

BO ZHAO

Email: bozhao@ucsd.edu ◇ Website: b-zhao.github.io

RESEARCH INTEREST

Parameter space symmetry, optimization, deep learning theory

EDUCATION

University of California San Diego

2021–present

Ph.D. in Computer Science

· Advisor: Rose Yu

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

NTT Research

Cambridge, MA

Research Intern (Mentor: Hidenori Tanaka)

2024/6–2024/9

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

IBM

Cambridge, MA

AI Intern (Mentor: Nima Dehmamy)

2022/6–2022/9

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

AWARDS & HONORS

NVIDIA Graduate Fellowship finalist

2025

Qualcomm Innovation Fellowship finalist

2024

DeepMind PhD Fellowship

2023

PUBLICATIONS

Preprints

- [1] Emergence of Hierarchical Emotion Representations in Large Language Models
Bo Zhao*, Maya Okawa*, Eric J. Bigelow, Rose Yu, Tomer Ullman, Hidenori Tanaka.
In submission. Workshop version to appear at SciForDL 2024.
- [2] Finding Symmetry in Neural Network Parameter Spaces.
Bo Zhao, Nima Dehmamy, Robin Walters, Rose Yu.
In submission. Workshop version to appear at UniReps 2024.
- [3] Understanding Mode Connectivity via Parameter Space Symmetry.
Bo Zhao, Nima Dehmamy, Robin Walters, Rose Yu.
In submission. Workshop version appeared at UniReps 2023.

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*, Iordan 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.

TEACHING

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

Workshop organizer

Workshop on Neural Network Weights as a New Data Modality at ICLR 2025
Women in Machine Learning (WiML) Workshop at NeurIPS 2024

Reviewer

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