- **Honors:** Provost's Scholarship 2018 (1.5%), Best Student of the Year 2017 (Top 1), President's Scholarship 2017 & 2016 (1%)