

Yixin Wang, PhD student

Machine Learning, Biomedical Imaging, Neuroscience

✉ yixinwang@stanford.edu

🌐 <https://www.yixinwang.com/>

Yixin Wang is a second-year PhD student of Bioengineering at Stanford University, co-advised by [Kilian M. Phol](#) and [Michael Zeineh](#). She got her master degree from Institute of Computing Technology, Chinese Academy of Sciences, majoring in Computer Science, supervised by [Prof. George He](#). Since Sept.2019, she has been an intern in AI Lab, Lenovo research, advised by [Prof. Jianping Fan](#) from UNC Charlotte and IEEE Fellow [Dr. Yong Rui](#).

Yixin is currently working on AI + healthcare, with a special focus on advancing neuroimaging analysis using machine learning methods. She has more than **10+ publications with 1000+ citations** in peer-reviewed conference proceedings and journals, and won **top prizes** in MICCAI challenges. She believes AI can be instrumental to improve the efficacy of many clinical applications and biology problems.

Yixin loves traveling, running, photography, communication, food, music and making friends! Her colleagues describe her as creative, diligent and goal-oriented.

Education

Stanford University PhD student in Bioengineering · Machine learning, medical imaging, neuroscience · School of Engineering Fellowship	2022-Present
Institute of Computing Technology, Chinese Academy of Sciences (ICT, CAS) M.Eng in Computer Science · Grade: 3.8/ 4.0 · Presidential Scholarship · Research on computer vision, medical imaging	2019-2022
Shandong University (SDU) B.Eng in Computer Science and Technology · Grade: 4.0/ 4.0 93.53/ 100 · Ranking list: 1/ 111 · National Scholarship (Each year)	2015-2019

Experience

PhD student, The Computational Neuroimage Science Lab (CNSLAB), Stanford Neuroimaging, human cognition and behavior analysis · Transfer learning on adolescent brain cognitive development · Imputing brain measurements across data sets via graph neural networks	2023–Present
PhD student, Zeineh Lab, Stanford Neuroimaging, Alzheimer disease · Developing pipeline for Alzheimer biomarker analysis based on Multi-modal imaging.	2023–Present
Research student, Bo Lab, Stanford Genome analysis · Developing Transformer-based methods to compare protein similarities · Mapping Single-cell Atlases	2022.9–2023.1
Co-Research, Michigan State University Single Cell analysis · Work with Prof. Jiliang Tang and Prof. Yuying Xie · Research on single cell segmentation & imputation on fluorescent images.	2022–Present
Co-Research, Harvard Medical School (HMS) & MIT Segmentation, Efficient-annotation, Uncertainty · Work with Prof. William T. Wells, Prof. Sarah Frisken and Dr. Jax Luo · Research on advanced machine learning algorithms on biomedical imaging and surgery. · 1 accepted paper (IEEE TMRB), 2 ongoing projects.	2020–2021
Postgraduate Research, Chinese Academy of Sciences	2019–2022

Computer vision, Deep learning

- Research on advanced algorithms on segmentation, detection in images and videos.
- Deep learning algorithm development including semi-supervised learning, unsupervised learning, multi-modal learning.

Research Intern, Lenovo AI Lab

2019–2022

Computer vision, Medical imaging

- Medical image analysis including brain, abdomen, lung, etc., in CT, MRI images.
- Research publications in conferences (MICCAI, ISBI, MIDL etc.) and journals (MedIA, MP).
- Honored as Outstanding Interns.

Undergraduate Research, Shandong University

2015–2019

Data mining, Optimization algorithm, Community detection

- Research on complex network cluster analysis based on optimized algorithms and publish the first EI paper as the first author.
- Research on technologies for spatio-temporal relevance information reconstruction.

Vice President of Student Union, Shandong University

2017–2018

Communication, Organization, Coordination

- Manage student affairs and organize all kinds of students activities and competitions.
- Honored as many prizes for outstanding work.

Publications

Imputing Brain Measurements Across Data Sets via Graph Neural Networks

Yixin Wang, Wei Peng, Susan F. Tapert, Qingyu Zhao, Kilian M. Pohl

6th workshop on Predictive Intelligence in Medicine (PRIME 2023) - MICCAI 2023

Rethinking Medical Report Generation: Disease Revealing Enhancement with Knowledge Graph

Yixin Wang, Zihao Lin, Haoyu Dong

Interpretable Machine Learning in Healthcare, International Conference on Machine Learning (ICML 2023)

Sap-detr: Bridging the gap between salient points and queries-based transformer detector for fast model convergence

Yang Liu, Yao Zhang, **Yixin Wang**, Yang Zhang, Jiang Tian, Zhongchao Shi, Jianping Fan, Zhiqiang He

Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2023)

SpatialCTD: a large-scale TME spatial transcriptomic dataset to evaluate cell type deconvolution for immunology

Jiayuan Ding, Julian Venegas, Qiaolin Lu, **Yixin Wang**, Lidan Wu, Wei Jin, Hongzhi Wen, Renming Liu, Wenzhuo Tang, Zhaoheng Li, Wangyang Zuo, Yi Chang, Yu Lei, Patrick Danaher, Yuying Xie, Jiliang Tang
bioRxiv)

Deep Learning in Single-Cell Analysis

Dylan Molho, Jiayuan Ding, Zhaoheng Li, Hongzhi Wen, Wenzhuo Tang, **Yixin Wang**, Julian Venegas, Wei Jin, Renming Liu, Runze Su, Patrick Danaher, Robert Yang, Yu Leo Lei, Yuying Xie, Jiliang Tang

Submitted to Transactions on Intelligent Systems and Technology

Incorporating Uncertainty into Path Planning for Minimally Invasive Robotic Neurosurgery

Sarah Frisken, Jie Luo, Nazim Haouchine, Steve Pieper, **Yixin Wang**, William T. Wells, and Alexandra J. Golby

IEEE Transactions on Medical Robotics and Bionics

The Automatic Teaching Machine: A Prototype System for Self-taught Segmentation Labelers

Yixin Wang, Jie Luo, Zhe Xu, Shun Yao, Nazim Haouchine, Tina Kapur, William Wells, Sarah Frisken

Revision

Confidence-Guided Radiology Report Generation

Yixin Wang, Zihao Lin, Jiang Tian, Yang Zhang, Jianping Fan, Zhiqiang He

Pre-print

Cross-domain Few-shot Learning for Rare Skin Disease Segmentation

Yixin Wang, Zhe Xu, Jiang Tian, Jie Luo, Cheng Zhong, Zhongchao Shi, Yang Zhang, Jianping Fan, Zhiqiang He

International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Under review

All-Around Real Label Supervision: Cyclic Prototype Consistency Learning for Semi-supervised Medical Image Segmentation

Zhe Xu, **Yixin Wang**, Donghuan Lu, Lequan Yu, Jiangpeng Yan, Jie Luo, Kai Ma, Yefeng Zheng and Raymond Kai-yu Tong

Medical Image Analysis (MedIA), IF=8.55, Under review

A Survey of Visual Transformers

Yang Liu, Yao Zhang, **Yixin Wang**, Feng Hou, Jin Yuan, Jiang Tian, Yang Zhang, Zhongchao Shi, Jianping Fan, Zhiqiang He

IEEE Transactions on Neural Networks and Learning Systems, IF=10.45, Under review

ACN: Adversarial Co-training Network for Brain Tumor Segmentation with Missing Modalities

Yixin Wang, Yang Liu, Zihao Lin, Jiang Tian, Zhongchao Shi, Yang Zhang, Jianping Fan, Zhiqiang He

International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), **Accept**, 2021

Noisy Labels are Treasure: Mean-Teacher-Assisted Confident Learning for Hepatic Vessel Segmentation

Zhe Xu, Donghuan Lu, **Yixin Wang**, Jie Luo, Jayender Jagadeesan, Kai Ma, Yefeng Zheng, Xiu Li

International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), **Early accept**, 2021

Double-Uncertainty Weighted Method for Semi-supervised Learning

Yixin Wang, Yao Zhang, Jiang Tian, Cheng Zhong, Zhongchao Shi, Yang Zhang, Zhiqiang He

International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), **Oral Presentation**, 2020

Modality-Pairing Learning for Brain Tumor Segmentation

Yixin Wang, Yao Zhang, Feng Hou, Yang Liu, Jiang Tian, Cheng Zhong, Yang Zhang, Zhiqiang He

MICCAI Workshop (BrainLes), **Oral Presentation**, 2020

Semi-supervised Cardiac Image Segmentation via Label Propagation and Style Transfer

Yao Zhang, Jiawei Yang, Feng Hou, Yang Liu, **Yixin Wang**, Jiang Tian, Cheng Zhong, Zhiqiang He

Satellite Event at MICCAI (M&Ms), **Oral Presentation**, 2020

Cascaded Volumetric Convolutional Network for Kidney Tumor Segmentation from CT volumes

Yao Zhang, **Yixin Wang**, Feng Hou, Jiawei Yang, Guangwei Xiong, Jiang Tian, Cheng Zhong

Satellite Event at MICCAI (KiTS), **Oral Presentation**, 2019

FGB: Feature Guidance Branch for Organ Detection in Medical Images

Yixin Wang, Yao Zhang, Li Liu, Cheng Zhong, Jiang Tian, Yang Zhang, Zhongchao Shi, Zhiqiang He

