YIXUAN HE

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University of Oxford

EDUCATION

University of Oxford, Dphil in Statistics   Oct. 2020 - Jun. 2024 (expected)
Clarendon Scholar (fully funded), Balliol Jason Hu Schorlarship
College: Balliol, supervisors: Mihai Cucuringu & Gesine Reinert
Research area: **graph neural networks**
Teaching assistant for: Applied Statistics (SB 1.1, MT 2022), Advanced Topics in Statistical Machine Learning (SC 4, HT 2022), Computational Statistics (SB 1.2, HT 2021), Statistics and Data management (for DTC in Department of Zoology, MT 2020)
Reviewer for: AAAI 2023, NeurIPS 2022, SIGKDD 2022, ICML 2022, WSDM 2022, IEEE Transactions on Knowledge and Data Engineering (TKDE), Journal of Complex Networks etc..

University of Edinburgh, UoE   Sept.2018 - June 2020
Major: **(BSc Hons) Maths & Stats** (**92.33%** Avg., **Rank # 1** in Maths & Stats, **First Class**)
Courses: Stats Methodology(**100%**), Financial Maths(**100%**), Numerical PDEs(**100%**), Fundamentals of Optimization(**98%**), Nonparametric Regression Models(96%).
Paid job at UoE: **Digital Skills Trainer-Python**

University of California, Berkeley   Jan. 2018 - May 2018
Courses: Numerical Analysis (**A+**), Complex Analysis (**A+**), Abstract Algebra (A)(GPA: **4.0/4.0**)

South China University of Technology, SCUT   Sept.2016 - June 2020
Major: **Mathematics & Applied Mathematics** (Rank **1/60**)(Outstanding graduate)
Overall GPA for 2016-18: **3.99/4.0**, Major GPA: **4.0/4.0**; transferred to Edinburgh on 2+2 program
Winning 2 years' **National Scholarship** granted by Ministry of Education of China
650/710 in CET6, overtaking **99.98%** students in SCUT

RESEARCH EXPERIENCE

Oxford: Graph Neural Networks and its Applications   Oct. 2020 -
Doctoral research   *Supervisors: Mihai Cucuringu, Gesine Reinert*

· **First** author of **ICML 2022** paper: GNNRank: Learning Global Rankings from Pairwise Comparisons via Directed Graph Neural Networks.
· **First** author of **SDM 2022** paper: SSSNET: Semi-Supervised Signed Network Clustering.
· **First** author of **WSDM 2022** Doctoral Consortium paper: GNNs for Node Clustering in Signed and Directed Networks.
· Second author of **NeurIPS 2021** paper: MagNet: A Neural Network for Directed Graphs.
· Third author of **CIKM 2021** paper: PyTorch Geometric Temporal: Spatiotemporal Signal Processing with Neural Machine Learning Models.(**best paper award**).
· **First** author of **LoG 2022** paper: DIGRAC: Digraph Clustering Based on Flow Imbalance.
· **First** author of **LoG 2022** paper: MSGNN: A Spectral Graph Neural Network Based on a Novel Magnetic Signed Laplacian.
· Third author of **LoG 2022** paper: CEP3: Community Event Prediction with Neural Point Process on Graph.
· **First** author of paper: PyTorch Geometric Signed Directed: A Software Package on Graph Neural Networks for Signed and Directed Graphs.

UoE: AUROC vs AUPRC: A Comparison of Performance Measures in Classification Problems   Sept. 2019 - Apr. 2020
UoE Honors Project   *Supervisor: Timothy I. Cannings*

· Collected data, compared measure scores, **analysed measure properties** & data properties.

UCLA CSST summer research/REU: Deforestation Brazil   June 2019 - Sept. 2019
Funded by NGA & NSF   Supervisors: Christian Parkinson, Andrea L. Bertozzi, Stanley J. Osher

· Conducted data mining, data analysis, matlab programming & model construction.
· Implemented **level set method**, numerical PDEs, optimal path searching, satellite image processing, Maximum Penalized Likelihood Estimation (MPLE), time series simulation etc.
· **Delivered a talk** at IPAM's "The Level Set Collective" seminar invited by Professor Stanley Osher.
· **Presented a** poster at Intelligence Community Academic Research Symposium (ICARS) 2019.

SCUT: Robust Image Salient Object Perception Prior for Image Segmentation based on PDEs Related Methods   May 2018 - May 2020
Funded by National Natural Science Foundation of China (**NSFC**)   *Supervisor: Delu Zeng*

· Studied level set methods and **neural networks** on **semantic image segmentation**.
· **First author** of paper at workshop of **CVPR 2019**: Scan-flood Fill (SCAFF): an Efficient Automatic Precise Region Filling Algorithm for Complicated Regions.
· Worked on lung nodule segmentation using MEnet.
· 2th auth. of: Ro-SOS: Metric Expression Network (MEnet) for Robust Salient Object Segmentation.
· Utilized Linux, Colab, Caffe, TensorFlow, PyTorch & programming in Python.

SCUT: Efficiency of Collaborative Innovation Knowledge Output in Professional Towns in Internet + Times   May 2017 - May 2018
Funded by MOE of PRC   *Supervisors: Shifu Wang, Miaoxi Zhao, Shenquan Liu*

· **Cross-disciplinary**: Maths & Urban Planning. Responsible:data mining & analysis, paper writing.
· **Led** the project as part of the National Training Program of Innovation for Undergraduates.

