Zhengwei Song

Tel: (332) 256-6895 | Email: zs2539@cumc.columbia.edu | Website

EDUCATION

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

MS Biostatistics (GPA: 3.96)
- Relevant Coursework: Biostatistical Methods I & II, Advanced Statistical Computing, Epidemiology, Data Science I & II

University of Manchester, 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, Jinan, China   Sep 2017 – Jun 2021

BS Mathematics (GPA: 3.62, top 20%)
- Relevant Coursework: Advanced Algebra I & II, Mathematical Analysis I - III, Geometry

WORK EXPERIENCES

Biostatistics Intern, Medical Scientific Affairs Dept, Roche Diagnostics (Shanghai)   Apr 2022 – Sep 2022
- 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 Intern, Information System Dept, Sina Weibo (Beijing)   Oct 2021 – Apr 2022
- 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

RESEARCH EXPERIENCES

Brain transcriptomes uncover molecular subtypes in Ageing and Alzheimer's Disease,   Mar 2023 – Present
Annie Lee Lab, Dept of Neurology, Columbia University
- Perform the adaptive gene-environment interaction test to find significant genes
- 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

Black-Scholes Pricing Model Data Simulation by Multilevel Monte-Carlo,   Sep 2020 – Jun 2021
Kody Law Lab, Dept of Mathematics, University of Manchester
- 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

Edible Tableware based on Finite Element Analysis,　　　　　　　　　　Apr 2019 – Apr 2020
Song Yu Lab, School of Mathematics, Shandong University
- 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

SKILLS

Computer
- R: tidyverse, caret, survival, bioconductor, ggplot2, httr, lme4, gee, etc.
- RShiny, C, MATLAB, SQL, Unix, 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 / Machine Learning
- 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), PCA

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

Epidemiology
- Mediation Analysis, Confounding Adjustment, Effect Modification
- Study Design, Meta-Analysis, Screening

AWARDS

AAAI 2022 Security AI Challenger VIII Award (44 out of 3692)	Jan 2022
Enactus Annual Outstanding Individual (Top 10%)	Dec 2018
Shandong University Third-level Academic Scholarship, 2017-2018 (Top 30%)	Oct 2018

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