Zijian Xie

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EDUCATION

Duke University, Fuqua School of Business **Durham, NC**
M.S. in Quantitative Management: Business Analytics 2024 - 2025
- GPA: 3.5/4

Rutgers University **New Brunswick, NJ**
B.S. in Business Analytics and Information Techonology, Supply Chain Management and Marketing Science 2020 - 2024
- Honor, Cum Laude, Dean's List on Spring 2024, 2023, Fall 2022, and Fall 2021
- Teaching Assistant in Supply Chain Management Class
- GPA: 3.6/4

RESEARCH INTERESTS

Marketing Science, AI for Decision Making, Operation Management, Data Science, Casual Inference

RESEARCH EXPERIENCE

Corporate Digital Twin - Advised by Dr. Tianyi Peng **CBS, Columbia**
Research Assistant Aug. 2025 - Current
- Construct digital twins of S&P 500 CEOs (2004–2024) by integrating earnings call transcripts, press releases, and leadership demographics.
- Developed initial pipeline to scrape executive demographic information from public sources (Wikipedia, LinkedIn, corporate websites), ensuring accurate linkage with identifiers (GVKEY, EXECID).
- Assisting in building a large-scale dataset of 1,700+ CEOs with over 20 years of earnings calls, aimed at enabling behavioral and decision-making analysis in accounting and finance research.
- Contributing to the design of automated text analysis workflows (Hogan assessment, sentiment, reasoning extraction) to evaluate CEO communication style and strategic orientation.

Bayesian Analysis of Longitudinal Athlete Data - Advised by Dr. Di Gao **Sam Houston State University**
Research Assistant May. 2025 - Aug. 2025
- Applied hierarchical Bayesian modeling to evaluate group-by-time interactions on weekly performance metrics across a 16-week training period, accounting for individual-level random effects.
- Conducted model diagnostics, posterior predictive checks, and Bayes Factor comparisons to quantify uncertainty and interpret longitudinal group differences in the context of hormonal intervention.

Time Series Forecasting for Pricing Strategy **Fuqua, Duke**
Course Project Leader
- Developed time series models to forecast future product prices based on competitors' historical pricing, supporting strategic pricing decisions.
- Applied TBATS and Seasonal ARIMA (SARIMA) models, and conducted seasonality diagnostics using seasonality strength index, autocorrelation function (ACF) plots, and the Kruskal-Wallis test.
- Implemented train/test split for model validation to ensure forecasting accuracy and generalizability.

Impact of Sleep Duration on Students Mental Health **Fuqua, Duke**
Course Project Leader
- Investigated the reciprocal causality between sleep deprivation and adolescent depression using econometric analysis.
- Applied Matching, Instrumental Variables (IV), and Heterogeneous Treatment Effects (HTE) to supplement standard logistic regression.
- Found that students sleeping over six hours per night had a 3.88% lower likelihood of depression, with effects varying across demographic subgroups.

Modeling Insurance Strategy for American Airlines **Fuqua, Duke**
Course Project Leader
- Developed a Monte Carlo simulation model to evaluate insurance renewal options for American Airlines.
- Analyzed risk exposure and total cost scenarios under various self-insurance contracts, optimizing decision-making via probabilistic forecasting.
- Provided data-driven insights to enhance risk management and cost-effectiveness in corporate insurance strategy.

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Driver Drowsiness Detection With Convolutional Neural Network **Fuqua, Duke**
Course Project Leader
- Designed a CNN-based system for driver drowsiness detection using a dataset of 40,000+ labeled images.
- Preprocessed and converted images into PyTorch tensors, enhancing model compatibility and efficiency and achieved 93% test accuracy, outperforming pre-trained models such as ResNet in benchmark comparisons.

Credit Card Fraud Detection Using Random Forest Classification **Fuqua, Duke**
Course Project Leader
- Developed a real-time fraud detection system using a Random Forest classifier on a simulated dataset from Kaggle.
- Evaluated model performance based on Accuracy, Precision, Recall, and F1-score, optimizing fraud detection while minimizing false positives.
- Enhanced model efficiency by reducing dimensionality using Principal Component Analysis to retain only the most informative features.

PROFESSIONAL EXPERIENCE

Jones Lang Lasalle
Data Analyst Intern Jul. 2023 - Sep. 2023
- Designed a Monte Carlo simulation to assess $1B insurance risk exposure, enabling executives to make recession-based capital allocation decisions, improving targeting efficiency by 6% based on return on equity.
- Applied K-Means clustering to analyze investment patterns, leading to a segmentation overhaul that increased client engagement in underperforming regions.
- Forecasted housing prices for 200 apartments using Random Forest and Gradient Boosting Models in R, improving prediction accuracy by 5% and driving a 15% increase in strategic decision-making efficiency for housing investments.
- Managed customer escalation case analysis by building Tableau dashboards that visualized risk metrics and post-transaction trends, reducing decision cycle time by 20% and improving SLA compliance.

Siemens
Data Engineer Intern May. 2023 - Jul. 2023
- Developed Python & SQL-based fraud detection dashboards that accelerated anomaly detection by 35%, supporting ~300 transaction investigations daily.
- Automated escalation flagging via Excel VBA, reducing manual review workload by 30% while improving audit traceability and incident management efficiency.
- Built real-time Tableau dashboards for multi-line equipment operations, boosting operational response rates and enabling faster issue resolution.

Procter & Gamble
Supply Chain Associate Intern Jun. 2023 - Mar. 2023
- Deployed stochastic optimization techniques and dynamic programming to refine procurement cycles and manage inventory volatility, leading to a 7% increase in supply chain efficiency.
- Built supplier evaluation system integrating Decision Tree models for capability analysis, reducing procurement costs by 8% while improving supplier performance tracking accuracy.

SKILLS

- **Technical Tools:** Microsoft Office, MATLAB, R, Stata, Python, Pytorch, Excel, LATEX, SQL, Tableau
- **Skills and Capabilities:** Regression Analysis, Factor Analysis, PCA, Data Visualization, Statistical Modeling, Forecasting, Dynamic Programming, Time Series Modeling, Data Mining, AB Testing, Stochastic Calculus
- **Languages:** English, Mandarin