Zhengwei Song

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EDUCATION

Columbia University Mailman School of Public Health, NY Sep 2022 – Present

MSc Biostatistics (GPA: 3.96)

- Relevant Coursework: Biostatistical Methods I & II, Advanced Statistical Computing, Epidemiology, Data Science I & II
- Award: AAAI 2022 Security AI Challenger VIII Award (44 out of 3692)

University of Manchester, UK Sep 2019 – Jul 2021

BSc Mathematics and Statistics (GPA: 3.65, with First Class Honours)

- Relevant Coursework: Real Analysis, Statistical Inference, Markov Processes, Probability, Medical Statistics

Shandong University, China Sep 2017 – Jun 2021

BSc Mathematics (GPA: 3.62, top 20%)

- Relevant Coursework: Advanced Algebra I & II, Mathematical Analysis I - III, Geometry
- Award: Third-level Academic Scholarship

RESEARCH EXPERIENCES

Research Assistant, Columbia Neurology, NY Mar 2023 – Present

Supervised by Dr. Annie Lee

- **Title: Multi-region brain transcriptomes uncover two subtypes of aging 3 individuals with differences in Alzheimer risk and the impact of APOEε4**
- Perform the adaptive gene-environment interaction (aGE) test
- Implement mediation analysis among protein, gene expression, infarcts and Alzheimer Disease
- Conduct cluster analysis of Alzheimer's Disease patients, identifying distinct subtypes of aging individuals with differences in Alzheimer's risk and the impact of APOEε4

Undergraduate Thesis, Dept of Mathematics, University of Manchester Sep 2020 – Jun 2021

Supervised by Dr. Kody Law

- **Title: Black-Scholes Pricing Model Data Simulation by Multilevel Monte-Carlo**
- Applied the Euler-Maruyama Method to solve the discretized linear stochastic differential equations on Ito Integral version
- Implemented Monte-Carlo simulation of expectations with strong and weak rates of convergence
- Deduced the properties of an independent estimator by a sequence of Monte-Carlo samples
- Applied Rejection Sampling to Black-Scholes pricing model and improved computational efficacy

Undergraduate Project, School of Mathematics, Shandong University Apr 2019 – Apr 2020

Supervised by Dr. Song Yu

- **Title: Edible Tableware based on Finite Element Analysis**
- Led a team with diverse academic backgrounds and secured full funding (around $900)
- Designed and produced a chopstick-like mold, testing its mechanical characteristics
- Connected and partnered with local restaurants and pubs for testing and review

WORK EXPERIENCES

Biostatistics, Roche Diagnostics (Shanghai) Apr 2022 – Sep 2022

Intern at Medical Scientific Affairs Dept

- Developed statistical methods for analyzing clinical trial data, including the development of novel

approaches to address specific research questions and issues with existing methodologies
- Provided statistical support in preparation of regulatory submissions by developing analytical plans, performing analyses, interpreting results, and summarizing findings into concise reports that are understandable to non-statisticians
- Collaborated with the medical team to develop statistical analysis plans for clinical trials, including sample size calculations and power analyses
- Developed R package for linear mixed effects models for the tumor size over time by Bayesian inference using MCMC

Data Analyst, Sina Weibo (China) Oct 2021 – Apr 2022

Intern at Information System Dept

- Responsible for scraping data, wrangling data, and creating visualization for rankings in the entertainment section, and presented final statistics for several popular TV series, variety shows, and documentary
- Maintained Hive SQL and data warehouse services for business parties to support daily needs
- Analyzed user data and modelled user portraits to provide data support for social media influencers and internal operations

SKILLS

Computer

- R: tidyverse, caret, survival, bioconductor, ggplot2, httr, lme4, gee, etc.
- RShiny, C, MATLAB, SQL, Microsoft Office, AutoCAD

Tests

- Continuous: t, z, ANOVA
- Categorical: chi-squared, Fisher's exact, McNemar's
- Non-parametric: sign, Wilcoxon signed-rank and rank-sum

Modeling

- Linear: linear, logistic, weighted least squares, Poisson, mixed effect
- Model Selection: LASSO, Elastic net, Ridge, PCR, PLS, cross validations
- Non-parametric: decision tree, random forest, boosting, K-NN, cubic splines, local regression, GAM, MARS, LDA, QDA, NB, SVM
- Unsupervised: clustering (K-means, Hierarchical)

Numerical/Optimization

- Data generation, Newton-Raphson, EM, bootstrapping, MCMC

Epidemiology

- Causal Inference: Mediation, Confounder
- Study Design, Effect Modification, Meta-Analysis, Screening

EXTRACURRICULAR ACTIVITIES

Treasurer, Enactus, Shandong University Oct 2018 – Oct 2019

- Tutored students in budget planning for every program
- Responsible for the entire budget arrangement of the organization
- Award: Enactus Annual Outstanding Individual (Top 10%)

Secretary, Association of International Exchange, Shandong University Oct 2017 – Oct 2018

- Assisted in events and activities for the international student exchange
- Trained students to avoid and bridge the gap of culture shock