



RESEARCH INTEREST

1. Geometric Representation Learning; 2. AI4Science, emphasizing Biomedicine, Chemistry, Genomes and Oncology

EDUCATION

University of Cambridge	Cambridge, UK
Ph.D. Machine Learning, with Prof. Joan Lasenby , Department of Engineering	Oct '19 – Dec '22
<ul style="list-style-type: none">On leave '19, Scholar & Fellow of Cambridge Trust, Kathy Xu (Capital Today), CAPE, CPSVisiting Scholar at Isaac Newton Institute, Cambridge Math, Stanford Bio-X, Caltech AI4Science	
Nanjing University	Nanjing, CN
B.Sc. Physics (3.88/4.00), minor B.Eng. InfoEng (4.00/4.00), Valedictorian, Admitted at age 15	Sep '14 - Jun '18
<ul style="list-style-type: none">Gifted Class, KYM Honours School, seven (e.g., JASSO) scholarships, MCM meritorious winnerExchange studies at UC Berkeley Physics & EECS (Fall 2016) and Meiji Japanese Studies (Spring 2018)	
Suzhou High 2 nd Prizes in both Biology and Physics Olympiad, after university admission	'12 - '14, Suzhou, CN

EMPLOYMENT

Caltech and Entos , closely with NVIDIA (Clara™ Discovery Team)	La Jolla & Pasadena, US
Visiting PhD and Intern, with Prof. Anima Anandkumar, Prof. Thomas Miller III, Dr. Matt Welborn	May '22 - Apr '23
<ul style="list-style-type: none">Focus: Self-Supervised Learning, Computational Chemistry, Genomes	
BioMap	Beijing, CN
Research Intern, with Prof. Le Song	Jan '22 - Mar '22
<ul style="list-style-type: none">Focus: Machine Learning for Efficient Molecular Dynamic Simulations	
Amazon AI	Cambridge & London, UK
Applied Scientist Intern, Alexa Sector, with Prof. Emine Yilmaz, Yunlong and Jordan	Jun - Oct '21
<ul style="list-style-type: none">Focus: Evaluating {Product, Social} Graph Edits	
Google Research	Mountain View, US
Research Intern, Daydream Sector	Summer '20 (cancelled due to COVID-19)
<ul style="list-style-type: none">Focus: Real-Time 3D Face Reconstruction	
Cantab Care	Cambridge, UK
Co-Founder, CTO	Mar - Aug '19
<ul style="list-style-type: none">Collaborated with 37 hospitals on personal medical record management, incubated in Accelerate CambridgeCoordinated with co-founders graduated from Berkeley & Stanford, worked at Amino Cap and Deutsche Bank	
China International Capital Corporation	Shanghai, CN
Quantitative Researcher Intern, Asset Management Sector, with Executive Director Dr. Haiyang Zheng	Jul - Sep '18
<ul style="list-style-type: none">Developed and back-tested trading strategy on equity of A-share, Sharpe ratio: 1.45, annual return: 30+%Utilised Hidden Markov Model to predict market trends, built efficient databases for massive data processing	
Mingshi Investment	Shanghai, CN
Quantitative Researcher Intern, Algorithmic Trading Sector	May - Jul '18
<ul style="list-style-type: none">Compiled t+0 strategy on A-share, raised the IC between signals and lag 30-min return from 0.04% to 2.7%Combined 500+ signals with methods such as Lasso, Random Forest, Support Vector Machine and XG-Boost	
Nanjing University, UC Berkeley and Lawrence Berkeley National Lab	Nanjing, CN & Berkeley, US
Research Assistant on Electronic & Photovoltaic Devices , with Prof. Xinran Wang, Prof. Ali Javey	Jun '16 - Feb '18
<ul style="list-style-type: none">Designed a novel transistor structure (NCFET) with low power consumption and high switching performance.Improved the efficiency, fabrication, packing and testing of photovoltaic devices (solar cells) at Cal and LBNL.	
Stanford University	Palo Alto, US
Research Assistant on Compressed Neural Network , with Dr. Jiantao Jiao, now Prof at Berkeley	Aug - Sep '16
<ul style="list-style-type: none">Designed and deployed a neural network module on mobile devices. An Android application equipped with SqueezeNet was developed for real-time image recognition, reaching a top-5 accuracy of 83.4% on ImageNet	

SELECTED ACADEMIC SERVICES

Teaching Assistant, Demonstrator and Grader:

- [Statistical Inference](#) Cambridge Engineering, Lent 2020, 2021
- [Lab: Spectrum Analysis](#) Cambridge Engineering, Michaelmas 2020
- [Statistical Signal Processing](#) Cambridge Engineering, Michaelmas 2019, 2020

