ZIQI LIAO

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EDUCATION

Columbia University Mailman School of Public Health Sep. 2023 - Jun. 2025

Master of Science
Biostatistics GPA: 4.28/4.33
Related courses and grades:
Introduction to Modern Analysis (A+), Statistical Inference (A+), Biostatistical Methods I & II (A+), Topics in Advanced Statistic Computing(A+)

The Chinese University of Hong Kong (Shenzhen) (CUHKSZ) Sep. 2019 - Jun. 2023

Bachelor of Business Administration
Financial Engineering GPA: 3.73/4.0
Related courses and grades:
Basic Machine Learning(A), Introduction to Data Analytics(A), Stochastic Process(A), Optimization in Data Science and Machine Learning(A)

PROFESSIONAL ACTIVITIES

Optimal Subsampling Methods for Single-Index Models Aug. 2025 - Present
Research Project Shenzhen, China
Advisor: Prof. Jiasheng SHI

- Developed communication-efficient subsampling strategies for federated learning across multi-source datasets with high data transfer costs
- Systematically reviewed the evolution of optimal subsampling from linear models to GLMs and single-index models to guide principled design choices
- Extended optimal subsampling methodology from parametric models to semi-parametric single index models while preserving statistical efficiency using an L-optimality perspective
- Led implementation and manuscript preparation; the resulting paper is ready for journal submission

Maximin Effect Estimation with Blockwise Missing Data in Multi-Source Studies Jun. 2024 - Present
Research Project New York, USA
Advisor: Prof. Molei LIU

- Developed robust statistical methods for estimating linear models in target populations by leveraging multiple heterogeneous source datasets with blockwise missing covariates
- Introduced a maximin effect approach to maximize the minimum explained variance across sources, ensuring robust performance under covariate shift conditions

- Proposed doubly robust estimation techniques incorporating density ratio estimation and cross-fitting strategies to handle covariate shift and model misspecification

- Conducted simulations and contribute to theoretical development; this methodological paper is also ready for submission

Gaussian Mixture Models with Missing Values Apr. 2024 - May. 2024

Course Project New York, USA

- Designed and developed a two-layer Expectation-Maximization (EM) algorithm to handle missing data in Gaussian Mixture Models, enhancing the model's robustness and accuracy

- Conducted a rigorous theoretical proof to validate the convergence and performance of the proposed algorithm, ensuring its applicability in practical scenarios

- Implemented extensive simulations to demonstrate the efficacy of the algorithm, benchmarking against standard EM algorithms and showcasing improved handling of missing data

- Theory and simulations demonstrated that the proposed method outperformed other imputation algorithms in terms of accuracy and computational efficiency

Effectiveness Analysis of COVID-19 Quarantine Measures Oct. 2021 - Dec. 2021

Course Project Shenzhen, China

- Built a COVID-19 propagation simulator to conduct “what-if” analyses of quarantine policies

- Enhanced a standard SIR model with additional compartments and parameters to better capture real world transmission dynamics

- Fitted the aforementioned model using heuristic algorithms including genetic algorithms, ant colony algorithms, and simulated annealing algorithms

- Simulated various what-if scenarios using the fitted propagation models and quantifies the effectiveness of quarantine measures in terms of death rates

HONORS AND AWARDS

2021-2022 AP Scholarship, The Chinese University of Hong Kong (Shenzhen) Dec. 2022
2021-2022 Dean's List, The Chinese University of Hong Kong (Shenzhen) Nov. 2022
Meritorious Award, 2022 Mathematical Contest In Modeling May. 2022
2020-2021 Dean's List, The Chinese University of Hong Kong (Shenzhen) Sep. 2021
2019-2020 AP Scholarship, The Chinese University of Hong Kong (Shenzhen) Dec. 2020
2019-2020 Dean's List, The Chinese University of Hong Kong (Shenzhen) Sep. 2020

SKILLS

- **Programming:** Python, R, MATLAB, SPARK, STATA, MYSQL, Java

- **Software:** Gurobi, SPSS, Lingo, Microsoft Office

- **Language:** Native Mandarin speaker, highly proficient in written and oral English