CONFERENCES/SUMMER SCHOOLS

4th IMA Conference on The Mathematical Challenges of Big Data	Speaker	Sept. 2022
UC Berkeley Simons Institute Deep Learning Theory Workshop	Participant	Aug. 2022
39th International Conference on Machine Learning (**ICML**)	Author	Jul. 2022
SIAM International Conference on Data Mining (**SDM**)	Author	Apr. 2022
15th ACM Int. Conf. on Web Search and Data Mining (**WSDM**)	Doctoral Cons.	Feb.2022
35th Conf. on Neural Information Processing Systems (**NeurIPS**)	Author	Dec.2021
The 10th Int. Conf. on Complex Networks and their Applications	Author	Nov.2021
Int. Conf. on Information and Knowledge Management (**CIKM**)	Author	Nov.2021
Intelligence Community Academic Research Symposium (**ICARS**)	Poster presenter	Sept. 2019
Computer Vision and Pattern Recognition (**CVPR**)	Author	June 2019
European Conf. on Computer Vision (**ECCV**) pre-conference	Attendee	July 2018
Berkeley Undergraduate Number Theory Conference	Attendee	Apr. 2018

MAJOR AWARDS

Grant	2022′s ICML Participant Award
Grant	2022′s Simons Institute Summer School Fund
Grant	2022′s Balliol's fund on IMA Conf. on The Mathematical Challenges of Big Data reg.
Award	2022′s SIAM Student Travel Award for SDM'22
Award	2022′s SIGIR Student Registration Award for WSDM'22
Grant	2021′s Balliol's fund on Complex Networks 2021 reg.
Grant	2021′s Balliol's fund on NeurIPS 2021 reg.
Grant	2021′s Balliol's fund on ACM membership & CIKM'21 registration
Prize	2020′s Napier Medal and Gangadhar Balwant Gadgil Prize (**top** Maths student @UoE)
Prize	2020′s Lawley Memorial Prize (**top** student in Maths & Stats @UoE)
Scholarship	2020′s **Clarendon Scholarship** & Balliol Jason Hu scholarship at Oxford
Honor	2020′s Outstanding Graduate at SCUT Maths Dept.
Prize	2019′s Arthur Erdelyi Prize (For top 3 performing Math students @UoE)
Prize	2019′s James Ward Memorial Prize (**top** student in Maths & Stats @UoE)
Second Prize	2018′s ICM/MCM International **Mathematical Modeling** Competition
Grand Prize	2018′s Maths Competition of SCUT (Maths Group) (**Rank # 1**)
Honor	2017-2018′s one of the ten **Role Models to Merit Students** at SCUT
Prize	2017′s & 2018′s **National Scholarship**
Second Prize	2017′s "9th National College Student **Maths Competition** (Maths)" in Guangdong
Second Prize	2017′s National College Student Mathematical Modeling Competition (Guangdong)

COMPUTER SKILLS

Programming:	**Python (Advanced)**, C++ (Intermediate), VB (Basic) & Pascal (Basic)
Statistical Analysis:	**R (Advanced)**, SQL (Intermediate) & SPSS (Intermediate)
Modelling:	**Matlab (Advanced)**, Maple (Intermediate) & Xpress (Intermediate)
Paper writing:	**Latex (Advanced)**

WORK EXPERIENCE

Applied Scientist Intern at Amazon Web Services AI Shanghai Lablet   Nov. 2021 -

· Mentor: David Wipf.
· Conduct research on graph neural networks.

Director of Department of Visiting Scholars in Oxford Chinese Students & Scholars Association (OXCSSA)   July 2021 - July 2022

· **Co-organized** 2021 welcoming event for new students to University of Oxford, hosted the Shenzhen welcoming event.
· Collected information for visiting scholars & built contact.
· **Divided work** as the **leader** of a team of over 15 members.
· **Organized** events for visiting scholars: visiting scholars' tea party, hiking, formal, punting etc..
· Collaborated with other departments such as the academic department to hold virtual and in-person talks.

UoE's Digital Skills Trainer - Python   Dec. 2019-May 2020

· **Delivered Python training courses**, reviewed & improved existing Python training.
· Recorded lectures: Introduction to Python and Python for Data Science.

Head of Class   Sept. 2013-June 2018

· Conveyed notifications, organized activities & led by example.
· 2017′s & 2018′s South China University of Technology **Outstanding Student Leader**.
· 2016-2017′s **outstanding class** of SCUT & 2017-2018′s top-16 classes of SCUT.

University Student Representative   May 2017-May 2018

· Actively listened to students′ opinions & participated in raising proposals.
· Outstanding Student Representative of South China University of Technology in 2017.

Member of Public Relationship Dept., Math Student Union   Sept. 2016-Oct. 2017
· **Led** the hosting of a social party in School of Mathematics.
· 2017′s **Star** in Mathematics Student Union.

Student Assistant for School of Mathematics   Sept. 2016-Aug. 2017
· Assisted in organizing materials & releasing notifications.
· Outstanding individual in work study of South China University of Technology.

Teaching Support in a Primary School in Longsheng Rural Village   July 2017
· Devised & delivered lectures in singing, dancing, craftmanship & story-telling.
· **Leader** in hosting the closing ceremony.
· **Visited families** to collect information & offer suggestions.