IEEE 17th International Symposium on Biomedical Imaging (ISBI), 2020

Does Non-COVID19 Lung Lesion Help? Investigating Transferability in COVID-19 CT Image Segmentation

Yixin Wang, Yao Zhang, Yang Liu, Jiang Tian, Cheng Zhong, Zhongchao Shi, Yang Zhang, Zhiqiang He

Computer Methods and Programs in Biomedicine (CMPB), IF=5.43, 2021

Towards Data-Efficient Learning: A Benchmark for COVID-19 CT Lung and Infection Segmentation

Jun Ma, **Yixin Wang**, Xingle An, Cheng Ge, Ziqi Yu, Jianan Chen, Qiongjie Zhu, Guoqiang Dong, Jian He, Zhiqiang He, Ziwei Nie, Xiaoping Yang

Medical Physics (MP), IF=4.071, 2020

How Distance Transform Maps Boost Segmentation CNNs: An Empirical Study

Jun Ma, Zhan Wei, Yiwen Zhang, **Yixin Wang**, Rongfei Lv, Cheng Zhu, Gaoxiang Chen, Jianan Liu, Chao Peng, Lei Wang, Yunpeng Wang, Jianan Chene

Medical Imaging with Deep Learning (MIDL), 2020

The state of the art in kidney and kidney tumor segmentation in contrast-enhanced ct imaging: Results of the kits19 challenge

Nicholas Heller, Fabian Isensee, Klaus H. Maier-Hein, Xiaoshuai Hou, Chunmei Xie, Fengyi Li, Yang Nan, Guangrui Mu, Zhiyong Lin, Miofei Han, Guang Yao, Yaozong Gao, Yao Zhang, **Yixin Wang**, Feng Hou, Jiawei Yang, Guangwei Xiong, Jiang Tian, Cheng Zhong, Jun Ma, Jack Rickman, Joshua Dean, Bethany Stai, Resha Tejpal, Makinna Oestreich, Paul Blake, Heather Kaluzniak, Shaneabbas Raza, Joel Rosenberg, Keenan Moore, Edward Walczak, Zachary Rengel, Zach Edgerton, Ranveer Vasdev, Matthew Peterson, Sean McSweeney, Sarah Peterson, Arveen Kalapara, Niranjan Sathianathan, Nikolaos Papanikolopoulos, and Christopher Weight

Medical Image Analysis (MedIA), IF=8.55, 2019

AFSMA: an enhanced artificial fish swarm algorithm based on mutuality for community detection

Yixin Wang, Wanyue Xu, Qinma Kang

Proceedings of the 2nd International Conference on Big Data Research (ICBDR), 2018

[PATENT] A method, device for image processing.

Yixin Wang, Jiang Tian

CN113160230A, 2021

[PATENT] A method, equipment, and electronic device for organ detection.

Yixin Wang, Yao Zhang, Li Liu, Cheng Zhong, Jiang Tian

CN111598882A, 2020

[PATENT] A solar desalination system with constant effluent temperature.

Chunsheng Guo, Xianbo Nian, **Yixin Wang**, Zetian Mao, Yaohua Li, Chaojie Zhuo, Yongda Zhang, Jie Ren

CN108298623A, 2018

Projects

ProstateMMM: A large-scale multi-center, multi-sequence and multi-modality prostate dataset for domain adaptation (On Going)

2021

Domain gap is one of the obstacles that hinder the wide clinical adoption of deep learning-based medical image segmentation models. We are curating a versatile multi-site, multi-sequence, and multi-modality prostate segmentation dataset, termed ProstateMMM, including 960 annotated 3D scans from 11 medical centers, which is remarkably larger and has a greater variety than existing domain adaptation benchmark datasets. We plan to set up an online platform to hold our dataset and participants can directly evaluate their domain adaptation methods and compare with others.

MICCAI 2020 Brain Tumor Segmentation (BraTS) Challenge, Second place

2020

BraTS has always been focusing on the evaluation of state-of-the-art methods for the segmentation of brain tumors in multi-modal magnetic resonance imaging (MRI) scans. Our team proposed a novel end-to-end Modality-Pairing learning method and was ranked within **top 2** performing ones. I served as the team leader and was invited to present our work in MICCAI 2020 BrainLes workshop.

Towards Data-Efficient Learning: A Benchmark for COVID-19 CT Lung and Infection Segmentation

2020

Accurate segmentation of lung and infection in COVID-19 CT scans plays an important role in the quantitative management of patients. We released a COVID-19 3D CT **dataset** with 20 cases that contains 1800+ annotated slices. We also set up three benchmarks to explore annotation-efficient methods for COVID-19 CT scans segmentation. We provided 40+ trained 3D U-Net baseline **models** for COVID-19 CT Lung and Infection. There have been nearly **30,000** downloads.

