Liyi Zhang

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EDUCATION

Princeton University Jul 2022 – Present
PhD in Computer Science
Advisor: Adji Bousso Dieng

Columbia University Sep 2017 – May 2022
MS in Data Science and BA in Statistics and Applied Mathematics
GPA: 3.9/4.0
Math coursework: Modern Analysis I, Modern Analysis II, Linear Algebra, Ordinary Differential Equations, Analysis and Optimization, Seminar in Applied Mathematics
Statistics coursework: Probability Theory, Multivariate Statistical Inference, Bayesian Statistics, Stochastic Processes, Linear Regression Models, Statistical Computing in R, Probabilistic Graphical Model
Computer Science coursework: Data Structures, Analysis of Algorithms, Neural Networks and Deep Learning, Natural Language Processing, Computer Vision, Optimization for Machine Learning, Mathematics of Deep Learning, Computer Systems for Data Science

EXPERIENCE

Blei Lab May 2021 – May 2022
Graduate Researcher (PI: David M. Blei)
Created a novel algorithm to meld variational inference with Markov chain Monte Carlo, and applied the method to model synthetic data, survey data, and images.

Pe'er Lab Jan 2020 – May 2021
Undergraduate Researcher (PI: Itsik Pe'er)
Created a novel algorithm Variational Combinatorial Sequential Monte Carlo (VCSMC) for phylogenetic inference using Python and TensorFlow and applied the method to 9 DNA datasets.

Department of Statistics, Columbia University May 2020 – Sep 2020
Summer Research Intern (PI: Andrew Gelman)
Implemented stacking algorithm and Bayesian model averaging (BMA) for discrete parameters in phylogenetic inference in R.

QTG Capital Management Jun 2020 – Aug 2019
Quantitative Researcher Intern
Cleaned data, performed feature engineering, and build factor models on financial and commodities futures to develop and back-test trading strategies.

PUBLICATIONS

Transport Score Climbing: Variational Inference Using Forward KL and Adaptive Neural Transport, preprint 2022
Liyi Zhang, Christian A. Naesseth, David M. Blei

Variational Combinatorial Sequential Monte Carlo Methods in Bayesian Phylogenetic Inference, accepted at Uncertainty in Artificial Intelligence 2021
Antonio K. Moretti*, **Liyi Zhang***, Christian A. Naesseth, Hadiah Venner, David M. Blei, Itsik Pe'er

Variational Combinatorial Sequential Monte Carlo in Bayesian Phylogenetic Inference, accepted at Machine Learning in Computational Biology 2020
Antonio K. Moretti, **Liyi Zhang**, Itsik Pe'er,

PROJECTS

Improving Neural Network Robustness with Bayesian Weight Sampling
Implemented several Bayesian neural network (BNN) methods and showed that variational inference BNN outscored benchmarks on image classification performance, robustness against input perturbations, and robustness against model-size pruning.

Stochastic Video Generation with a Recurrent Convolutional Variational Model
Implemented Stochastic Video Generation and conducted experiments of this implementation using video datasets.

ACTIVITIES

Reviewer, **International Conference on Machine Learning** 2022

Reviewer, **Artificial Intelligence and Statistics** 2022

Reviewer, **Machine Learning in Computational Biology** 2021

SKILLS

Skill
Python (+PyTorch, TensorFlow), R, Stan, LaTeX.

Language
Chinese: fluent, Latin: intermediate.