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%)**