Xingjian Bai

St John's College,   [Github] [Scholar]
Oxfords, UK, OX1 3JP   xingjianbai0914@gmail.com

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 Obłój*
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." *CVPR under review. arXiv in December.*

Jacek Karwowski, Oliver Hayman, **Xingjian Bai**, Klaus Kiendlhofer, Charlie Griffin, Joar Skalse "Goodhart's Law in reinforcement learning." *ICLR under review.* [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 *Conference on Neural Information Processing Systems (NeurIPS)*	2023
Regional Gold Medalist, going to ICPC World Final *International Collegiate Programming Contest (ICPC)*	2023
Outstanding Winner & American Maths Society Best Paper (1 / 10053) *37th Mathematical Contest in Modeling*	2021
"*Hack the Hackers' Hack*" award, best out of 66 teams *Oxford Hackathon*	2020
Full Score *USA Computing Olympiad Open*	2019
First place among the national team *Canadian Computing Olympiad*	2018
Silver Medalist *Chinese National Olympiad in Informatics*	2018
First place in Beijing, 395 / 400 points *Chinese National Olympiad in Informatics Provincial - middle school division*	2016

Other Experience

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

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).