

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

- **Hedging Trades:** Monitored daily Greeks and P&L of hedged positions using a real-time market dashboard; executed sizing trades with equity futures and interest rate swaps to maintain market-neutral exposures, minimizing risk and P&L volatility
- **Static Option Strategy:** Developed and backtested a static bull call spread strategy in **VBA**; calculated hedging costs and P&L, and leveraged **Excel Solver** to reverse-engineer the optimal short OTM strike given budget, enabling batch scenario analysis
- **Dynamic Option Strategy:** Designed and backtested a delta hedging strategy in **MATLAB**; calculated daily value and delta of a bull call spread until maturity, and dynamically replicated delta exposure using equity futures; achieved hedge effectiveness – measured by changes in the underlying equity index vs. changes in the spread's delta – close to 95%
- **Rolling Option Strategy:** Designed and backtested a 5Y rolling option strategy in **MATLAB**; adjusted participation annually under fixed budget and reinvested payoffs into future notionals; achieved return $\geq 30\%$ under a 4% annual cost
- **Liability Hedging Strategy:** Modeled liability reserves using risk-neutral scenarios in **VBA**; used **MATLAB** to construct a swaption portfolio replicating liability CFs by minimizing the absolute value of net CFs, monitoring the portfolio more efficiently

Financial Risk Analyst, Market Risk Services

Jan. 2021 – Mar. 2023

- **Quantitative Modeling:** Engineered factor models in **MATLAB** to analyze treasury and credit spreads using time-varying level, slope, and curvature components; calibrated autoregressive models and forecasted real-world interest rate curves
- **Quantitative Modeling:** Modeled equity returns in **MATLAB** as risk-free rate plus premium, with volatility captured via GARCH; calibrated in-sample volatility and forecasted real-world returns using ARMA-GARCH model
- **Quantitative Development:** Built hybrid risk-neutral models (**Hull-White Two-Factor**, **Black-Scholes**, **Heston**) in **Python** with **Numerix SDK** for derivative calibration and scenario generation
- **Quantitative Development:** Used **Numerix Excel** to develop Local Vol model calibrated to GAAP vol; simulated risk-neutral equity paths and validated model quality with custom **MATLAB** diagnostics (vol error, martingale tests)

Risk Management Intern, Market Risk Services

Sept. 2020 – Jan. 2021

- **Data Cleaning:** Collected and processed raw market data from **Bloomberg**; cleaned interest rate and equity time series in **MATLAB** under no-arbitrage assumptions (e.g., limited negative forwards, credit cross-over checks) as various models' inputs
- **Automation Development:** Developed reusable tools in **Python**, **MATLAB**, and **VBA** for data ingestion, curve construction, scenario preprocessing, and derivative hedging workflows, speeding up the production process and reducing human error

PROJECT EXPERIENCE

• Database Systems | VS Code, Python, Dash Plotly, MySQL, MongoDB, Neo4j, AWS, Render | [website](#) | [🐙](#) May 2025

- **Interactive Dashboard:** Designed and developed “GradXplorer”, a web-based dashboard enabling potential grad school applicants to explore academia, compare universities, and identify prominent researchers through intuitive visualizations
- **Full-Stack Development:** Built the frontend with Dash, incorporating interactive widgets for querying and modifying data, while integrating MySQL, MongoDB, and Neo4j as backend databases to manage academic information efficiently
- **Cloud Deployment:** Utilized AWS (RDS), MongoDB Atlas, and Neo4j Aura to host cloud databases, and deployed the application on Render for seamless hosting and real-time updates

• Software Engineering | Android Studio, Java

Dec. 2024

- **Android App Development:** Built a feature-rich weather app with user authentication, customizable UI themes, real-time weather and map integration via Google API, and AI-powered weather Q&A using Gemini API
- **Automated Testing:** Developed comprehensive instrumented tests with the Espresso framework to validate core functionalities, ensuring app stability and reliability across different user scenarios

• Object-Oriented Software Development Lab | Visual Studio, C++ | [🐙](#) [🐙](#)

Aug. 2020

- **Console Game Programming:** Built 2D console-based games in C++ including TicTacToe (with AI opponent) and Gomoku (with customizable board size and winning rules), applying OOP principles and design patterns
- **Simulated File System:** Implemented a modular file system supporting file operations (create, delete, open, close) with password protection, and developed custom shell commands (e.g., `ls`, `rm`, `cat`, `copy`) to enable interactive terminal-based file manipulation

• Applications of Deep Neural Networks | Jupyter, Python, TensorFlow

May 2020

- **Pattern Recognition:** Preprocessed raw paperclips images to reduce noise, and performed feature engineering by extracting average RGB pixel depths and frequency; applied these features as independent variables for training
- **Predictive Model Design:** Designed a 4-layer neural network using the TensorFlow/Keras framework; trained model on 45,000 samples with extracted features x and labels y to predict the number of paperclips, achieving an RMSE of ≤ 2.0

TECHNICAL SKILLS

Programming: Python, MATLAB, VBA (Microsoft Office Suite), R, SQL, C++, Java, HTML/CSS, \LaTeX
Developer Tools: VS Code, JetBrains IDEs, Jupyter Notebook, Google Colab, RStudio, Git, Bloomberg API, Numerix SDK
Databases & Cloud: MySQL, MongoDB, Neo4j, AWS (RDS), Render
ML & AI Frameworks: PyTorch, TensorFlow/Keras, Scikit-learn, GPT API

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 – Dec. 2027

• 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

- **Honor:** 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 Honors

Aug. 2015 – June 2019

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