Edith Jin Zhang

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EDUCATION

PH.D. CANDIDATE, APPLIED MATHEMATICS | Columbia University

2019 - 2025 | New York, NY

M.S. APPLIED MATHEMATICS | Columbia University

2019 - 2021 | New York, NY

B.A. MATHEMATICS | University of Virginia

2015 - 2019 | Charlottesville, VA

RESEARCH INTERESTS

Intersection of probability, analysis, and applied graph theory. Currently working on research relating to variational problems and their gradient dynamics on large networks, and stochastic processes and gradient flows in Wasserstein space.

EXPERIENCE

VISITING RESEARCHER | UCLA MATHEMATICS

Summer 2022 | Los Angeles, CA

Worked with Dr. Mason Porter on network dynamics: PDE descriptions of interacting particle systems on graphs, and optimal control/game theoretic interpretations.

RESEARCH INTERN | IBM-WATSON CORPORATION: MATHEMATICS FOR AI

Spring-Summer 2021 | Yorktown, NY

Internship working on stochastic optimization, describing long-term behavior of stochastic gradient methods using continuum diffusion limits.

UNDERGRADUATE RESEARCH | UNIVERSITY OF VIRGINIA MATHEMATICS

2018 - 2019 | Charlottesville, VA

Worked with Dr. Leonid Petrov on research relating to the asymptotics of random lozenge tilings. Simulated dynamics of random tilings of a hexagon according to the Gelfand-Tetlin scheme. https://lpetrov.cc/simulations/2019-04-30-qvol/.

MATH RESEARCH EXPERIENCE FOR UNDERGRADUATES (REU) | UNIVERSITY OF VIRGINIA

Summer 2018 | Charlottesville, VA

Researched a combinatorial group theory problem on "games on groups" – a game-theoretic approach to studying group structure. Extended results on maximal subgroup structure for certain classes of groups.

BIG DATA SUMMER INSTITUTE | UNIVERSITY OF MICHIGAN BIOSTATISTICS

Summer 2017 | Ann Arbor, MI

Applied machine learning methods to seek relationships in genomic data from NIH LINCS (library of integrated network-based cellular signature). Attended lectures on fundamentals of machine learning and statistics. Poster presentation at University of Michigan Big Data Symposium.

AWARDS

NSF GRADUATE FELLOWSHIP AWARDED 2019

UVA ECHOLS SCHOLAR AWARDED 2016

1ST PLACE, SHENANDOAH MATH MODELING COMPETITION 2018

SKILLS

Proficient in Python, R, Mathematica.

Statistical inference, stochastic optimization, machine learning, data science

Avid self-learner; strong communication and writing skills.

TEACHING

Grader: Numerical Analysis (Fall 2023), Intro to numerical methods (spring 2022), Linear algebra (Fall 2021), Mathematics for Data Science (Spring 2020), Linear algebra (Fall 2020).

Graduate Teaching Assistant: Partial Differential Equations (Fall 2019)

Tutor, University of Virginia Mathematics Department, 2016-2019

PRESENTATIONS, POSTERS, AND TALKS

Two mathematical artworks Exhibition at the Bridges conference on mathematical connections in art, music, architecture, and culture, August, 2024

Higher-Dimension Opinion Dynamics Talk at the Complex Social Systems minisymposium at the Joint Math Meetings, January 2024

Ginzburg–Landau on Large Graph Limits Poster presentation at SIAM-NNP Conference, New Jersey Institute of Technology, Newark, NJ. Oct 2023

VI flow: a statistical physics approach to a statistical algorithm, Data Science Day, Columbia University, New York, NY. April 2022

Methods of numerical and optimization in mathematical modeling, Undergraduate Math Modeling Workshop, Columbia University, New York, NY. Feb 2021

Unveiling mode-connectivity of an optimization landscape, APAM research conference, Columbia University, New York, NY. Mar 2021

Unveiling mode-connectivity to explain successes in topic modeling, Data Science Day, Columbia University, New York, NY. April 2021

PUBLICATIONS

Ginzburg–Landau on Large Graph Limits Preprint, 2023

On Representations of Mean-Field Variational Inference Preprint, 2022

Unveiling Mode Connectivity of the ELBO NeurIps Bayesian Deep Learning workshop, 2021

CONFERENCES AND WORKSHOPS

Bridges conference August 2024

Interacting particle sytems ICERM topical workshop, May 2024

Joint Mathematics Meetings January 2024

SIAM-NNP conference October 2023

Mathematical Research Community (MRC) Complex social systems, June 2023

Network analysis in R Political Networks Conference, June 2023

Bayesian Deep Learning Workshop NeurIps conference, 2021

OTHER

Thomas Jefferson High School Rowing

University of Virginia Women's Rugby

Columbia University Cycling