

# YIXUAN HE

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University of Oxford

## EDUCATION

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**University of Oxford, Dphil in Statistics** Oct. 2020 -  
**Clarendon Scholar (fully funded)**, Balliol Jason Hu Scholarship  
College: Balliol, supervisors: Mihai Cucuringu & Gesine Reinert Research area: **graph neural networks**

**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

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

- First author of paper: **DIGRAC: Digraph Clustering with Flow Imbalance**.
- Second author of **NeurIPS 2021** paper: **MagNet: A Neural Network for Directed Graphs**.
- Third author of **CIKM'21** paper: **PyTorch Geometric Temporal: Spatiotemporal Signal Processing with Neural Machine Learning Models**.
- Also working on signed networks (work under review).

***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.
- 2<sup>th</sup> 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, Miaoqi 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

Int. Conf. on Information and Knowledge Management ( <b>CIKM</b> )	Author	Nov.2021
Intelligence Community Academic Research Symposium ( <b>ICARS</b> )	Poster presenter	Sept. 2019
Computer Vision and Pattern Recognition( <b>CVPR</b> )	Workshop 1 <sup>st</sup> author	June 2019
European Conf. on Computer Vision( <b>ECCV</b> ) pre-conference	Attendee	July 2018
Berkeley Undergraduate Number Theory Conf.	Attendee	Apr. 2018

## MAJOR AWARDS

<b>Grant</b>	2021's Balliol's fund on ACM membership & CIKM registration
<b>Prize</b>	2020's <b>Napier Medal and Gangadhar Balwant Gadgil Prize (top Maths student @UoE)</b>
<b>Prize</b>	2020's Lawley Memorial Prize ( <b>top</b> student in Maths & Stats @UoE)
<b>Scholarship</b>	2020's <b>Clarendon Scholarship</b> & Balliol Jason Hu scholarship at Oxford
<b>Honor</b>	2020's Outstanding Graduate at SCUT Maths Dept.
<b>Prize</b>	2019's Arthur Erdelyi Prize (For top 3 performing Math students @UoE)
<b>Prize</b>	2019's James Ward Memorial Prize ( <b>top</b> student in Maths & Stats @UoE)
<b>Second Prize</b>	2018's ICM/MCM International <b>Mathematical Modeling</b> Competition
<b>Grand Prize</b>	2018's Maths Competition of SCUT (Maths Group) ( <b>Rank # 1</b> )
<b>Honor</b>	2017-2018's one of the ten <b>Role Models to Merit Students</b> at SCUT
<b>Prize</b>	2017's & 2018's <b>National Scholarship</b>
<b>Second Prize</b>	2017's "9 <sup>th</sup> National College Student <b>Maths Competition</b> (Maths)" in Guangdong
<b>Second Prize</b>	2017's National College Student Mathematical Modeling Competition (Guangdong)

## COMPUTER SKILLS

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

## WORK EXPERIENCE

**Director of Department of Visiting Scholars in Oxford Chinese Students & Scholars Association (OXCSSA)**

July 2021 -

- **Co-organized** 2021 welcoming event for new students to University of Oxford, hosted the Shenzhen welcoming event.
- Collected information for visiting scholars & built contact.

**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, craftsmanship & story-telling.
- **Leader** in hosting the closing ceremony.
- **Visited families** to collect information & offer suggestions.