Yuren Zhou

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EDUCATION

Duke University **North Carolina, U.S.**
M.S. Candidate in Statistics *2018 – 2020 (Expected)*
GPA: 4.0/4.0, PhD research track

Beijing Normal University (BNU) Honors Program **Beijing, China**
B.A. in Economics, B.A. in French (Dual Degree) *2014 – 2018*
B.S. in Mathematics credit requirement fullfilled (No third degree conferred)
GPA: 91.4/100, Rank: 1/40, China National Scholarship
GRE Mathematics Subject Test 930, Percentile: 99%

Beijing No. 8 High School **Beijing, China**
Educational Program for Gifted Young *2010 – 2014*
Program selectivity: 2%, entering university at the age of 13

EXPERIENCES

UC Berkeley, Department of EECS, RISELab *Jun 2019 – Aug 2019*
Visiting student researcher, advised by Prof. Michael I. Jordan and Dr. Chris Junchi Li

Topic: Stochastic Approximation for Online Tensorial Independent Component Analysis

- Studied the non-convex stochastic optimization problem in Tensorial ICA
- Proved an improved finite-sample error bound achieved by two-phase analysis

Topic: Stochastic Scaled-Gradient Descent (SSGD) for Online Generalized Eigenvector Estimation

- Designed SSGD algorithm for constrained non-convex stochastic optimization
- Applied to generalized eigenvector problem, e.g. Canonical Correlation Analysis
- Derived optimal convergence rates of SSGD algorithm and proved asymptotic normality by Polyak average

Duke University, Department of Statistical Science *Feb 2019 – Present*
Research advised by Prof. David Dunson

Topic: Bayesian Neural Networks for Dimension Reduction

- Built a latent variable generative model for non-linear dimension reduction and uncertainty quantification
- Improved identifiability of latent pairwise distances by adding constraints and tying down anchor points

Topic: Isomap based Autoencoders

- Design VAE with Isomap encoder to reduce network complexity and improve reproducibility
- Apply spherelet method for local geodesic distance estimation in Isomap

Topic: Meta Learning for Recommender System

- Learn high-level concepts of items and disentangled representations of users, solve cold start problems
- Use latent embedded meta learning to estimate concept-specific model parameters

Topic: Hierarchical Modeling for Biological Image Classification

- Build hierarchical model with neural network and interpret meta learning from a Bayesian perspective
- Apply to cellular image classification in different tissues

Duke University, Department of Computer Science *Apr 2019 – Nov 2019*
Research advised by Prof. Cynthia Rudin, joint work with group members

Topic: Computational Poetry Generation

- Designed Diverse Trajectory Search (DTS) Algorithm to balance exploration and exploitation
- Solved constrained text generation problem of gpt-2 via methods of POS template, storyline, scoring, etc

Duke University, Department of Statistical Science *Aug 2018 – Jan 2019*

Topic: Differential Inclusions for Modeling Nonsmooth ADMM Variants

- Studied ADMM variants for nonsmooth optimization problems using differential inclusions
- Proved convergence rates of linearized, relaxed and Nesterov's accelerated ADMMs

Duke University, Department of Mathematics *Jun 2017 – May 2018*
Summer research intern and follow-up research

Topic: Online Principal Component Analysis for Subspace Learning

- Utilized Ethier-Kurtz weak convergence and diffusion approximations to study Oja's online PCA algorithm
- Conducted statistical inference for tree-based trajectory averaging method (HiGrad)

PUBLICATIONS

- Stochastic Scaled-Gradient Descent for Online Generalized Eigenvector Estimation, *with Chris Junchi Li, Michael I. Jordan*, submitted to COLT 2020
- Stochastic Approximation for Online Tensorial Independent Component Analysis, *with Chris Junchi Li, Michael I. Jordan*, submitted to COLT 2020
- Computational Poetry Generation: There once was a really bad poet, it was automated but you didn't know it, *with C. Suh, J. Wang, X. Zhang, C. Rudin*, to be submitted
- Differential Inclusions for Modeling Nonsmooth ADMM Variants: A Continuous Limit Theory, *with H. Yuan, C. J. Li, Q. Sun*, short version accepted at ICML 2019, long version preprint at `https://github.com/angeoz/ADMM-master/blob/master/admm_final_arXiv66.pdf`
- Policy Optimization via Stochastic Recursive Gradient Algorithm, *with H. Yuan, C. J. Li, J. Xiong*, NeurIPS 2018 Deep Reinforcement Learning Workshop

SKILLS

- Languages: Chinese, English, French
- Programming: Python, R, Matlab, C, Stata, LaTeX

COURSES AT DUKE

Course	Semester	Instructor	Grade
STA 711 Probability and Measure Theory (PhD)	2019 fall	Robert Wolpert	A+
MATH 631 Advanced Real Analysis (PhD)	2019 fall	Alexander Kiselev	A+
STA 831 Probability and Statistical Models (PhD)	2019 spring	Mike West	A+
STA 732 Statistical Inference (PhD)	2019 spring	Li Ma	A+
STA 671 Machine Learning (PhD)	2019 spring	Cynthia Rudin	A+
STA 601 Bayesian and Modern Statistics	2018 fall	Alexander Volfovsky	A
STA 561 Probabilistic Machine Learning	2019 spring	Sayan Mukherjee	A
STA 523 Statistical Programming	2018 fall	Colin Rundel	A
STA 521 Predictive Modeling	2018 fall	Merlise Clyde	A

SELECTED COURSES AT BNU

Mathematical Analysis, Linear Algebra, Probability and Mathematical Statistics, Statistics, Real Analysis, Complex Analysis, Ordinary Differential Equations, Partial Differential Equations, Stochastic Processes, Financial Mathematics, Econometrics

AWARDS & HONORS

- China National Scholarship (1%) 2016
- Meritorious Winner, Mathematical Contest In Modeling 2017
- 1st Prize, Beijing Normal University Scholarship (5%) 2015 – 2018
- 1st Prize, Individual Scholarship for Outstanding Students in Contests 2016 – 2017
- 1st Prize, Maxdo College Scholarship for Excellent Students (5%) 2015 – 2016