Reviewer:

- Event Proposal: NeurIPS Workshop, ICML Workshop
- Conference and Workshop: ICLR, ICML, NeurIPS, NeurIPSW, ICLRW, ICMLW, CVPR, KDD
- Journal: Nature Electronic, PAMI, IJCNN, Pattern Recognition, Frontiers in Public Health, ACM TAACL

Co-Organiser:

- Workshops on "AI for Science" @ [NeurIPS 2021](#), [ICML 2022](#) and [NeurIPS 2022](#) [Tentative]
- Workshop on "Machine Learning for Genomics and Genetics" @ [NeurIPS 2022](#) [Tentative]

Mentor:

- Puria Radmard, Trinity InfoEng '22, "Generative Models on Satellite Images"
- a Group of Three Berkeley EECS MEng '22, "Continual Segmentation Adaptation"
- Yuan 'er, Tsinghua PhD '22, "Geometrical Selection on Asteroid-based Navigation"

Consultant:

- ZhenRep Fellow on AI/ML Technology Sector, [ZhenFund](#)

SELECTED TALKS

- seminars at QishiCPC (Premium Member) 18 - Present
- call/pitch/presentations on "Cantab Care", a startup I co-founded 19

- < Evaluating Self-Supervised Learned Molecular Graphs > @ (ex) Miller Group, Caltech 22.07
- < Overview of [DepMap](#) > @ Potluck Reading Group 22.07
- < Pre-training Molecular Graphs with 3D Geometry > @ Lennard-Jones Centre, Cambridge 22.06
- < Rethinking Self-Supervised Learning on Structured Data > @ ML/NLP Oxford 22.02
- < Denoising Graph via Edge Editing > @ Amazon Machine Learning Conference 21.10
- < Self Supervised Learning in 3D Vision > @ Amazon × UCL Seminar 21.07
- < Modelling Protein with Transformers > @ [Genetics](#), Cambridge 21.07
- < Panel Discussion on AIoT >, hosted by Dr. [Juejia Zhou](#), Director of Xiaomi Tech 21.06
- < Neural Volume Rendering > @ [SigProc](#), Cambridge 21.03
- < A Collaborative Online AI Engine for CT-based COVID-19 Diagnosis > @ [CMIH & Div-F Conf](#) 20.08 & 09
- < Machine Learning on Sets > @ [MLG](#), Cambridge 20.04
- < 3D Deep Learning Meets Points Cloud > @ St Edmund's College, Cambridge 20.02
- < Federated Machine Learning with Differential Privacy > @ CUED [Hackbridge](#) Demo Day 19.10
- < Acceptance Speech > Awardee Representative @ [Cathy Xu](#) Fellowship Awarding Event 18.07
- < Commencement Speech > Valedictorian @ [KYM Honours School](#), Nanjing University 18.06

SELECTED OPEN-SOURCE CONTRIBUTION [[GITHUB](#)]

- [PyTorch3D](#) Developed docker environment and modules such as Chamfer distance
- [Metric Learn](#) Implemented some Mahalanobis metric learning algorithms and math formulation
- [openmlsys-zh](#) Worked on chapters of "Federated Learning System", and "Graph modelling System Design"

SELECTED SKILLS

- Programming** Python, MATLAB, C++, Bash, Bloomberg
- Membership** IEEE {CS, CIS, RAS, Student, Young Professionals}, QishiCPC Premium
- Language** Chinese (native), English (professional), French (elementary), Japanese (elementary)
- Certificate** Springer Nature Author Training, IBM Qiskit Summer School on Quantum Machine Learning

MISCELLANEOUS

Writing [notes](#); Reading [books](#); Part-time editor @ [QbitAI](#) & [Scientific American](#); 3rd level **National Athlete** in 400-metre; Vice president of [Cambridge Algorithmic Trading Society](#), 10th level of Erhu (musical instrument)

PUBLICATIONS [GOOGLE SCHOLAR]

Book chapter:

1. "Machine Learning Systems: Design and Implementation" (in Chinese), in press 2022 (Tsinghua University Press), also the English version is in preparation, will be taught in Peking University.

