Haoqun Cao

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EDUCATION

- **Renmin University of China** - B.S. in Statistics Sep 2020-Jun 2024(expected)
  GPA:3.82/4.0(90.06) rank 1/13, Year 1-3
  Relevant Coursework:
  Mathematical Analysis I(98)II(93) III(91) | Higher Algebra II(95) | Topology(94) | Real Analysis(91)| Mathematical Statistics(91)| Design and Analysis of Algorithms(96)| Optimization(95)| Statistical Computing(94)|Nonparametric Statistics(89)| C Programming(94)|Functional Analysis(84)

PUBLICATION

1. *Tianjun Ke, ***Haoqun Cao**, Zenan Lin, Feng Zhou. **Revisiting Logistic-Softmax Likelihood in Bayesian Meta-Learning for Few-Shot Classification**, *NeurIPS2023 Poster*

MANUSCRIPT

1. **Haoqun Cao**, Zizhuo Meng, Tianjun Ke, Feng Zhou. **Is Score Matching Suitable for Estimating Point Process ?**, *Submitted*
2. Yucong Lin, Liyuan Xu, **Haoqun Cao**, Hongyi Yuan, Junwei Lu. **Diffusion Schrodinger Bridge for Model-Based Reinforcement Learning**

RESEARCH PROJECT

Score Matching as A Way for Statistical Inference for Point Process - Nov 2023-Feb 2024
Supervised by Prof. Feng Zhou @ Renmin University
- Theoretically demonstrate that the existing work on Score Matching(SM) for Temporal Point Process(TPP) fails in most of the scenarios and gives a necessary and sufficient condition regarding when SM is applicable to TPP.
- Propose a weighted Score Matching for parameter estimation when SM fails and prove its consistency.
- Discuss other issues as the non-uniqueness of solutions related to SM methods.

Statistical Modeling for Sleep Trajectory Data - Jun 2023- Present
Supervised by Prof. Annie Qu @ UC Irvine
- The research is about modeling sleep trajectory data collected from pregnant women. We model the trajectory as a discrete-time semi-markov process and derive its multinomial representation.
- We run our model on real data and derive patterns for pregnant women's sleep.

Revisiting Logistic-Softmax Likelihood in Bayesian Meta-Learning for Few-Shot Classification - Jan 2023- Jun 2023
Supervised by Prof. Feng Zhou @ Renmin University
- Theoretically and empirically showed that softmax can be viewed as a particular case of logistic-softmax and logistic-softmax induces a larger family of data distributions than softmax under a Gaussian process multi-classification framework.
- Derived an analytical mean-field approximation for posterior inference through data augmentation.

Diffusion Schrodinger Bridge for Model-Based Reinforcement Learning - Sep 2022-Nov 2023
Supervised by Prof. Junwei Lu @ Harvard University
- The research is about using diffusion model as a transition learner for model-based RL. I implement the main algorithm in PyTorch and conduct most of the numerical experiments.

ACTIVITY EXPERIENCE

Vice-President - Statistical Investigation Association of Renmin University of China(2022-2023)
- We have a group that writes articles and gives lectures on R and Python in our university, and I've led several of these projects

Principal of Strings - Chinese Orchestra of Renmin University of China(2022-2023, 2023-2024)
- Lead other performers of Strings(other Hu instruments, Cello and Base) practicing and rehearsing. Sit next to the conductor when performing.

HONORS & AWARDS

2023 - Academic Excellence Award, Second Class . *Renmin University of China*

2022 - Academic Excellence Award, Third Class . *Renmin University of China*

2022 - Provincial First Prize. *Contemporary Undergraduate Mathematical Contest in Modeling*

2021 - Academic Excellence Award, Second Class . *Renmin University of China*

2021 - Provincial Second Prize. *The Chinese Mathematics Competitions*