

Xiandong Zou

BASIC INFORMATION

- Gender: Male
- Nationality: Chinese
- E-mail: xiandong.zou20@imperial.ac.uk
- Website: <https://yqcca.github.io/>
- GitHub: Yqcca

EDUCATION

Imperial College London 2020/10-Present
MSci in Mathematics London, UK

On track for First Class

- Modules include:
 - Real Analysis and Complex Analysis (95.39%), Linear Algebra and Numerical Analysis (81.79%), Multivariable Calculus and Differential Equations (89.96%), Data Science Methods (85.40%), Network Science, Statistics, Time Series Analysis, Applied Probability, Statistical Theory

Shanghai Qibao Dwight High School 2017/09-2020/06
International Baccalaureate Diploma Programme Shanghai, China

IB Scores: 41/45

- Related Courses: Mathematics HL, Physics HL, Economics HL

SUMMER SCHOOL

Brown University 2019/07-2019/08
Introduction to Applied Geometry Providence, US

- Topics include: Statics, Dynamics, Projective Geometry

HONORS & AWARDS

- 2023 & 2024 Imperial College UROP Award
- 2022 Dean's List (Year 2) at Imperial College London
- 2019 American Mathematics Competition 12: Certificate of Distinction
- 2019 Euclid Mathematics Contest: Certificate of Distinction
- 2019 34th Annual AAPT Physics Bowl Contest: Honorable Award

PUBLICATIONS

- **Xiandong Zou**, Xiangyu Zhao, Pietro Liò, Yiren Zhao (2023). Will More Expressive Graph Neural Networks do Better on Generative Tasks? In *The 2nd Learning on Graphs Conference (LoG 2023)*.

RESEARCH EXPERIENCE

Imperial College London 2023/10-Present
MSci Individual Research Project London, UK

- Topic: Modern Statistics and Machine Learning for Public Good
- Conducted Bayesian statistical inference, such as Markov chain Monte Carlo, with Stan, Python, and R.
- Implemented and compared the Fast Fourier transform, Hilbert space and Karhunen Loeve Gaussian processes based on COVIDMOD dataset.

Undergraduate Research Opportunities Programme

2023/09-2023/12

Topic: Discrete Diffusion Model for Molecular Graph Generation

London, UK

- Used PyTorch, PyTDC, and RDKit to explore novel discrete diffusion frameworks for molecular graph generation.
- Reproduced two discrete diffusion frameworks (DiGress and GDSS) to generate graph-structured data.

Undergraduate Research Opportunities Programme

2023/07-2023/09

London, UK

- Topic: GNN Expressiveness and Graph Generative Models
- Used PyTorch, PyTDC, and TorchDrug to reproduce and improve current graph representation modules in graph generative models.
- Evaluated improved GNN-based graph generative models on the de-novo molecule design task and demonstrated that GNN-based graph generative models with advanced GNNs can achieve state-of-the-art results across many other non-GNN-based graph generative approaches.
- Source code: <https://github.com/Yqcca/graph-generative-models>
- Publication: <https://arxiv.org/abs/2308.11978>

Undergraduate Research Opportunities Programme

2022/05-2022/09

London, UK

- Topic: Explainable AI for Image Segmentation based on COVID-19
- Used PyTorch, Tensorflow, and MONAI to construct deep learning models to segment images related to healthcare and reproduce explainable modules in relevant papers.
- Analysed the local and global explainability of different deep learning models, such as U-Net, applied in COVID-19 diagnosis.

M2R Group Research Project

2022/05-2022/06

London, UK

- Topic: Bayesian Filtering
- Learnt Bayesian Filtering methods and Markov Chain Monte Carlo methods.
- Implemented the algorithms for several particle filters in Python.
- Analysed the numerical results based on the performance of Kalman Filter and Particle Filters in hidden Markov chain with linear Gaussian and non-linear Gaussian noise simulations.
- Project homepage: <https://github.com/Yqcca/Filters>

Individual Research Poster Project

2021/05-2021/06

London, UK

- Topic: Martingales
- Presented several theorems of martingales, such as the optional stopping theorem.
- Applied martingale convergence theorem in a Galton-Watson process, generation population problem, and discussed the corresponding convergence results under different situations.

INTERNSHIP

UTech Academy 2021 Summer

2021/07-2021/08

Shanghai, China

- Teaching Assistant
 - Taught Python and machine learning algorithms to high school students.
 - Supervised a group of students to complete their final AI projects in speech and alphabet recognition.

SKILLS

- **Languages:** Chinese (Native), English (Fluent, TOEFL 110)
- **Programming:** Python, MATLAB, R, Julia, Stan, LATEX
- **ML Libraries:** Tensorflow, Keras, Scikit-learn, PyTorch, PyG, TorchDrug, MONAI
- **Music:** Accordion
- **Sports:** Go, Bridge