

XINRAN (KATHERINE) ZHANG

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EDUCATION

UNIVERSITY OF SYDNEY

Bachelor of Science, Major in Statistics and Financial Mathematics

- Weighted Average Mark: 90.5 / 100

SYDNEY, AUSTRALIA

Aug 2020 – Jun 2023

THE WHARTON SCHOOL, UNIVERSITY OF PENNSYLVANIA

Nominated Exchange Student, Concentration in Statistics and Data Science

- GPA: 3.94 / 4.0

PHILADELPHIA, US

Jan 2022 – Jun 2022

RESEARCH EXPERIENCE

CHILDREN'S MEDICAL RESEARCH INSTITUTE

A Data Science Approach to Investigate Human Development

- Integrated 16 large datasets of single-cell transcriptomics data, applied reciprocal PCA and canonical correlation analysis to generate atlas of in vivo and in vitro models of early human development
- Generated the cellular identity scores by using a tool, Cello, on all cell types by batch, performed a systematic evaluation of the results by performing pairwise correlation analysis
- Developed statistical metrics to quantify the degree of likeness, assessed the fidelity of 4 human blastoid generation protocols to recapitulate their human in vivo counterparts

SYDNEY, AUSTRALIA

Sep 2022 – present

FINANCIAL MATHEMATICS CAPSTONE PROJECT

Monte Carlo Method in Option Pricing

- Regarding European and Asian call option pricing, explored methods of variance reduction (antithetic variables, importance sampling, control variates) and generated random paths (Milstein and Euler), compared performance of Monte Carlo method and Crank-Nicolson scheme in Finite Difference method

Portfolio Optimization with Market Data

- Utilized monthly return data of 8 assets, optimized static portfolio and dynamic portfolio for utility maximization and minimum variance respectively, explored further situations with different risk measures and market dynamics

SYDNEY, AUSTRALIA

Jul 2022 – Nov 2022

WORK EXPERIENCE

INDEX CAPITAL, *Hard & Core Technology Department*

Investment Research Intern

- **Industry research:** conducted research of industry trend, market share, competitive analysis regarding autonomous cars, GPU, DPU, and semiconductors, positively influenced the investment decisions of technology group
- **Financing materials:** output 3 pitchbooks independently in the fields of millimeter-wave radar and GPU, built storylines and drew bilingual slides, assisted in financing of billions of CNY
- **Multitasking:** assisted in roadshows, due diligence, and senior executive interviews, wrote meeting minutes, greatly enhanced team productivity

SHANGHAI, CHINA

Aug 2021 – Jan 2022

BYTEDANCE, *Dali Education Department*

Data Analysis Intern

- **SQL:** programmed 1,500+ lines of SQL to select data and retrieve key information for 12 core data indicators regarding sales performance and service quality, processed 10,000+ rows of raw data every day
- **Python:** imported 1,300+ order data from third-party API, aligned data caliber, extracted data from Hive data warehouse and automated data input from a third-party sales platform into our own database
- **Report and presentation:** presented the product department 2 user portrait and A/B test reports, which compared efficiency between dispatch mode and default mode and analyzed significant decline of conversion rate
- **Collaboration:** helped complete data visualization objectives 15 days ahead of schedule, summarized working experience and instructions into a document for incoming interns

HANGZHOU, CHINA

Jun 2021 – Aug 2021

ACCENTURE, *Consulting Department*

Digital Transformation Project Assistant

- **Excel:** collected and organized data of different public cloud platforms infrastructure from company research of AWS, Microsoft Azure, Alibaba Cloud and Huawei Cloud by using advanced Excel functions
- **Tableau:** visualized data using Tableau, produced pie charts and heatmap of companies' market share, bar charts of cloud resource capacity, compared companies' production workloads, service availability, risk control using pie charts
- **Meticulousness:** drew slides, wrote meeting minutes, and ensured all client-side documents had no mistakes

