Leo Zhang

DPhil Student in Statistics, University of Oxford

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Research Interests

My research currently focusses on the mathematical understanding of deep generative models, and their application to scientific problems. In particular, I have worked on constructing scalable algorithms, which take inspiration from ideas in geometry and category theory, for tackling biochemical problems such as de novo molecular generation.

Education

Department of Statistics, University of Oxford — Oxford, UK
DPhil in Statistical Machine Learning — 2023 - *(current)*
- Part of the Statistics and Machine Learning (StatML) CDT.
- Advisors: Dr Rob Cornish, Dr Saifuddin Syed, Prof. Yee Whye Teh.

Department of Statistics, University of Oxford — Oxford, UK
MSc in Statistical Science, Distinction — 2022 - 2023
- UK Grade: 84%, US GPA: 4.00/4.00.

Department of Mathematics, Imperial College London — London, UK
BSc in Mathematics, 1st Class — 2019 - 2022
- UK Grade: 84%, US GPA: 4.00/4.00.

Publications

1. Generalised Parallel Tempering: Flexible Replica Exchange via Flows and Diffusions
Leo Zhang, Peter Potaptchik, Arnaud Doucet, Hai-Dang Dau, Saifuddin Syed
Arvix Preprint, 2025

2. SymDiff: Equivariant Diffusion via Stochastic Symmetrisation
Leo Zhang, Kianoosh Ashouritaklimi, Yee Whye Teh, Rob Cornish
The Thirteenth International Conference on Learning Representations,, 2025

3. Metric Flow Matching for Smooth Interpolations on the Data Manifold
Kacper Kapusniak, Peter Potaptchik, Teodora Reu, **Leo Zhang**, Alexander Tong, Michael Bronstein, Avishek Joey Bose, Francesco Di Giovanni
Advances in Neural Information Processing Systems, 2024

Internships

Multiwave Technologies AG. | Remote — 06/2021 - 09/2021
- Developed ML models for predicting signals generated by photon interactions in PET scanners.

Research Experience

Durham University UROP | Durham, UK — 06/2022 - 08/2022
- Developed a dimensionality reduction algorithm which identifies the equivalence relations preserving the original topology.
- Supervised by Dr Ximena Fernández and Prof. Jeffrey Giansiracusa.

Imperial College London UROP | Remote — 06/2020 - 09/2020
- Developed ML models for classifying videos of tennis shots.
- Supervised by Prof. William Knottenbelt.

Awards and Honors

- **Dean's List**, Top 10% of cohort in each year at Imperial College London. 2019 - 2022
- **LMS UROP Bursary**, Awarded by the London Mathematical Society. 2022
- **Winton Capital Prize**, Best second-year group project in pure mathematics. 2021

Skills

Programming: Python.
Machine Learning: PyTorch, JAX.