

QINGXUAN JIANG

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OBJECTIVE

To apply for PhD programs starting Fall 2021.

EDUCATION

Cornell University, College of Arts and Sciences
Double Major in Mathematics and Computer Science
Overall GPA: **4.11/4.3** (Dean's List, All Semesters)

Ithaca, NY
Sept. 2017 - May 2021 (expected)

RESEARCH INTERESTS

Convex Optimization, Mathematical Foundations of Machine Learning, Geometric Deep Learning

PUBLICATION AND WORKING PAPER

Conference Paper

- Horace He, Aaron Lou*, **Qingxuan Jiang***, Isay Katsman*, Serge Belongie, and Ser-Nam Lim, Adversarial Example Decomposition, International Conference on Machine Learning Workshop (ICMLW), Long Beach, CA, 2019. [arXiv]
- Aaron Lou*, Isay Katsman*, **Qingxuan Jiang***, Serge Belongie, Ser-Nam Lim, and Christopher De Sa, Differentiating through the Fréchet Mean, International Conference on Machine Learning (ICML), 2020. [arXiv] [Code] [Video]
- Aaron Lou*, Derek Lim*, Isay Katsman*, Leo Huang*, **Qingxuan Jiang**, Ser-Nam Lim, and Christopher De Sa, Neural Manifold Ordinary Differential Equations, to appear at Neural Information Processing Systems (NeurIPS), 2020. [arXiv] [Code]

(* indicates equal contribution)

Journal Paper

- **Qingxuan Jiang**, Tian Lan, Kasso Okoudjou, Robert Strichartz, Shashank Sule, Sreeram Venkat, Xiaoduo Wang, Sobolov Orthogonal Polynomials on the Sierpinski Gasket, submitted to *Journal of Fourier Analysis and Applications*. [arXiv] [Website] [Code]

(In alphabetical order)

RESEARCH EXPERIENCE

Acceleration of Optimization Algorithms via Numerical Analysis Methods *Sep. 2020 - Present*
Supervisor: Adrian Lewis *Department of Operations Research and Information Engineering, Cornell*

- Year-long senior thesis project
- Working on applying the regularized nonlinear acceleration method to speed up optimization algorithms

Local Elasticity and Generalization of Neural Networks *Jul. 2020 - Present*
Supervisor: Weijie Su *Department of Statistics at the Wharton School, University of Pennsylvania*

- Working on empirical evaluation of the relationship between local elasticity and generalization of neural networks

First-order Methods on Large-scale Convex Optimization Problems *Jul. 2019 - Dec. 2019*
Supervisor: James Renegar *Department of Operations Research and Information Engineering, Cornell*

- Implemented subgradient method with restart scheme in MATLAB.
- Applied the above method to speed up algorithms for simple convex feasibility problems with half-spaces.

Manifold Optimization and Geometric Deep Learning *Sep. 2018 - Present*
Supervisor: Christopher De Sa *Undergraduate Artificial Intelligence Research Group, Cornell*

- Developed optimization methods for computation and differentiation of the Fréchet mean
- Integrated these methods into current hyperbolic deep learning architectures, and achieved state-of-the-art result in graph embedding tasks with high hyperbolicity.

PROJECT EXPERIENCE

Analysis and Implementation of Spectral Method *Jun. 2020 - Aug. 2020*
Supervisor: Alex Townsend *Department of Mathematics, Cornell*

- Sponsored by Cornell Research Experience for Undergraduates (REU)
- Developed efficient numerical methods for evaluating exponential integrators, and improved current methods for finding eigenvalues of self-adjoint operators

- Paper under preparation

Orthogonal Polynomials on the Sierpinski Gasket

Jun. 2019 - Jul. 2019

Supervisor: Kasso Okoudjou, Robert Strichartz

Department of Mathematics, Cornell

- Sponsored by Cornell Summer Program for Undergraduate Research (SPUR)
- Developed theory and a Python package for computation of Sobolov and Chebyshev polynomials on SG

Quantum Mechanics-Inspired Acquisition Function in Bayesian Optimization

Jul. 2018 - Aug. 2018

Supervisor: Tingyang Xu

Tencent AI Lab Machine Learning Group

- Developed new acquisition functions for Bayesian Optimization using quantum distribution functions
- Achieved 10% improvement from baseline Gaussian Process methods on certain benchmark functions

CAMPUS INVOLVEMENT

Teaching Assistant

Jan. 2018 - Present

Department of Computer Science, Cornell

- CS 2800: Discrete Structures (SP18, FA18, SP19). Instructor: Michael George
- CS 4820: Introduction to Algorithms (FA19). Instructor: Eva Tardos
- CS 4850: Mathematics Foundations for the Information Age (SP20). Instructor: John Hopcroft
- CS 4780: Introduction to Machine Learning (FA20). Instructor: Thorsten Joachims

Cornell Math Club, Member

Aug. 2017 - Present

Cornell Putnam Team, Member

Dec. 2018 - Present

Cornell Data Science Club, Member

Aug. 2017 - Dec. 2017

- Worked in teams of 3 and achieved top 16% in Zillow's Home Value Prediction Competition

AWARDS & CERTIFICATES

Honorable Mention, International Mathematical Contest in Modeling 2019

Jan. 2019

4th Place, Cornell Mathematical Contest in Modeling

Nov. 2018

Rank 122 out of 4638, William Lowell Putnam Mathematical Competition 2017

Dec. 2017

Tanner Dean's Scholars, Cornell University

May 2017

3rd Place Karl Menger Memorial Award, American Mathematical Society

May 2016

4th Award in Math, Intel International Engineering and Science Fair (ISEF)

May 2016