

# BO ZHAO

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

## RESEARCH INTEREST

---

Deep learning, optimization, parameter space symmetry

## 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

---

**IBM**

June - September 2022

AI Intern (Mentor: Nima Dehmamy)

Cambridge, MA

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

## PUBLICATIONS

---

### Preprints

- [1] **Bo Zhao**, Robert M. Gower, Robin Walters, Rose Yu. Improving Convergence and Generalization Using Parameter Symmetries. *In submission. arXiv:2305.13404*, 2023.
- [2] Salva Rühling Cachay, **Bo Zhao**, Hailey James, Rose Yu. DYffusion: A Dynamics-informed Diffusion Model for Spatiotemporal Forecasting. *In submission*, 2023.

### Conference & Journal

- [1] **Bo Zhao\***, Iordan Ganev\*, Robin Walters, Rose Yu, Nima Dehmamy. (\*equal contribution) Symmetries, Flat Minima, and the Conserved Quantities of Gradient Flow. *International Conference on Learning Representations (ICLR)*, 2023.
- [2] **Bo Zhao**, Nima Dehmamy, Robin Walters, Rose Yu. Symmetry Teleportation for Accelerated Optimization. *Advances in Neural Information Processing Systems (NeurIPS)*, 2022.
- [3] Peter Eckmann, Kunyang Sun, **Bo Zhao**, Mudong Feng, Michael Gilson, Rose Yu. LIMO: Latent Inceptionism for Targeted Molecule Generation. *International Conference on Machine Learning (ICML)*, 2022.
- [4] James Fox, **Bo Zhao**, Beatriz Gonzalez Del Rio, Sivasankaran Rajamanickam, Rampi Ramprasad, Le Song. Concentric Spherical Neural Network for 3D Representation Learning. *International Joint Conference on Neural Networks (IJCNN)*, 2022.

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

### Workshop Abstracts

- [1] **Bo Zhao**, Iordan Ganev, Robin Walters, Rose Yu, Nima Dehmamy. Charting Flat Minima Using the Conserved Quantities of Gradient Flow. *Symmetry and Geometry in Neural Representations Workshop (NeurReps)* at NeurIPS 2022.
- [2] **Bo Zhao**, Iordan Ganev, Robin Walters, Rose Yu, Nima Dehmamy. A Noether's Theorem for Gradient Flow: Continuous Symmetries of the Architecture and Conserved Quantities of Gradient Flow. *Women in Machine Learning workshop (WiML)* at NeurIPS 2022.
- [3] **Bo Zhao**, Nima Dehmamy, Robin Walters, Rose Yu. Symmetry Teleportation for Accelerated Optimization. **Contributed talk** at *Conference on the Mathematical Theory of Deep Neural Networks (DeepMath)*, 2022.

### TEACHING

---

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

Fall 2020

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

Fall 2017 - Spring 2019

### INVITED TALKS

---

Boston Computation Club, July 2023

AI TIME, May 2023

### SERVICE

---

**Reviewer** ICML (2022, 2023), NeurIPS (2022, 2023)