

JIAJUN HE

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EDUCATION

University of Cambridge <i>Doctor of Philosophy in Advanced Machine Learning</i> Supervisor: Prof. José Miguel Hernández-Lobato ◦ Research Interest: probabilistic models; Monte Carlo methods; generative models; data and model compression.	UK Oct 2024-
University of Cambridge <i>Master of Philosophy in Machine Learning and Machine Intelligence</i> ◦ Graduate with <i>Distinction</i> (1st of the cohort) ◦ Average Grade: 84% (distinction condition: $\geq 75\%$) ◦ Thesis: Data Compression with Variational Implicit Neural Representations (graded 83.5%)	UK 2022 - 2023
University of Copenhagen <i>Master of Science in Bioinformatics</i> ◦ Average Grade: 11.875/12 ◦ Award: Danish Governmental Scholarship for Academic Excellence ◦ Thesis: Deep Ancestral Protein Sequence Reconstruction (graded 12/12)	Denmark 2020 - 2022
Tsinghua University <i>Bachelor of Science in Biological Science</i> ◦ Thesis: Cancer Subtype Identification by Somatic Mutations (graded 92%)	China 2016 - 2020

EXPERIENCES

University of Cambridge <i>Research Assistant in Machine Learning</i> Supervisor: Prof. José Miguel Hernández-Lobato ◦ Data and model compression; relative entropy coding; channel simulation. ◦ Probabilistic generative models; diffusion models.	UK Nov 2023 - Oct 2024
Stevens Institute of Technology <i>Research Intern</i> Supervisor: Jordan Suchow ◦ Statistical modeling of social faces evaluation.	USA July 2019 - Aug 2019

SELECTED PUBLICATIONS

IN SUBMISSION AND PREPRINT:

- [1] **J. He**, J. M. Hernández-Lobato, Y. Du, F. Vargas. RNE: A Plug-and-play Framework for Diffusion Density Estimation and Inference-time Control. *ArXiv*.
- [2] L. Zhang[†], P. Potapchik[†], **J. He**[†], Y. Du, A. Doucet, F. Vargas, H. Dau, S. Syed. Accelerated Parallel Tempering via Neural Transports. Submitted to *NeurIPS*.
- [3] **J. He**[†], Y. Du[†], F. Vargas, Y. Wang, C. P. Gomes, J. M. Hernández-Lobato, E. Vanden-Eijnden. FEAT: Free energy Estimators with Adaptive Transport. Submitted to *NeurIPS*.

CONFERENCE:

- [4] S. Rissanen[†], R. OuYang[†], **J. He**, W. Chen, M. Heinonen, A. Solin, J. M. Hernández-Lobato. Progressive Tempering Sampler with Diffusion. In *ICML 2025*.
- [5] **J. He**[†], W. Chen[†], M. Zhang[†], B. David, J. M. Hernández-Lobato. Training Neural Samplers with Reverse Diffusive KL Divergence. In *AISTATS 2025*.
- [6] **J. He**, G. Flamich, J. M. Hernández-Lobato. Accelerating Relative Entropy Coding with Space Partitioning. In *NeurIPS 2024*.
- [7] **J. He**[†], G. Flamich[†], Z. Guo, J. M. Hernández-Lobato. RECOMBINER: Robust and Enhanced Compression with Bayesian Implicit Neural Representations. In *ICLR 2024*.
- [8] Z. Guo[†], G. Flamich[†], **J. He**, Z. Chen, J. M. Hernández-Lobato. Compression with Bayesian Implicit Neural Representations. In *NeurIPS 2023 spotlight*.

WORKSHOP:

- [9] **J. He**[†], Y. Du[†], F. Vargas, D. Zhang, S. Padhy, R. OuYang, C. P. Gomes, J. M. Hernández-Lobato. No Trick, No Treat: Pursuits and Challenges Towards Simulation-free Training of Neural Samplers. In *ICLR 2025 Workshop on Frontiers in Probabilistic Inference: Sampling Meets Learning*.
- [10] M. Zhang[†], **J. He**[†], W. Chen[†], Z. Ou, J. M. Hernández-Lobato, Bernhard Schölkopf, David Barber. Towards Training One-Step Diffusion Models Without Distillation. In *ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy*.
- [11] **J. He**, G. Flamich, J. M. Hernández-Lobato. Getting Free Bits Back from Rotational Symmetries in LLMs. In *NeurIPS 2024 Workshop on Machine Learning and Compression* oral.

([†]) denotes equal contribution. For a complete list of publications, please refer to my Google Scholar profile.

AWARDS AND ACHIEVEMENTS

Harding Distinguished Postgraduate Scholarship, University of Cambridge <i>PhD scholarship, valued at about 61,000 GBP per annum</i>	2024-2027
Distinction in MPhil Degree, University of Cambridge <i>Ranked 1st in MPhil in Machine Learning and Machine Intelligence</i>	2023
Postgraduate Tutors Prize, Fitzwilliam College, University of Cambridge <i>Award for Distinction in MPhil in Machine Learning and Machine Intelligence</i>	2023
Danish Governmental Scholarship for Academic Excellence <i>Award for academic excellence, valued at 215,105 DKK</i>	2021

TEACHING AND SUPERVISION

MPhil Thesis Supervision			University of Cambridge
Fengzhe Zhang	2024	<i>Efficient Sampling of Molecular Energy Functions Using Consistency Models</i>	
MEng (4th year) Project Supervision			University of Cambridge
Luran Wang	2024-2025	<i>Towards better Neural Samplers for Boltzmann Distribution</i>	

ACADEMIC SERVICES

Selected Reviewing: NeurIPS 2024-2025, ICLR 2025, ICML 2025, AISTATS 2025, DCC 2025

EXTRACURRICULAR

Contracted Contributor for Creativity Photos, Visual China Group	since 2017
Contracted Contributor for Creativity Photos, Getty Images	since 2017
Landscape Group Leader, Photography Team of the Student Art Troupe, Tsinghua University	2018 - 2019
Vice Captain, Photography Team of the Student Art Troupe, Tsinghua University	2017 - 2018