During PhD:

1. Ann et al., "Liver Fibrosis Staging using Deep Learning on Whole Slide Images", drafting, for Lancet Digital Health
2. Yuan Zhong, **Hanchen Wang**, Joan Lasenby, Baoxi Heyin, "Geometrical Selection for Asteroid-Based Optical Autonomous Navigation", drafting, for Nature Communications
3. **Hanchen Wang***, Jean Kaddour*, Shengchao Liu, Jian Tang, Matthew Kusner, Joan Lasenby, Qi Liu "Evaluating Self-Supervised Learning for Molecular Graphs Embeddings", in review for NeurIPS 2022, presented at ICML Pre-Training and AI4Science workshops
4. Shengchao Liu*, Yuanqi Du, **Hanchen Wang**, Joan Lasenby, Bolei Zhou, Jian Tang, "Unsupervised Discovery of Steerable Factors in Structured Data", in review for NeurIPS 2022
5. Dingmin Wang, Shengchao Liu*, **Hanchen Wang***, Linfeng Song, Jian Tang, Le Song, Bernardo Cuenca Grau, Qi Liu, "GraphRetrieval: Augmenting Message Passing by Retrieving Similar Graphs", in review for CIKE 2022
6. **Hanchen Wang***, Yuanqi Du*, Tianfan Fu*, Yoshua Bengio, ..., Max Welling, Marinka Zitnik, "Enabling Scientific Discovery with Artificial Intelligence", review paper, drafting, in revision for **Nature**
7. Jiefeng Gan*, **Hanchen Wang*** et al., "Searching saliency lesion in histopathological images for biomarkers prediction with deep learning", research paper, in review for **Nature Communications**
8. **Hanchen Wang**, Chaoyang He, James Zou, "Open Problems in Federated Digital Health", comment paper, in revision for **Nature Machine Intelligence**
9. **Hanchen Wang***, M. N.*, "Matching Point Sets with Quantum Circuits Learning", **invited by Editors, with Travel Award (from IEEE and Cambridge)**, ICASSP 2022 [Website][Code]
10. Shengchao Liu, **Hanchen Wang**, Weiyang Liu, Joan Lasenby, Hongyu Guo, Jian Tang, "Pre-training Molecular Graph Representation with 3D Geometry", ICLR 2022, also presented at NeurIPS 2021 SSL, ICLR
11. **Hanchen Wang**, Yunlong Jiao, Jordan Massiah, "Denoising Graph with Edge Editing", **contributed talk** at Amazon Machine Learning Conference (AMLC, Internal) 2021, public version in preparation
12. Weiyang Liu*, Zhen Liu*, **Hanchen Wang***, Liam Paul, Bernhard Schölkopf, Adrian Weller, "Iterative Teaching by Label Synthesis", NeurIPS 2021, **Spotlight**
13. Xiang Bai (Prof.)*, **Hanchen Wang (B.S.)***, Liya Ma (M.D)*, Yongchao Xu (Prof.)*, Jiefeng Gan (M.S.)*, ..., Carola Schönlieb (Prof.), Tian Xia (Prof.), "Advancing COVID-19 Diagnosis with Privacy-Preserving Collaboration in Artificial Intelligence", **Nature Machine Intelligence** 2021 (Research Article)[Website][Code], **Media Coverage:** HUST, Cambridge, Horizon Magazine, Tech Xplore, MIT Technology Review, Synced, ...
14. **Hanchen Wang**, Qi Liu, Xiangyu Yue, Joan Lasenby, Matthew J. Kusner, "Unsupervised Point Cloud Pre-training via Occlusion Completion", ICCV 2021 [Website][Code], presented at ICLR 2021 WeaSul Workshop
15. Yun-Hao Cao, Jianxin Wu, **Hanchen Wang**, Joan Lasenby, "Neural Random Subspace", Pattern Recognition 2021
16. **H. Wang**, Nina Hlača, Preethi Lahoti, Krishna Gummadi, Adrian Weller, "An Empirical Study on Learning Fairness Metrics for COMPAS Data with Human Supervision", arXiv, presented at NeurIPS 2019 HCML, **with Travel Award**

During Undergraduate:

17. Current-controlled Propagation of Spin Waves in Antiparallel, Coupled Domains, **Nature Nanotechnology** 2019
18. Dopant-Free Partial Rear Contacts Enabling 23% Silicon Solar Cells, Advanced Energy Materials 2019
19. Stable Dopant-Free Asymmetric Heterocontact Silicon Solar Cells with Efficiencies above 20%, ACS Energy Letters 2018
20. Negative Capacitance 2D MoS₂ Transistors with Sub-60mV/dec Subthreshold Swing over 6 Orders, 250 μA/μm Current Density, and Nearly-Hysteresis-Free, IEDM 2017, **Oral**
21. Molecular Mechanism of Self-Assembly of Aromatic Oligoamides into Interlocked Double-Helix Foldamers, JPCB 2017
22. Microchannel Contacting of Crystalline Silicon Solar Cells, **Nature Scientific Reports** 2017
23. Logical Integration Device for Two-Dimensional Semiconductor Transition Metal Sulfide, **Invited**, Acta Physica Sinica 2017

