**Hao Quan**

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**EDUCATION**

University of Illinois–Urbana Champaign Champaign, IL, USA

BS in Actuarial Sciences and Statistics | Dean’s List Dec 2022

University of Waterloo Waterloo, ON, CA

MMath in Actuarial Sciences | Supervisor: Mingbin (Ben) Feng Sep 2024

University of Waterloo Waterloo, ON, CA

PhD in Actuarial Sciences | In progress | Supervisor: Mingbin (Ben) Feng Sep 2027 (Expected)

**PROFESSIONAL EXAMS**

SOA Exam P: Passed (2024)

SOA Exam SRM: Passed (2024)

SOA Exam FM: Passed (2020)

**PROFESSIONAL EXPERIENCE**

**UBS AG** Shanghai, China

Remote Quantitative Analysis Part-Time Assistant Aug – Sep 2022

* Applied time-series regression models to historical US treasury futures data in Python
* Reviewed and experimented with different futures pricing models
* Performed one-year back testing, conducted sensitivity analysis, and compared with benchmark
* Beat baseline model performance and drafted deliverable as reference for broader strategy efforts

**Shokz (Rising Bone Conduction Headphone Brand)** Chicago, IL

Part-time Marketing Analyst Dec 2021 – Jul 2022

* Used SQL to exact data and generated weekly sales and profitability reports among Shokz’s offline retail store channels
* Analyzed sales data from Statista and internal sales and financial data from selected retailers like Costco and Dicks; created dashboards and visuals to support decisions in new partnership
* Performed unsupervised learning using clustering analysis of demographic data of selected regions for new store locations
* Conducted principal component analysis to further pinpoint Shokz’s market expansion strategies

**KPMG** Shanghai, China

Elite Program Intern May - Aug 2021

* Evaluated Citi Bank’s digital transformation using the Open Digital Maturity Model with 6 dimensions and 174 metrics
* Identified problems in Citi’s data integration, extracted relevant data and did feature engineering
* Converted results into insights and actional plans and presented to manager for review in a team of 5
* Supported Citi’s profiling of high net-worth clients by summarizing statistics and creating dashboards using its Customer Relationship Management (CRM) system to guide future consumer services

**China Life** Beijing, China

Actuarial Intern Dec 2020 – Feb 2021

* Reassessed risks with sensitivity analysis and stress testing and regenerated relevant disclosures on 50+ insurance products in accordance with IFRS-17 updated regulations
* Analyzed gross premium reserves of multiple insurance and annuity products of the past 20 years using Excel and VBA
* Developed an automated gross premium reserves calculation tool using Python and regression and back-tested the model using past data for improved accuracy.

**China Everbright Bank Co., Ltd**  Beijing, China Comprehensive Clerk Jun – Aug 2020

* Established and maintained a CRM database for 34 branches across China
* Created additional performance metrics and benchmarking designs; developed frequently-used commands in Excel and pertinent dataset for automatic weekly and monthly reports and dashboards

**ACADEMIC PROJECTS**

**Two Stage Model for Stock selection and Asset Allocation**

* Reviewed relevant literature built a deep learning model for stock selection and used mean-variance model for asset allocation
* Designed a stock random selector to automatically obtain stock history data
* Compared the performance of Random Forest, extreme learning machine, support vector machine, back propagation neural network, and long-short term memory using run time, MSE, RMSE, MAE, and hit rate
* Used Mean-Variance Optimization to determine the optimal asset allocation that maximizes return for a given level of risk

**Variable Annuities Portfolio Fee Determination via Monte Carlo Simulation and Stochastic Root-Finding**

* Reviewed actuarial and financial literature on variable annuity riders (GMDB, GMAB, GMWB) and built Monte Carlo simulation models to capture mortality and market risks
* Estimated expected present values of benefits under diverse fee structure
* Employed stochastic gradient estimation techniques (finite differences and infinitesimal perturbation analysis) to compute sensitivities and solve the root-finding problem, analyzing convergence properties and computational performance to enhance pricing accuracy
* Developed a hot start algorithm to elevate the Fee estimation process for a large variable annuity portfolio
* Refine a three-stage model (Compressor-Simulator-Predictor) using augmentation.

**TEACHING ASSISTANT**

**University of Waterloo**

Graduate-level course:

* MATH 631: Statistics for Teachers (2024 Winter)
* STAT 940: Deep Learning (2025 Winter)
* ACTSC 631: Financial Mathematics 3 (2025 Spring)
* ACTSC 634: Quantitative Risk Management (2025 Spring)

Undergraduate-level course:

* ACTSC 372: Investment Science and Corporate Finance (2025 Winter, 2025 Spring)
* STAT 372: Sampling and Experimental Design Techniques for Business (2024 Spring)
* STAT 230: Probability (2024 Winter, 2024 Spring)
* ACTSC 231: Introductory Financial Mathematics (2023 Fall, 2024 Fall)
* COMM 101: Introduction to Financial Markets (2023 Fall, 2024 Fall)

**University of Illinois at Urbana-Champaign**

* ASRM 461: Loss Models (2022 Fall)
* ASRM 471: Life Contingencies (2022 Fall)

**SKILLS & ACTIVITIES**

* Programming: Python, R, SQL, VB programming, STATA, Excel Data Analysis and ANOVA
* Activities: HR Department of UIUC Chinese Scholar and Student Association (organized 5 events with average 50+ attendees in 2020)