MICCAI 2020 Multi-Centre, Multi-Vendor & Multi-Disease Cardiac Image Segmentation (M&Ms) Challenge, Second place

2020

The M&Ms challenge aims to contribute to the effort of building generalisable models that can be applied consistently across clinical centres and to accurately segment cardiac structures in magnetic resonance imaging. Our team proposed a semi-supervised manner via label propagation and style transfer to tackle the problem of unseen datasets acquired from distinct MRI scanners or clinical centres. Our team won **the 2nd place** and was invited to present our method in MICCAI 2020 conference.

MICCAI 2019 Kidney and Tumor Segmentation (KiTS) challenge, Fourth place

2019

The goal of this challenge is to accelerate the development of reliable kidney and kidney tumor semantic segmentation methodologies. Our team proposed a two-stage framework for kidney and tumor segmentation based on 3D fully convolutional network (FCN) and was ranked within **top 4** performing ones. We were invited to present our method in MICCAI 2019 conference.

2019 Skin Lesion Analysis Towards Melanoma Detection (ISIC) Challenge

2019

The goal for ISIC 2019 is to classify dermoscopic images among nine different diagnostic categories. We applied various data augmentation algorithms and uniform sampling for batching to deal with imbalanced class problem. In order to identify the outlier class, we borrowed the idea from metric learning and used Additive Margin Softmax (AM-Softmax) as the loss function in our convolutional neural networks(CNN).

Automatic Liver Vessel Extraction from CT Images

2019

We worked with PLA General Hospital to realize automatic liver vessel segmentation to aid clinical treatment. The goal is to extract main liver vessels from CT images. We used Faster R-CNN for detection, U-Net for segmentation and other computer vision techniques. This project was awarded **Outstanding Graduate Thesis** of Shandong University (SDU).

Honors & Awards

2022	School of Engineering Fellowship, Stanford University	Stanford
2022	Presidential Scholarship (Highest personal honor of Chinese Academy of Sciences)	CAS
2022	Outstanding Graduate	UCAS
2021	National Scholarship (top 1%)	National
2021	First class Academic Scholarship (top 5%)	UCAS
2021	Dean's Award (top 3%)	UCAS
2020	MICCAI BraTS Challenge 2 nd Place	MICCAI
2020	MICCAI M&Ms Challenge 2 nd Place	MICCAI
2020	Merit student	UCAS
2019	MICCAI KiTS Challenge 4 th Place	MICCAI
2019	Principal's Scholarship (Highest personal honor of SDU)	SDU
2019	Top 10 University Students	SDU
2019	Outstanding Graduate of Shandong Province	Shandong
2019	Outstanding Graduate of Shandong University	SDU
2019	Outstanding Graduate Thesis of Shandong University	SDU
2018	Outstanding Student Cadre of Shandong Province	Shandong
2015-2018	National Scholarship (top 1%) (Each year)	National
2015-2018	Undergraduate Scholarships (Each semester), Merit student	SDU
2017	Jicheng Innovation Scholarship	SDU
2017	International "Mathematical Contest in Modeling" Honorable prize	International
2017	the 15th "Challenge Cup" National College Student Curricular Academic Science and Technology Works Competition First prize	National
2017	"Discovery Cup" Software Design Competition Third prize	National

Academic Services

Conference

Conference on Information and Knowledge Management (CIKM), 2023
International Conference on Computer Vision (ICCV), 2021, 2023
International Conference on Machine Learning (ICML), 2021, 2022, 2023
The British Machine Vision Conference (BMVC), 2021
Medical Image Computing and Computer Assisted Intervention (MICCAI), 2021, 2022, 2023
International Conference on Learning Representations (ICLR), 2023

Journal

IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
Transactions on Intelligent Systems and Technology (TIST)
IEEE Transactions on Automation Science and Engineering

Main Courses

Master

Computer Vision, Deep Learning, Matrix Analysis and Application, Digital Image Processing, Pattern Recognition and Machine Learning, Advanced Artificial Intelligence, Information Retrieval for Computer Science, Strategy and Policy of Science & Technology, The Management and Application of Research Data, Engineering Ethics

Undergraduate

Advanced Mathematics, Discrete Mathematics, Linear Algebra, Probability and Mathematical Statistics, Mathematical Modeling, Linux Applications, Data Structure, Database System, Software Engineering, Advanced Programming Language, Operating System, Computer Networks, Computer Graphics.

Personal skills

Programming Python, C, C++, C#

Deep Learning Libraries Pytorch, Tensorflow, Keras

Languages Chinese, English

Other Leadership, Organization, Communication, Cooperation