Iris Zhou

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Education

Stanford University | *B.S. Mathematics* | *Intended M.S. Computer Science* | GPA: 3.99 09/2022 - 06/2026

Relevant Coursework (* indicates M.S. level):

- Theoretical: Real & Complex Analysis, Algebra, Topology, Probability, Theory of Computation.
- Applied: Deep Learning*, Computer Vision*, Cryptography*, Data Structures, Algorithms.

University of Oxford | *Visiting Student, Magdalen College* 04/2024 - 06/2024

- Course in Algebraic Topology (graduate level).

Experience

Stanford Geometric Computing Group | *Undergraduate Researcher* 06/2024 - Present

- Developing improved 3D symmetry detection methods by incorporating group structures and leveraging algebraic approaches into Bayesian optimization algorithms.

Stanford Undergrad Research Institute in Math | *Undergraduate Researcher* 06/2023 - 10/2023

- Complex geometry: analyzed polynomial & holomorphic convexity of shapes in $\mathbb{C}^n$ (spheres, polydisks, ellipsoids). Found polynomial convexity condition for three ellipsoids in $\mathbb{C}^3$.
- Co-authored paper "Polynomial Convexity of Simple Complex Shapes."
- Presented research and updates across multiple campus-wide opportunities and symposiums.

Washington University in Saint Louis | *Student Researcher* 05/2021 - 02/2022

- Applied linear algebra techniques to analyze amino acid sequence alignments.
- Predicted cross-species viral infection propensity, including SARS-CoV-2 infection in humans.
- First-authored paper "Link prediction of viral spike proteins and cell receptors using structural perturbation method." Accepted for publication by *Scientific Reports*.

Projects

A Mean-Field Theory of Training Deep Neural Networks 04/2024 - 06/2024

- Examined depth scales of deep neural networks through a statistical physics framework.
- Theoretically explained which architectural choices the framework generalizes to.
- Empirically verified trainability predictions on CIFAR-10 and MNIST.

Extracurricular Activities

Stanford Undergrad Math Organization | *Content Editor, Cardinality Newspaper* 04/2024 - Present

- Select, review, and edit submissions for mathematical newspaper. Primarily responsible for mathematical content and correctness.

Stanford Math Directed Reading Program | *Undergraduate Mentee* 01/2023 - 06/2023

- Fractal Theory: explored theoretical underpinnings of fractals (e.g. Hausdorff measure & dimension) and applications to iterated function systems, dynamical systems and Julia sets.
- Topological Quantum Field Theories: examined category theoretic formulation of TQFTs as a functor between cobordisms and vector spaces. Presented insights at departmental colloquium.

Achievements

Chess: FIDE Woman Candidate Master & 9-time USA Youth National Team Qualifier.

Mathematics: AIME Qualifier & USAMTS Bronze Medalist.

Programs: Jane Street INSIGHT & WiSE.

Technical Skills

Coding: Python/NumPy, C++, C, Java, Javascript, R.

Other Software: PyTorch, MATLAB, Git, AWS, LaTeX, Mathematica.