Qitong Zhao

1-8055707586 | 18703681002@163.com, qz2489@columbia.edu
Personal Website: https://zqt0101.github.io/qzhao.github.io/
400 WEST 113TH STREET, Apt 1226, New York, NY 10025

Education

Columbia University New York, NY
M.S. in Applied Mathematics GPA: 3.666/4.000 08/2022-12/2023
University of California, Santa Barbara Santa Barbara, CA
B.S. in Mathematics 09/2018-05/2022

Publication

A Machine Learning Driven Approach on Evaluating Second-hand Housing Price, Heterogeneity Test, and Optimization Path
Submitting in Progress
Co-Author, Guided by Prof. Fan Zhang from Massachusetts Institute of Technology 04/2023-10/2023

- Assisted in examining factors influencing housing prices using a data set of 2799 second-hand units for sale
- Analyzed and compared the importance level of factors using regression trees, random forests and heterogeneity test methods
- Plotted marginal effect diagrams to unveil the nonlinear relationship between factors and price
- Drafted suggestions for government to supervise the supermarket and buyers to avoid overpaying based on the outcome of analysis for factors

Research Experiences

Research on the Developmental Cognitive Neuroscience Mechanism and Intervention of Procrastination
Research Assistant, Advised by Prof. Tingyong Feng from Southwest University 06/2021-09/2021

- **Statistical Analysis on Cognitive Factors of Pupils' Susceptibility to Academic Procrastination and the Developmental Characteristics**
  - Adopted the overall sampling method to collect experimental data and filtered out 4,120 sets of valid data from 5,048 sets of data
  - Performed the independent t-test, correlation analysis, and 4×3 ANOVA to analyze individual differences in students' academic procrastination behavior
  - Applied regression analysis, correlation analysis, and one-way ANOVA to analyze 4 cognitive susceptibility factors that affect primary school students' academic procrastination behavior such as self-control and emotion regulation
- **The Empirical Study of the Mechanism of Cognitive Susceptibility Factors in Decision-making of Academic Procrastination**
  - Assisted in experimental design, data collection and preprocessing
  - Carried out hierarchical regression analysis to explore the predictive effect of self-control ability on procrastination decision-making
  - Partook in establishing an intermediary model to explore the cognitive mechanism of self-control on delayed decision-making
  - Employed the multiple linear regression model to investigate the moderation effect of emotional adjustment difficulties in task utility and procrastination tendency

Research on the Theories and Application of Bayesian Statistics Under the Latent Growth Model
Research Assistant, Advised by Associate Prof. Yuan Liu from Southwest University 07/2020-08/2020

- Used the maximum likelihood estimation and the model selection technique to process missing values based

Qitong Zhao

1-8055707586 | 18703681002@163.com, qz2489@columbia.edu
Personal Website: https://zqt0101.github.io/qzhao.github.io/
400 WEST 113TH STREET, Apt 1226, New York, NY 10025

on Bayesian statistics; compared the effect of parameter estimation of traditional (frequency-based) statistical inference and Bayesian statistics

- Assisted in building the Piecewise Growth Mixture Model based on BSEM to analyze the factors that affect the mood of teenagers based on data from 150 samples at 8 time points

Academic Highlights

A Study on Preconditioning Sparse Matrices with Alternating and Multiplicative Operators 01/2023-05/2023
(https://zqt0101.github.io/qzhao.github.io/preconditioning/)

- Repeated and verified the methods and theories used in one published paper for the Preconditioning Sparse Matrices study (Christoph Klein and Robert Strzodka, 2023)
- Implemented and tested the direct and adaptive construction for general sparse matrices
- Evaluated the computational cost of M_alt-i and verified that it is not suitable as the best preconditioner for solving linear systems
- Combined elliptic and parabolic PDEs on a 2D tensor product grid to understand Alternating Direction Implicit (ADI) method
- Unveiled a new operator splitting method, multiplicative operator splitting, which generalizes the implicit LU method and ADI method and offers much more flexibility in preconditioner construction

Realization of Methods of Solving Linear Algebraic Equations Based on C++ and MATLAB 03/2021-06/2021

- Deduced the elimination process and back-substitution process of the Gaussian elimination method, and analyzed the corresponding cycle times in the program operation
- Programmed to realize the solution of 84-order equations by Gauss Elimination with Maximal Column Pivoting
- Used the Gaussian elimination method and Cholesky decomposition method to solve symmetric positive definite equations with the coefficient matrix of 100 orders respectively
- Compared advantages of the Gaussian elimination method and the Cholesky decomposition method

Internship Experience

Institute of Computing Technology, Chinese Academy of Sciences Remote
Intern 09/2021-10/2021
(https://zqt0101.github.io/qzhao.github.io/optimization-model/)

- Realized various data visualization charts using Python and updated the codes in Python Data Visualization
- Modeled and solved mathematical problems with NumPy in Python, such as linear equations and numerical derivation
- Studied the research status quo of data science such as the application and existing problems of the 0/1 optimization model

Skills & Interests

Computer Skills: Python, R, C++, MATLAB, SPSS
Interests: Mathematics, Fitness, Basketball, Hiking, Cooking, Singing