

Tony RuiKang OuYang

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EDUCATION

University of Cambridge

Cambridge, United Kingdom

Master of Philosophy in Machine Learning and Machine Intelligence

Sep. 2023 – present

- Course size: 36
- Program acceptance rate: around 6~7% (one of the programs with lowest acceptance rate)
- Grades (without dissertation): Distinction

University of Oxford

Oxford, United Kingdom

International Visiting Student (Year 3) in Mathematics and Statistics

Sep. 2021 – Jul 2022

- Modules and Grades: Advanced Topics in Statistical Machine Learning (A); Algorithmic Foundations of Learning (A+); Advanced Simulation Methods (A); Topics in Computational Biology (A); Optimization for Data Science – (A+); Statistics and Data Analysis – (A+); Bayes Method – (A)
- Honour: International Exchange Program Scholarship (around 200,000 Chinese yuan)

Harbin Institute of Technology, shenzhen

Shenzhen, China

Bachelor of Engineering in Data Science

Sep. 2019 – Jun. 2023

- GPA: 90 /100
- Honour: Distinguished Graduates (top 10%); HITsz Role Model Student 2021 (top 5%); HITsz Excellent Student (2020&2021); HITsz 2nd Prize Scholarship (2020&2021)

PUBLICATIONS

[1] L2G2G: A Scalable Local-to-Global Network Embedding with Graph Autoencoders

RuiKang OuYang, Andrew Elliot, Stratis Limnios, Mihai Cucuringu, Gesine Reinert

COMPLEX NETWORKS 2023, Volume I, SCI 1141,

<https://arxiv.org/abs/2402.01614>

RESEARCH EXPERIENCE

Improved Iterative Denoising Energy Matching

University of Cambridge

Supervisor: Prof. José Miguel Hernández-Lobato

Mar 2024 – Present

- Research on improving the iDEM model for molecule generation
- We already developed a new algorithm to achieve better results.
- We're aiming for a top conference paper perhaps ICLR 2025.

Implicit Local Node Embedding Synchronisation for Graph Autoencoders

Harbin Institute of Technology, shenzhen

Supervisor: Prof. Yi Zhao

Dec. 2022 – May. 2023

- Undergrad Dissertation
- Research on a scalable, distributable and high performance Graph Autoencoder
- We proposed K-L2G2G model based on my previous research, which is scalability-and-accuracy promised

L2G2G: a Scalable Local-to-Global Network Embedding with Graph Autoencoders

University of Oxford

Supervisor: Prof. Gesine Reinert and Prof. Mihai Cucuringu

Mar. 2022 – Aug. 2022

- Research on the scalability of Graph Neural Network
- We proposed L2G2G model, which is scalable with comparable performance and naturally suitable for Federated Learning
- First author paper on Conference of Complex Network 2023, Volume I, SCI 1141
- Open source: <https://github.com/tonyauyeung/Local2GAE2Global>

INTERNSHIP

Alan Turing Institute | *Research Assistant*

Apr. 2022 – Jul. 2022

- Research about scalable Graph Neural Network and Federated Learning for data privacy
- Implementation and experiments using PyTorch and Torch Geometric
- A first author paper publicised on “Conference of Complex Network 2023”

UNISPACE | *Algorithm Trainee Engineer*

Jul 2021 – Sep 2021

- High performance computing in python
- Implementation of machine learning algorithms for Land Subsidence Detection based on satellite data
- Algorithm-implementation improving (Python)

COMPETITIONS&AWARDS

2nd Prize - Contemporary Undergraduate Mathematical Contest in Modeling

Sep. 2021

1st Prize - National College Students Mathematical Competition

Nov. 2020

2nd Prize - Contemporary Undergraduate Mathematical Contest in Modeling

Sep. 2020

SELECTED ACADEMIC PROJECTS

The Family of Denoising Diffusion Probabilistic Models

Jan. 2024 – Mar. 2024

- Replicate codes and exps of Diffusion Denoising Probabilistic Model (DDPM) and its variants (DDIM&ImprovedDDPM) from scratch
- Research on extension for Improved DDPM
- Open source: <https://github.com/tonyauyeung/The-Family-of-DDPMs>

Federated Curriculum Learning

Jan. 2024 – Mar. 2024

- Research on applying Curriculum Learning scheme on Federated Learning: self-paced learning, teacher-transfer and deep mutual learning
- Open source: https://github.com/tonyauyeung/curriculum_learning_L361

PPO in the Bayesian World

Nov. 2023 – Jan. 2024

- Research on performing Bayesian Optimization for Reinforcement Learning (Proximal Policy Optimization, PPO) hyper-parameters tuning
- Research on using multi-fidelity simulations to speed up tuning
- Open source: <https://github.com/tonyauyeung/PPO-in-the-Bayesian-World>

SELECTED ADVANCED ML/DL MODULES

Advanced Machine Learning: Neural Process, Diffusion Model, Transformer, Graph Neural Network and Bayesian Neural Network

Reinforcement Learning and Decision Making

Federated Learning

Machine Learning and Physical World: Gaussian Process, surrogate model and Bayesian Optimization

TECHNICAL SKILLS

Languages: Cantonese (native), Madarian (native), English (IELTS 7.0)

Programming: C, Python (PyTorch, Torch Geometric, Flower), Matlab, LATEX, Linux/Unix

Practical experiences in ML/DL: Gaussian Process (GP), Probabilistic Ranking, Latent Dirichlet Allocation, Reinforcement Learning (openAI GYM), Graph Neural Network (PyTorch+Torch Geometric), Speech Recognition system (PyTorch), Federated Learning (PyTorch+Flower), etc...

EXTRACURRICULAR ACTIVITIES

Wolfson College (University of Cambridge) football varsity

2023 - 2024

Harbin Institute of Technology (shenzhen) football varsity

2020 - 2023

Captain of Harbin Institute of Technology (shenzhen) Science School football team

2021 - 2023

Student Representative of Harbin Institute of Technology, shenzhen

2021

3rd place of Harbin Institute of Technology(shenzhen) Football League Season 19-20

2020

2nd place of Harbin Institute of Technology(shenzhen) Football League Season 20-21

2021

2nd place of Harbin Institute of Technology(shenzhen) Futsal League Season 20-21

2021

2nd place of Harbin Institute of Technology(shenzhen) Football League Season 22-23

2023