

Tian (Sunny) Qin

2 8th St. APT 1, Cambridge, MA 02141
tqin@g.harvard.edu | 609-375-6110
<https://sunnytqin.github.io>

Education

Harvard University, Cambridge, MA

2022 – Present

Ph.D. Student in Computer Science

Princeton University, Princeton, NJ

2015 – 2019

B.A. *cum laude* in Physics, Minor in Statistics and Machine Learning

Publications

1. Distributional Scaling Laws for Emergent Capabilities

Rosie Zhao, Tian Qin*, David Alvarez-Melis, Sham Kakade, Naomi Saphra
Preprint *arXiv:2502.17356v1*

2. A Label is Worth A Thousand Images in Dataset Distillation

Tian Qin*, Zhiwei Deng, David Alvarez-Melis
Proceedings of the *38th Conference on Neural Information Processing Systems (NeurIPS)*, 2024

3. Distinguishing the Knowable from the Unknowable with Language Models

Tian Qin*, Gustaf Ahlritz, Nikhil Vyas, Boaz Barak, Benjamin L. Edelman
Proceedings of the *41st International Conference on Machine Learning (ICML)*, 2024

4. Sometimes I am a Tree: Data Drives Unstable Hierarchical Generalization

Tian Qin*, Naomi Saphra, David Alvarez-Melis
In *Neural Information Processing Systems (NeurIPS) Workshop on Scientific Methods for Understanding Deep Learning and Workshop on Compositional Learning*, 2024

5. Sometimes I am a Tree: Data Drives Unstable Hierarchical Generalization

Tian Qin*, Naomi Saphra, David Alvarez-Melis
In *Neural Information Processing Systems (NeurIPS) Workshop on Scientific Methods for Understanding Deep Learning and Workshop on Compositional Learning*, 2024

6. Distributional Dataset Distillation with Subtask Decomposition

Tian Qin*, Zhiwei Deng, David Alvarez-Melis
In *International Conference on Learning Representations (ICLR) Workshop on Data-Centric Machine Learning Research and Workshop on Data Problems for Foundation Models*, 2024

7. Meta-PDE: Learning to Solve PDEs Quickly Without a Mesh

Tian Qin*, Alex Beatson, Deniz Oktay, Nick McGreivy, Ryan P. Adams
Preprint *arXiv:2211.01604*

Awards

Apple Scholars in AI/ML PhD Fellowship (Data-Centric Machine Learning)

Sept 2025 - Sept 2027

Princeton Allen G. Shenstone Prize in Physics

June 2017, June 2018

Princeton Deborah Jin Memorial Prize in Physics Research

June 2018

United World College Scholars

September 2015

Other Research Experience

Northwestern University Kellogg School of Management

May 2021 – May 2022

Empirical Research Fellow supervised by Prof. Artem Timoshenko

- Improved existing customer product purchase simulations to model diverse customer behaviors observed in empirical marketing research, including customers' brand loyalty (the state dependence effect) and their inventory sensitivities (the stock-piling effect).
- Implemented a Transformer model with trainable positional encoding to predict customer shopping behavior and trained the neural network on the simulation data.

Princeton Physics Department

September 2018 – June 2019

Undergraduate Senior Thesis supervised by Prof. Mariangela Lisanti

- Utilized the unsupervised clustering algorithm DBSCAN to identify dark matter substructures in cosmological simulation results, working with large HDF5 datasets. Analyzed the physical properties of these substructures to gain insight into the self-interacting nature of dark matter particles.
- Applied semi-analytical methods to solve Jeans's Equations for self-interacting dark matter (system of PDEs derived from Poisson's Equation) under spherical and cylindrical symmetry.

Work Experience

IMC Financial Markets Chicago, IL

August 2019 – February 2021

Quantitative Trader

- Conducted extensive analysis of proprietary trading system behavior, collaborating with engineers to enhance technical infrastructure.
- Utilized large trading datasets to identify and research new market opportunities, successfully monetizing these opportunities by prototyping new trading strategies.
- Managed daily operations, execution, and risk for trading portfolios on the equity options desk.

Chicago Trading Company Chicago, IL;

June 2018 – August 2018

Quant Intern

- Implemented various Finite Difference schemes and Least-Square Monte Carlo simulation to price American Options.
- Conducted case studies on the impact of local volatility assumptions on European and American Option pricing.

Personal

In my free time, I enjoy running and climbing, and have recently taken up mountaineering.