Ganghua Wang

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EDUCATIONAL BACKGROUND

Peking University, Beijing, China 09/2015-Present

- Major in Mathematics; Overall GPA: **3.70**/4; Major GPA: **3.81**/4 Rank: **6**/49
- Research Interests: **Statistics Learning**, Network Analysis, Stochastic processes
- Programming: Proficient in Python, MATLAB and R
- English Proficiency: GRE (V157, Q170), TOEFL 100

Main Course and Score

Mathematical Analysis Ⅰ/Ⅱ	98/92	Applied Stochastic Processes	94
Advanced Algebra Ⅰ/Ⅱ	93/93	Mathematical Statistics	95
Probability Theory	92	Statistical Learning	97

Awards and Honors

The Academic Excellence Scholarship of Peking University. (3 times) 2015-2017
The third prize of The Chinese Mathematics Competitions 2016
The third prize of Zehan Jiang Mathematical Contest in Modeling 2016

RESEARCH EXPERIENCE

Project: Component analysis in brain image, Yale University 07/2018-09/2018
Supervised by Prof. Hongyu Zhao

- Extracted components from fMRI dataset using Latent Dirichlet Allocation to explore the intrinsic structure of brain.
- Compared our results with other method like clustering and ICA.
- Studied the relationship between ADHD related neural network and components chosen by our method, confirmed that neural edges selected by us are predictive.

Project: Community detection with co-variate in stochastic block model, PKU 12/2017-06/2018
Supervised by Prof. Jinzhu jia

- Used maximum likelihood and variational approximation to find the most possible classification, with given distribution of attributes.
- Clustered iteratively to approximating the distribution when it is unknown. Testing the goodness of this algorithm by numerical simulation.
- Analyzed the property of MLE and iteration algorithm.

Project: Low rank solution in nonconvex quadric matrix function, PKU 03/2017-12/2017
Supervised by Prof. Zaiwen Wen

- Studied the conditions which is necessary for the global convergence of stochastic gradient descent algorithm.
- Generalized the method in *No Spurious Local Minima in Nonconvex Low Rank Problems: A Unified Geometric Analysis* when constrained on a special manifold, such as unit sphere.
- Exploited the second order derivative of function. Besides, tried to transform constrains to regularization, for the purpose of finding a more efficient algorithm.

SELECTED COURSE PROJECT

Statistical Learning

- Attended the Kaggle competition: Porto Seguro Safe Driver Prediction, ranking top 40% (among 5000 teams).
- Mixed gradient boosting model and neural network model to predict the probability. Large dataset for over one million items.

Numerical Algebra

- Implemented two algorithms to solve a PDE equation. (Multigrid Method with line GS iteration as smoother; Conjugate Gradient Method use multigrid as pre-condition). Compared their performance to Gauss elimination method.
- Replicated all the algorithms in context by myself without using third-part packages in three weeks. The program has high efficiency and accuracy.

COMMUNITY SERVICE AND INTERESTS

- Volunteer as guide for Air&Style snowboard contest in National Stadium (Bird's Nest), Beijing.
- Member of youth bridge team of Beijing.
- Member of badminton team of School of Mathematical Sciences, Peking University.