Xingjian Bai

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[Github] [Scholar]
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Education

Master of Mathematics and Computer Science, University of Oxford   Oct 2023 – Present

Bachelor of Arts, University of Oxford   Oct 2020 – July 2023
Mathematics and Computer Science

- First Year: Distinction with **Gibbs Prize** (the best performance in CS)
- Second & Third Year: First Class

Research Experience

Visual Geometry Group (VGG), Oxford   Oct 2023 - Present
Student Researcher   *Supervisor: Prof. Christian Rupprecht*
Topics: Develop diffusion models parametrized by fixed-point dynamic systems, which enable dynamic allocation of computational resources across denoising timesteps.

Stanford Vision & Learning Lab (SVL)   Jul 2023 - Present
Undergraduate Visiting Research Intern   *Supervisor: Prof. Jiajun Wu*
Topics: Enhance the compositionality of diffusion models with neural-symbolic control; distill the understanding of abstract relations from Large Language Models.

Algorithms and Complexity Theory Group, Oxford   Mar 2023 - Aug 2023
Student Researcher   *Supervisor: Prof. Christian Coester*
Topics: Innovated sorting algorithms leveraging erroneous predictions from machine learning models; obtained optimal, sub-$O(n \log n)$ comparison complexity with good predictions.

Mathematics Institute, Oxford   Jul 2022 - Apr 2023
Summer Research Intern   *Supervisor: Prof. Jan Obló́j*
Topics: Proposed adversarial attack algorithms grounded in distributional robust optimization (DRO) sensitivity analysis; advanced the understanding of robustness of neural networks.

AI Safety Research Lab, Oxford   Nov 2022 - Mar 2023
Student Researcher   *Mentor: Joar Skalse*
Topics: Explored reward hacking due to over-optimization in Reinforcement Learning settings; developed a geometric explanation and an early-stopping algorithm to prevent it in training.

Publications

Xingjian Bai, Christian Coester "Sorting with Predictions." *Conference on Neural Information Processing Systems (**NeurIPS**)*, 2023. [arXiv]

Xingjian Bai, Guangyi He, Yifan Jiang, Jan Obloj "Wasserstein Distributional Robustness of Neural Networks." *Conference on Neural Information Processing Systems (**NeurIPS**)*, 2023. [arXiv]

Xingjian Bai, Luke Melas-Kyriazi "Fixed Point Diffusion Models." *Under review.*

Jacek Karwowski, Oliver Hayman, **Xingjian Bai**, Klaus Kiendlhofer, Charlie Griffin, Joar Skalse "Goodhart's Law in reinforcement learning." *ICLR under review, average score 6.25x.* [arXiv] [Post]

Xingjian Bai, Ruining Ma, Yulong Lou "Containing Invasive Species via Cellular Automaton and AI." *Journal of Undergraduate Mathematics and Its Applications (UMAP)*, 2021.

Hannah Rose Kirk, Yennie Jun, Paulius Rauba, Gal Wachtel, Ruining Li, **Xingjian Bai**, Noah Broestl, Martin Doff-Sotta, Aleksandar Shtedritski, Yuki M. Asano "Memes in the Wild: Assessing the Generalizability of the Hateful Memes Challenge Dataset." *Proceedings of the 5th Workshop on Online Abuse and Harms*, 2021. [arXiv]

Awards & Honors

NeurIPS Scholar Award	2023
Conference on Neural Information Processing Systems (NeurIPS)	
Regional Gold Medalist, going to ICPC World Final	2023
International Collegiate Programming Contest (ICPC)	
Outstanding Winner & American Maths Society Best Paper (1 / 10053)	2021
37th Mathematical Contest in Modeling	
"*Hack the Hackers' Hack*" award, best out of 66 teams	2020
Oxford Hackathon	
Full Score	2019
USA Computing Olympiad Open	
First place among the national team	2018
Canadian Computing Olympiad	
Silver Medalist	2018
Chinese National Olympiad in Informatics	
First place in Beijing, 395 / 400 points	2016
Chinese National Olympiad in Informatics Provincial - middle school division	

Other Experience

Oxford Student Ambassador	Present
Mathematics Institute & Computer Science department	
Participate in outreach events; teach algorithms to students from underdeveloped areas.	
Practicals Demonstrator, Machine Learning, Oxford	Present
Computer Science department	
Reviewer	2023
Workshop on Self-Supervised Learning - Theory and Practice, NeurIPS	
Teaching Assistant, Compilers, Oxford	2022
Computer Science department	
Reviewer	2022
Workshop on Online Abuse and Harms, NAACL	

Skills & Interests

Programming Languages: Proficient in C++, Python; experienced in Julia, Java, Scala, Haskell.
Hobbies: Marathon PB: 4 h 7min; 10 KM PB: 42 min; Tennis; the game of Go (3-Dan).