

# BO ZHAO

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## RESEARCH INTEREST

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Parameter space symmetry, optimization, deep learning theory

## EDUCATION

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**University of California San Diego**

2021–present

*Ph.D. in Computer Science*

**Georgia Institute of Technology**

2019–2021

*M.S. Computer Science*

**University of Illinois at Urbana-Champaign**

2016–2019

*B.S. Computer Science (with highest honors)*

*B.S. Physics (cum laude and departmental highest distinction)*

## EXPERIENCE

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**NTT Research**

Cambridge, MA

*Research Intern (Mentor: Hidenori Tanaka)*

2024/6–2024/9

- Studied representation and dynamics of emotion in large language models.

**IBM Research**

Cambridge, MA

*AI Intern (Mentor: Nima Dehmamy)*

2022/6–2022/9

- Studied parameter space symmetry and conserved quantities in gradient flow.

## PUBLICATIONS

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### Conference

- [1] Understanding the Difficulty of Solving Cauchy Problems with PINNs.  
Tao Wang, Bo Zhao, Sicun Gao, Rose Yu.  
*The 6th Annual Learning for Dynamics and Control Conference (L4DC)*, 2024.
- [2] Improving Convergence and Generalization Using Parameter Symmetries.  
Bo Zhao, Robert M. Gower, Robin Walters, Rose Yu.  
*International Conference on Learning Representations (ICLR)*, 2024.  
**Oral presentation (top 1.2%).**
- [3] DYffusion: A Dynamics-informed Diffusion Model for Spatiotemporal Forecasting.  
Salva Rühling Cachay, Bo Zhao, Hailey Joren, Rose Yu.  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2023.
- [4] Symmetries, Flat Minima, and the Conserved Quantities of Gradient Flow.  
Bo Zhao\*, Jordan Ganev\*, Robin Walters, Rose Yu, Nima Dehmamy. (\*equal contribution)  
*International Conference on Learning Representations (ICLR)*, 2023.
- [5] Symmetry Teleportation for Accelerated Optimization.  
Bo Zhao, Nima Dehmamy, Robin Walters, Rose Yu.  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

- [6] LIMO: Latent Inceptionism for Targeted Molecule Generation.  
Peter Eckmann, Kunyang Sun, Bo Zhao, Mudong Feng, Michael Gilson, Rose Yu.  
*International Conference on Machine Learning (ICML)*, 2022.
- [7] Concentric Spherical Neural Network for 3D Representation Learning.  
James Fox, Bo Zhao, Beatriz Gonzalez Del Rio, Sivasankaran Rajamanickam, Rampi Ramprasad, Le Song.  
*International Joint Conference on Neural Networks (IJCNN)*, 2022.

## Journal

- [1] Multiple Aging Mechanisms in Ferroelectric Deuterated Potassium Dihydrogen Phosphate.  
Gregory A. Fields, Samuel F. Cieszynski, Bo Zhao, Kidan A. Tadesse, Mohammed A. Sheikh, Eugene V. Colla, and M. B. Weissman.  
*Journal of Applied Physics* 125, 194102, 2019.

## Recent Workshop Abstracts

- [1] Understanding Mode Connectivity via Parameter Space Symmetry.  
Bo Zhao, Nima Dehmamy, Robin Walters, Rose Yu.  
*Unifying Representations in Neural Models Workshop (UniReps)* at NeurIPS 2023.

## AWARDS & HONORS

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**Qualcomm Innovation Fellowship finalist**, 2024

**DeepMind PhD Fellowship**, 2023

**NeurIPS Scholar Award** (travel award), 2022

## TEACHING

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**Teaching Assistant**, CS 4641 Machine Learning, Georgia Tech Fall 2020

**Lead Course Assistant**, CS 225 Data Structures, UIUC Spring 2019

**Course Assistant**, CS 225 Data Structures, UIUC Fall 2017, Spring 2018, Fall 2018

## SERVICE

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### Conference and workshop organization

Student Program and Funding Chair, WiML Workshop at NeurIPS 2024

Workshop Chair Assistant, NeurIPS 2024

### Reviewer

ICML (2022-2024), NeurIPS (2022-2024), ICLR (2024-2025), AISTATS (2024-2025), AAAI (2025)

### Volunteering

Student volunteer at NeurIPS 2023, ICML 2023, NeurIPS 2022 WiML Workshop