

# Xingjian Bai

St John's College,  
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## Education

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**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

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**Visual Geometry Group (VGG), Oxford** Oct 2023 - Present

*Student Researcher*

*Supervisor: Prof. Christian Rupprecht, Luke Melas-Kyriazi*

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 - Sep 2023

*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 Oblój*

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

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Xingjian Bai, Christian Coester “Sorting with Predictions.” *NeurIPS 2023*. [arXiv]

Xingjian Bai, Guangyi He, Yifan Jiang, Jan Obloj “Wasserstein Distributional Robustness of Neural Networks.” *NeurIPS 2023*. [arXiv]

Xingjian Bai, Luke Melas-Kyriazi “Fixed Point Diffusion Models.” *CVPR under review*. [arXiv]

Jacek Karwowski, Oliver Hayman, Xingjian Bai, Klaus Kiendlhofer, Charlie Griffin, Joar Skalse “Goodhart’s Law in reinforcement learning.” *ICLR 2024*. [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 (WOAH)*, 2021. [[arXiv](#)]

### *Awards & Honors*

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

### *Other Experience*

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

### *Skills & Interests*

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**Programming Languages:** Proficient in C++, Python; experienced in Julia, Java, Scala, Haskell.  
**Hobbies:** Marathon (4h 7min), tennis, table tennis, the game of Go (3 Dan).