Xingjian Bai

St John's college, St Giles Street
Oxfordshire, UK, OX1 3JP

[Github] [Scholar]
xingjianbai0914@gmail.com

Education

University of Oxford Oct 2020 – Present
Mathematics and Computer Science

- First Year: Distinction with Gibbs Prize (best performance in CS)
- Second & Third Year: First Class
- Selected courses: Combinatorial Optimisation; Theory of Deep Learning; Stochastic Analysis.

Publications

Karwowski, J., Hayman, O., **Bai, X.**, Kiendlhofer, K., Griffin, C., Skalse, J. "Goodhart's Law in reinforcement learning." *Under review, arxiv:2310.09144.*

Bai, X., Coester, C. "Sorting with Predictions." *Conference on Neural Information Processing Systems (**NeurIPS**)*, 2023.

Bai, X., He, G., Jiang, Y., Obloj, J. "Wasserstein Distributional Robustness of Neural Networks." *Conference on Neural Information Processing Systems (**NeurIPS**), 2023.*

Bai, X., Ma, R., Lou, Y. "Containing Invasive Species via Cellular Automaton and AI." *Journal of Undergraduate Mathematics and Its Applications (**UMAP**)*, **AMS Best Paper award**, 2021.

Kirk, H. R., Jun, Y., Rauba, P., Wachtel, G., Li, R., **Bai, X.**, Broestl, N., Doff-Sotta, M., Shtedritski, A., Asano, Y. M. "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.

Research Experience

Stanford Vision & Learning Lab (SVL) Jul 2023 - Present
Summer Research Intern *Supervisor: Prof. Jiajun Wu*
Topics: Enhance the compositionality of diffusion models with a neural-symbolic approach. Distill the understand of abstract relations from Large Language Models to enhance generation.

Visual Geometry Group (VGG), Oxford Feb 2023 - Present
Student Researcher *Supervisor: Prof. Christian Rupprecht*
Topics: Develop a novel denoising framework for diffusion models using fixed-point differential equations, enabling dynamic allocation of computational resources across timesteps.

Theoretical CS Group, Oxford Mar 2023 - Aug 2023
Student Researcher *Supervisor: Prof. Christian Coester*
Topics: Innovated sorting algorithms utilizing predictions possibly from machine learning models; obtained optimal sub-$O(n \log n)$ comparison complexity with sufficiently accurate predictors.

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.

Oxford AI Safety Research Lab, Oxford Jul 2022 - Apr 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.

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 (top out of 10053 papers) 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

Global Bronze Medalist 2019
the S.-T. Yau High School Science Award

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

Teaching Assistant, Compilers, Oxford 2022
Computer Science department

Workshop Reviewer 2022
NAACL, Workshop on Online Abuse and Harms (WOAH)

Machine Learning for Alignment Bootcamp (MLAB) 2022
Redwood Research, Berkeley
Intense 3-week program focusing on ML interpretability and alignment.

Summer Research Intern 2021
Intelligent Computing team, Megvii Research Institute
Participated in FaceBook Image Retrieval challenge; built vision transformer pipelines.

Project Lead 2021
Oxford Strategy Group – Digital
Evaluated the robustness of the AI systems in JOOX, a music platform.

Skills & Interests

Programming Languages: Proficient in C++, Python; experienced in Julia, Java, Scala, Haskell.
Interested Games: Codeforces; the game of Go (3-Dan).
Hobbies: tennis, jogging, swimming, table tennis, ultimate frisbee.