王瀚宸 邮箱 | 个人主页



研究兴趣: 几何表示学习(侧重于表征学习方法以及生物医学、基因和计算化学中的应用), 在 NATURE(在审)等期刊和 NeurIPS 等会议上发表共计 23 篇文章。

教育

剑桥大学信息工程系 2019.10 - 2022.12 英国剑桥

机器学习博士, 研究方向: 几何表示学习, 导师: Joan Lasenby 教授 (三一学院)

- 奖学金和学术奖金来源: 剑桥海外基金会, 徐新(今日资本), 剑桥先进光电中心, 剑桥哲学学会等
- 与 Isaac Newton Institute, Cambridge Math, Caltech AI4Science, Stanford Bio-X 等有长期合作, 访问与交流

南京大学匡亚明学院 2014 - 2018 南京

物理学士(GPA: 3.88/4.00), 辅修信息工程(GPA: 4.00/4.00), 15 岁获得本科录取, 毕业时作为学生代表发言

- 获得包括 JASSO 在内的国际、国级、校级的七项奖学金, 美国大学生数学建模比赛一等奖
- 在 UC Berkeley Physics & EECS 以及日本明治大学日语系进行学期交换学习

苏州中学 高中奥林匹克竞赛物理学二等奖和生物学二等奖(在保送本科之后, 个人兴趣使然) 2012 - 2014 苏州

工作

加州理工学院、Entos 与英伟达 2022.05 - 2023.04, 美国加州

联培博士生, 与 Anima Anandkumar, Thomas Miller, 诺奖得主 Frances Arnold 三位教授合作, 方向: AI for Science

真格基金 技术顾问(ZhenRep Fellow), 人工智能和硬科技方向 2022.05 - 至今, 北京, 英国剑桥和美国加州

百图生科 2021.01-2022.03 北京

实习生, AI 研究部门, 与宋乐教授合作, 方向: 机器学习加速的分子动力学模拟

Amazon AI 2021.07-2021.10, 英国剑桥和伦敦

实习生, Alexa (Online Shopping) 部门, 与 Emine Yilmaz 教授合作, 方向: 基于图模型的编辑算法

Google Research 2020 暑期(因新冠疫情取消), 美国山景城

实习生, Daydream (AR/VR) 部门, 方向: 实时三维场景重建

Cantab Care 2019.03 - 2019.08, 英国剑桥

联合创始人, 首席技术官

- 与中国 37 家医院合作, 以智能病历为切入口, 探索构建现代医疗生态系统, 在剑桥商学院加速器孵化
- 另外两位联合创始人从 UC Berkeley 和 Stanford 毕业后, 曾在 Amino Capital 和 Deutsche Bank 全职工作

中金公司 2018.07 - 2018.09 上海

实习生, 资管自营部门, 由执行董事郑海洋博士直接指导

- 开发并回测基于 A 股的中频量化交易策略, Sharpe ratio: 1.45, annual return: 30%+
- 运用隐式马尔科夫模型预测市场趋势, 搭建海量数据处理系统

鸣石投资 2018.05 - 2018.07 上海

实习生, 量化交易部门

- 基于 A 股开发 t+0 交易策略, 将信号和 30 分钟后回报间的 Information Coefficient 从 0.04% 提升至 2.7%
- 探索基于 Lasso, Random Forest, SVM, XG-Boost 等方法去结合 500 余个信号

南京大学, 加州大学伯克利分校和劳伦斯伯克利国家实验室 2016.06 - 2018.02, 南京和美国伯克利

研究助理, 微电子器件和太阳能电池, 与王欣然和 Ali Javey 两位教授合作

- 设计一种新式的负电容晶体管架构, 同时实现低能耗与高性能, 成果发表在顶级会议 IEEE IEDM
- 在提升太阳能电池的转化效率、生产工艺、封装和测试等过程进行尝试, 参与并发表多篇期刊论文

斯坦福大学 2016.08 - 2016.09 美国帕劳阿图

研究助理, 压缩神经网络, 与焦建涛博士合作(现为 UC Berkeley 教授)

- 在移动设备上部署 SqueezeNet, 开发的实时图像识别的安卓程序在 ImageNet 上的 top-5 准确率达到 83.4%

其它

担任 Nature Electronics, NeurIPS, ICML, ICLR, CVPR 等期刊和会议的审稿人; 在 NeurIPS '21、ICML '22 组织 AI4Science Workshop; 400 米田径国家三级运动员; 曾担任剑桥大学算法交易协会副主席; 9 岁获得二胡十级