SHANGHAI, CHINA

Apr 2021 – Jun 2021

COURSE PROJECTS

Early social determinants of adolescent wellbeing

- Developed a model of adolescent well-being from early social and structural health determinants, used Fragile Families sample which longitudinally follows 5,000 children from birth to 15, utilized model strategies such as regression with LASSO, and random forest with PCA and bagging

Predict ratings from reviews on Yelp

- Used 100,000 Yelp reviews and ratings to build a classifier, conducted sentiment analysis, and constructed a word cloud to exhibit words for good and bad reviews respectively
- Implemented an 81%+ accurate self-designed Neural Network model to predict ratings from reviews, which had 2 hidden layers with 16 and 8 neurons in each layer, used ReLU as activation function and used Sigmoid as output layer

Readmission probability of diabetes inpatients

- Predicted likelihood of diabetes patients being readmitted within 30 days of hospital discharge, applied LASSO to impose a penalty function, induce sparsity and obtain a parsimonious logistic regression model, variables including patient demographics, medical history, and medication details

COVID-19 mortality rate

- Visualized dynamic evolution of COVID cases and COVID-related death at state level through spaghetti plots and animated heatmaps, built and selected the best multiple regression model with LASSO and BIC that figured out critical county-level demographic and policy interventions associated with mortality rate in the US

Bankruptcy of Pacific Gas and Electric

- Fitted an ARMA-GARCH model of simple monthly returns for Pacific Gas and Electric common stock for the period 1998 through 2021, used a GARCH (1,1) model to address the volatility

Imports by U.S. from China

- Fitted a seasonal ARIMA model with calendar trigonometric pairs to analyze trend and changes of US-to-China imports, presented dynamic seasonal structure, performed a residual analysis with the residual acf, pacf, and spectral density

Ford Motor Green Bond

- Produced a set of 3 different financing alternatives for Ford in the amount of \$1 billion, priced 3 fixed income securities based on recent market data, including fixed coupon bond, floating rate bond, and puttable zero-coupon bond
- Employed Merton Model to quantify the credit risk of Ford and made a prediction about the credit spread

LEADERSHIP & ACTIVITIES

THE RED CROSS

Volunteer

- Served as a volunteer teacher for 2 months in Shanxi Province, kept correspondence with those children after the teaching
- Gave speeches in 9 schools and 15 neighborhoods to collect donations to poverty-stricken and disaster-affected areas
- Volunteered as an assistant for 10+ hours on mobile blood donation and collecting vehicles

MULTI-SITE, CHINA

Sep 2018 – present

PENN QUAKERS VENTURE CLUB

Member in technology industry group

- Invited famous investors and startup CEOs of semiconductors to share industry insights in club workshops
- Conducted industry research of semiconductors and presented in weekly group meetings

PHILADELPHIA, US

Jan 2022 – Jun 2022

2021 ILLUMINERA CAMPUS INNOVATION COMPETITION

Third Place in the National Finals

- Produced marketing solution in China for an elderly vaccine from a multinational pharmaceutical company, designed the promotion strategy towards banks and private hospitals, presented landing strategy by shooting a short film
- Collaborated with 3 teammates, independently analyzed vaccine market trend, whole vaccination process for elderly, and elderly vaccine product analysis benchmarking HPV vaccine

SHANGHAI, CHINA

Oct 2021 – Nov 2021

HONORS & AWARDS

- Charles Perkins Centre Summer Research Scholarship: 10 recipients, \$4,000 Oct 2022
- University of Sydney Academic Merit Prize: Top 1%, \$1,000 May 2022
- Beta Gamma Sigma lifetime member: Top 10% May 2022
- Student Exchange Travel Scholarship: \$2,000 Nov 2021
- Vice Chancellor's Global Mobility Scholarship: \$1,500 May 2021

SKILLS & INTERESTS

- Technical: R, Python, MATLAB, Tableau, Stata, Latex, Adobe Photoshop, Adobe Premiere
- Languages: English (IELTS 7.5), Mandarin (native speaker)
- Interests: Photography, Dancing, Musical (25,000+ followers at Weibo)