

ZIAN ZHUANG

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Education

University of California, Los Angeles | GPA: 4.0/4.0 **Sep.2022 – Present**
Ph.D. student in Biostatistics *Los Angeles, CA*

University of California, Los Angeles | GPA: 4.0/4.0 **Sep.2020 – Jul.2022**
M.S. in Biostatistics *Los Angeles, CA*

The Hong Kong Polytechnic University | GPA: 3.5/4.0 **Sep.2015 – Aug.2020**
B.B.A. (Hons) in Financial Services (Minor in Applied Mathematics | GPA: 3.6/4.0) *Hong Kong, China*

- Outstanding Academic Achievement Award (Top 3 in department)

Relevant Coursework

Machine Learning, Data Science, Bayesian Inference, Survival Analysis, Power and Sample Size Methods, Inferential Techniques that Use Simulation, Statistical Computing (in Julia), Linear Models, Optimization

Research Interests

- Causal Inference
- Survival Analysis
- High-dimensional Data
- Machine Learning

Research Experience

Supervisor: Dr. Gang Li, *Department of Biostatistics, University of California, Los Angeles*

Topics in Prediction and Causal Inference for Complex Survival Data **Jun.2022 – Present**

- Designed a novel methodology adapting the two-stage least squares (TSLS) approach by incorporating synthetic variables (Leurgans' method) to replace observed outcomes, enabling consistent estimation of causal effects.
- Based on the Accelerated Failure Time (AFT) Instrumental Variable (IV) model framework, we proposed a Synthetic Instrumental method to address high-dimensional exposures and unobserved covariate adjustment in survival analysis with censored Restricted Mean Survival Time (RMST).
- Based on the AFT IV model, we proposed a doubly robust method to address high-dimensional, non-linear confounders in survival analysis with censored RMST.
- Proposed new predictive summary measures based on R square metric for competing risk models with right-censored time-to-event data, demonstrating superior performance compared to the C-index and Brier score.

Supervisor: Dr. Daihai HE, *Department of Applied Mathematics, The Hong Kong Polytechnic University*

Modeling Epidemiological Dynamics: Advanced Methods for Prediction and Analysis **Aug.2020 – Aug.2021**

- Developed an interpretable prediction model using the XGBoost algorithm to identify key predictors for the risk of Antituberculous Drug-Induced Liver Injury (TB-DILI). Built an interactive R Shiny web app that allows users to input clinical data and generate risk predictions.
- Created a SEIR model to simulate inter-city transmission of SARS-CoV-2, accounting for factors like underreported cases and delays in early pandemic stages. Simulated hospital bed occupancy for COVID-19 cases, estimating shortages in inpatient and ICU beds for mild, severe, and critical cases, and proposed a model using social media data to predict bed shortages for non-COVID-19 patients.
- Intensive Care Unit Outcomes Monitoring and Improvement Program: Developed Multivariate Logistic Regression models with Elastic Net for variable selection to estimate patient risk and ICU length of stay, using mortality and long-stayer status as outcomes. Additionally, utilized a Multivariate Lognormal Regression model to predict the length of stay.

Other Experience

Statistician, COPD Program, School of Medicine, UCLA **Jul.2022 – Present**

- Strategically selected statistical models in response to medical professionals' requirements. Visualized, interpreted and communicated complex results to clients for informed decision-making.

Teaching Assistant, Department of Biostatistics, UCLA **Jan.2023 – Present**

- Biostat 202A/B Mathematical Statistics, Biostat 250A Linear Statistical Models (PhD level), Biostat 250C Multivariate Biostatistics (PhD level), Biostat 215 Survival Analysis.

Teaching Assistant, Rollins School of Public Health, Emory **Jul.2024**

- The Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID): Simulation-based Inference for Epidemiological Dynamics (Partially observed Markov process (POMP) model).

Selected Publications (Total Citations: 1745, h-index: 17)

- Zhao Y, **Zhuang Z**, Yang L, et al. Age-period-cohort analysis and projection of cancer mortality in Hong Kong, 1998–2030. *BMJ open*. 2023.
- Zhao S, Cao P, Gao D, **Zhuang Z**, Wang W, Ran J, Wang K, Yang L, Einollahi MR, Lou Y, He D. Modelling COVID-19 outbreak on the Diamond Princess ship using the public surveillance data. *Infectious Disease Modelling*. 2022.
- **Zhuang Z**, Cao P, Zhao S, et al. The shortage of hospital beds for COVID-19 and non-COVID-19 patients during the lockdown of Wuhan, China. *Annals of Translational Medicine*. 2021.
- Zhong Tao, **Zhuang Z**, Dong Xiaoli, et al. Predicting Antituberculosis Drug-Induced Liver Injury Using Interpretable Machine Learning Method: Model Development and Validation Study. *JMIR Medical Informatics*. 2021.
- **Zhuang Z**, Zhao S, Lin Q, et al. Preliminary estimates of the reproduction number of the coronavirus disease (COVID-19) outbreak in Republic of Korea and Italy by 5 March 2020. *International Journal of Infectious Diseases* 2020. [CITED BY 101]
- **Zhuang Z**, Cao P, Zhao S, et al. Estimation of local novel coronavirus (COVID-19) cases in Wuhan, China from off-site reported cases and population flow data from different sources. *Frontiers in Physics* 2020.
- **Zhuang Z**, Zhao S, Lin Q, et al. Preliminary estimation of the novel coronavirus disease (COVID-19) cases in Iran: A modelling analysis based on overseas cases and air travel data. *International Journal of Infectious Diseases* 2020. [CITED BY 128]
- Zhao S, **Zhuang Z**, Ran J, et al. The association between domestic train transportation and novel coronavirus (2019-nCoV) outbreak in China from 2019 to 2020: A data-driven correlational report. *Travel medicine and infectious disease* 2020. [CITED BY 196]
- He D, Zhao S, Lin Q, **Zhuang Z**, Cao P, Wang MH, et al. The relative transmissibility of asymptomatic COVID-19 infections among close contacts. *International Journal of Infectious Diseases*. 2020. [CITED BY 279]
- Yang S, Cao P, Du P, Wu Z, **Zhuang Z**, Yang L, et al. Early estimation of the case fatality rate of COVID-19 in mainland China: a data-driven analysis. *Annals of Translational Medicine*. 2020. [CITED BY 219]

Skills & Interests

Programming Skills: R, Julia, Python, Stan, SAS, LaTeX

Interests: Tennis, Photography