RENHE WANG

Age: 25 Gender: Male Email: wang_renhe@stu.zuel.edu.cn

EDUCATION

Zhongnan University of Economics and Law, Wuhan, China ***Sep 2021-Jun 2024***

Master of Science in Mathematical Statistics *GPA: 89.71/100*

Coursework: Advanced Probability Theory (95), Statistical Computing and Software (92), Non-parametric Statistics (96), Data Mining and Machine Learning (95), Advanced Mathematical Statistics (92), Asymptotic Statistical Theory (91)

Seminar & Group Meeting

- Intermediate Econometrics Seminar
- Machine Learning Discussion Group
- Algorithm Discussion Group

Thesis: Achieved a score of 94, awarded Outstanding Thesis.

Jiangxi Normal University, Nanchang, China ***Sep 2017-Jun 2021***

Bachelor of Science in Statistics *GPA: 87.06/100*

Bachelor of Economics in Finance (Minor) *GPA: 84.91/100*

Coursework: Mathematical Analysis, Advanced Algebra, Probability Theory and Mathematical Statistics, Stochastic Process, Time Series and Analysis, Macro and Microeconomics, Database

TECHNICAL SKILLS

Programming: Python, R, Matlab, LaTeX

Software&Tools: SPSS, Stata

Language: English (fluent, PTE-67, CET6-521), Mandarin (native)

GRANTS AND FELLOWSHIPS

1. First class Scholarship (Jiangxi Normal University, 2018, 2019&2020, top 5%)
2. Postgraduate recommendation (2021, top 5%)
3. First class Scholarship (Zhongnan University of Economics and Law, 2021)
4. National Scholarship (2023, top 2% of the faculty)
5. Outstanding Graduate (Zhongnan University of Economics and Law, 2024)

AWARDS AND HONORS

1. Second Prize in National Graduate Student Market Survey and Analysis Contest, 2023
2. Second Prize in National Graduate Student Case Competition in Applied Statistics, 2022
3. First Prize in China Undergraduate Mathematical Contest in Modelling (CUMCM), 2020
4. Second Prize in National Undergraduate Market Survey and Analysis Contest, 2020
5. National College Student Mathematics Competition: Second Prize at Provincial Level (Category B), 2019; Third Prize at Provincial Level (Category A), 2020
6. Third Prize in National College Student English Competition, 2019

RESEARCHES

Paper

1. **Renhe Wang**[1], Tong Wang[2], Zhiyong Qian[1], Shulan Hu*[1]. ([1]Zhongnan University of Economics and Law, [2]University of Edinburgh).

   Renhe Wang, Tong Wang, Zhiyong Qian, Shulan Hu, A Bayesian estimation approach of random switching exponential smoothing with application to credit forecast, *Finance Research Letters*, Volume 58, Part C, 2023, 104525, ISSN 1544-6123, https://doi.org/10.1016/j.frl.2023.104525. (Impact Factor: 10.4, JCR Category: Q1, JQL 2022 rating: A)

   Overview: This paper introduces an efficient MCMC sampler for the Random Switching Exponential Smoothing model, enhancing forecast accuracy for time series with changing trends. Validated findings with BIS's quarterly data on non-financial sector credit-to-GDP, showing superior estimation and forecasting results compared to other methods.

2. Shulan Hu[1], Zhiyong Qian[1], **Renhe Wang**[1], Xinyu Wang*[1]. ([1]Zhongnan University of Economics and Law). Learning Performance Analysis of Perceptron Model Based on Markov Sampling, *Acta Mathematicae Applicatae Sinica (Chinese Series)*. Status: Accepted, 2023.

   Overview: This paper investigates the learning performance of the perceptron model based on Markov sampling, which builds upon the traditional framework with independent and identically distributed samples. Initial efforts establish the constraints on the perceptron model's learning performance with uniformly ergodic Markov chain samples and validates its consistent behavior. Furthermore, this study introduces a ueMC-PM algorithm. Numerical investigations undertaken on benchmark repositories reveal that the perceptron model utilizing ueMC samples yields fewer misclassification rates.

3. Shulan Hu*[1], Yusheng Wang[1], Zhiyong Qian[1], **Renhe Wang**[1]. ([1]Zhongnan University of Economics and Law). Learning Performance of Nonlinear Classification Models Based on Markov Sampling, *Chinese Journal of Applied Probability and Statistics*. Status: Under Review, 2024.

   Overview: Nonlinear classification models excel in handling complex problems and are widely used across various fields. This paper explores the learning performance of nonlinear classification models using Markov sampling, an extension of the traditional i.i.d. sample framework. It introduces a ueMC-NL algorithm specifically designed for these models to facilitate the generation of ueMC samples from a finite dataset. Numerical analyses of the random forest and MLP model show that nonlinear classification models utilizing ueMC samples achieve lower misclassification rates compared to those using i.i.d. samples.

4. Xinyu Wang*[1], Yusheng Wang[1], **Renhe Wang**[1], Zhiyong Qian[1]. ([1]Zhongnan University of Economics and Law). A Dynamic Programming Algorithm for MSM Based on Markov Loss Function, *Acta Mathematica Scientia (Chinese Series)*. Status: Under Review, 2024.

   Overview: In this paper, we propose a dynamic programming algorithm based on Markov loss for the state sequence prediction problem of Markov regime switching model. This algorithm aims to improve the accuracy of state sequence prediction by comprehensively considering global and marginal loss. Through numerical simulation experiments and empirical research, the predictive performance of the Viterbi algorithm, marginal loss and Markov loss are evaluated within the MS-AR(1). The derived results exhibit that the algorithm holds considerable superiority in forecasting real state sequences and effectively mitigates state error transition rates.

Conference & Presentation

1. Poster Presenter, ICSA 2024 China Conference, Wuhan, June 28 – 30, 2024.
2. **Renhe Wang**[1], Na Zou[1], Weiwei Wang[1]. ([1]Zhongnan University of Economics and Law). The Impact of Fintech on the Operational Efficiency of Commercial Banks in China. Presented at the Quantitative Finance and Insurance Branch Annual Conference (Chinese), Wuhan, 2023.
   Overview: The Fintech evolution has reshaped commercial banks in China, necessitating a study of its influence on their operational efficiency. Using data from 57 Chinese commercial banks between 2011 and 2020, operational efficiency was gauged via Data Envelopment Analysis (DEA) and further decomposed with the Malmquist index method. A Generalized Moment Estimation model (GMM) assessed Fintech's impact on efficiency. Findings indicated that technological advancements primarily boost bank efficiency. While Fintech aids in enhancing efficiency, its assimilation varies across different bank types.
3. Attended the 12th National Probability and Statistics Conference (Chinese), Qingdao, 2023.

PROJECTS

Research Projects

1. National-Level Project: Risk Events and Stock Market Liquidity and Volatility, 2022
   Responsibilities: Data collection, and report writing.
2. Cross-national Linkage Study on Financial Uncertainty and FinTech, 2023
   Responsibilities: Data collection, Modelling.
3. Research on Data Science Algorithms and Application Cases, 2023
   Responsibilities: Research on Data Science Algorithms, Modelling.
4. Intermediate Econometrics Case Study Project, 2023
   Responsibilities: Developed econometric case studies to elucidate concepts, Engaged in data analysis using econometric models.

Other Projects

1. Porcelain Expo Big Screen BI Construction Project, 2021
   Responsibilities: Data collection and analysis.