

XIANGYU ZHAO

48 Haydn Tower, 50 Wandsworth Road, London SW8 2FN

Personal Website: <https://victorzxy.github.io/>

Email: x.zhao22@imperial.ac.uk ♦ GitHub: VictorZXY

EDUCATION

PhD in Electrical and Electronic Engineering

January 2023 – Present

Imperial College London, United Kingdom

Research topic: Representation Learning on Higher-Order Graphs

Supervisor: Dr Yiren Zhao

Award: Electrical and Electronic Engineering PhD Scholarship

Expected graduation: January 2027

BA & MEng (Hons) in Computer Science

October 2018 – June 2022

Trinity College, University of Cambridge, United Kingdom

BA final year result: 2.i (Overall: 70.5%; Units: 86%; Dissertation: 81%)

MEng result: Distinction (Overall: 81.2%; Modules: 79.7%; Dissertation: 83%; Ranking: 7/25)

Awards: Senior Scholarship; Exam Prize 2022

WORK EXPERIENCE

Department of Computer Science and Technology, University of Cambridge

January 2023 – Present

Visitor

Cambridge, United Kingdom

- Undertake research work for the PhD in EEE at Imperial College London, co-supervised by Prof Pietro Liò;
- Roles: Teaching Assistant (Algorithms 1 2022-23), Supervisor (Introduction to Probability 2022-23, Foundations of Computer Science 2023-24).

Department of Computer Science and Technology, University of Cambridge

June – September 2022

Undergraduate Research Opportunities Programme (UROP) – Research Intern

Cambridge, United Kingdom

- Research Project: Long and Short-Range Attentions for Complex hypergraph Data;
- Supervisors: Dr Yiren Zhao, Prof Robert Mullins.

ByteDance

June – September 2021

Algorithm Engineer Intern

Beijing, China

- Trained a model based on causal forest and double ML for TikTok Lite's user growth campaign;
- Increased per-user successful invitation count by 43.9% while decreasing its cost by 56.1%.

PUBLICATIONS

- Xiandong Zou, **Xiangyu Zhao**, Pietro Liò, and Yiren Zhao (2023). Will More Expressive Graph Neural Networks do Better on Generative Tasks? *arXiv preprint arXiv:2308.11978*.
- **Xiangyu Zhao**, Zehui Li, Mingzhu Shen, Guy-Bart Stan, Pietro Liò, and Yiren Zhao (2023). Hybrid Graph: A Unified Graph Representation with Datasets and Benchmarks for Complex Graphs. *arXiv preprint arXiv:2306.05108*.
- **Xiangyu Zhao**, Hannes Stärk, Dominique Beaini, Yiren Zhao, and Pietro Liò (2023). Task-Agnostic Graph Neural Network Evaluation via Adversarial Collaboration. *11th International Conference on Learning Representations (ICLR 2023) Machine Learning for Drug Discovery (MLDD) Workshop*.
- **Xiangyu Zhao** and Sean B. Holden (2022). Towards a Competitive 3-Player Mahjong AI using Deep Reinforcement Learning. In *2022 IEEE Conference on Games (CoG)*.
- **Xiangyu Zhao** and Sean B. Holden (2022). Building a 3-Player Mahjong AI using Deep Reinforcement Learning. *arXiv preprint arXiv:2202.12847*.

PROJECT EXPERIENCE

Will More Expressive Graph Neural Networks do Better on Generative Tasks?

2023

- Improved GNN-based graph generative models with more advanced GNNs;
- Showed that GNN expressiveness in graph prediction does not correlate to its performance in graph generation.
- Source code: <https://github.com/Yqcca/graph-generative-models>
- Publication: <https://arxiv.org/abs/2308.11978>

Hybrid Graph: A Unified Graph Representation with Datasets and Benchmarks for Complex Graphs

2023

- Introduced the concept of hybrid graphs, a unified definition for higher-order graphs;
- Developed a collection of hybrid graph datasets with an extensible evaluation framework.
- Project homepage: <https://zehui127.github.io/hybrid-graph-benchmark/>
- Publication: <https://arxiv.org/abs/2306.05108>

Task-Agnostic Graph Neural Network Evaluation via Adversarial Collaboration

2022

- Developed a conceptually novel, principled, task-agnostic, and stable framework for evaluating GNNs through contrastive self-supervision, without needing handcrafted augmentations;
- Distinguish GNNs of different expressiveness by having them directly compete against each other on unlabelled graphs, and ensures that more expressive GNNs can win by producing more informative graph embeddings.
- Paper published at the ICLR 2023 Machine Learning for Drug Discovery (MLDD) Workshop.
- Source code: <https://github.com/VictorZXY/GraphAC>
- Publication: <https://arxiv.org/abs/2301.11517>

Deep Reinforcement Learning for Mahjong

2021

- Designed an informative and compact data structure for encoding observable Mahjong states, built an AI for Mahjong by pre-training CNN models for each action, and improved the major action's model with self-play RL;
- Models achieved near state-of-the-art level, and RL significantly improved the agent's win rate from SL;
- Paper published at the 2022 IEEE Conference on Games (CoG).
- Source code: <https://github.com/VictorZXY/meowjong>
- Publication: <https://ieeexplore.ieee.org/document/9893576>

SKILLS

Languages	Chinese (Native), English (Fluent, IELTS Band 8.0)
Programming	Python, Java, C, C++, C#, OCaml, StandardML, Prolog, SQL, \LaTeX
ML Libraries	PyTorch, TensorFlow, Keras, Scikit-learn, PyG, DGL, TorchDrug, GPy, GPyOpt, EconML
Music	Clarinet (Grade 10, soloist of the Cambridge University Chinese Orchestra Society)
Sports	Kendo (University team), Football (High school team), Badminton