



## Xi Wang

Postdoctoral Scholar, Radiation Physics

### Bio

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#### BIO

My research interests cover medical image analysis and deep learning, with special emphasis on weakly supervised learning. Specifically, I am dedicated to designing deep weakly supervised learning algorithms by leveraging coarse labeled unlabeled medical data, including gigapixel whole slide image classification, volumetric optical coherence tomography image analysis, and semi-supervised medical image classification. Currently, I mainly focus on improving the prediction performance of the immunotherapy response by using very limited pre-treatment multi-modality data.

#### HONORS AND AWARDS

- China National Scholarship, Ministry of Education of the People's Republic of China (2010)
- China National Encouragement Scholarship, Ministry of Education of the People's Republic of China (2011)
- China National Scholarship, Ministry of Education of the People's Republic of China (2012)
- Graduate Studentship, Sichuan University (2013-2016)
- Champion, Abnormalities Detection (Endoscopic Vision Challenge in MICCAI'15), MICCAI'15 (2015)
- Champion, Intervertebral Disc localization (Intervertebral Disc Localization Challenge in MICCAI'15), MICCAI'15 (2015)
- Best Paper Award, International Conference on Medical Imaging and Virtual Reality (MIAR) (2016)
- Ph.D. Studentship, The Chinese University of Hong Kong (2016-2020)
- Excellent Teaching Assistant (3 times), Department of Computer Science and Engineering, The Chinese University of Hong Kong (2018-2019)
- Student Travel Award, The first MIDL Conference (2019)
- 2nd Prize of Best Free Paper, The first APOIS Meeting (2020)
- Student Travel Award, The first APOIS Meeting (2020)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Reviewer, Medical Image Computing and Computer Assisted Intervention (2020 - present)
- Reviewer, IEEE Transactions on Cybernetics (2020 - present)
- Reviewer, IEEE Transactions on Medical Imaging (2020 - present)
- Reviewer, Medical Image Analysis (2020 - present)
- Reviewer, IEEE Journal of Biomedical and Health Informatics (2020 - present)
- Reviewer, Scientific Reports (2020 - present)
- Reviewer, World Journal of Radiology (2021 - present)
- Reviewer, International Journal of Intelligent Systems (2021 - present)

- Reviewer, Artificial Intelligence In Medicine (2021 - present)
- Reviewer, IEEE Access (2021 - present)
- Reviewer, IEEE Transactions on Multimedia (2021 - present)
- Meta-reviewer, 26th UK Conference on Medical Image Understanding and Analysis (2022 - present)
- Review Editor, Frontiers in Artificial Intelligence (2022 - present)
- Reviewer, Computers & Graphics (2022 - present)
- Reviewer, Applied Sciences (2022 - present)
- Reviewer, BMC Medical Imaging (2022 - present)
- Reviewer, Frontiers in Radiology (2022 - present)
- Reviewer, Sensors (2022 - present)
- Reviewer, Frontiers in Oncology (2022 - present)
- Reviewer, Frontiers in Physics (2022 - present)
- Reviewer, Electronics (2022 - present)

## PROFESSIONAL EDUCATION

- Doctor of Philosophy, Chinese University of Hong Kong (2020)
- Master of Science, Sichuan University (2016)
- Bachelor of Engineering, Southwest University (2013)
- Bachelor, Southwest University , Software Engineering (2013)
- Master, Sichuan University , Computer Science and Technology (2016)
- Ph.D., The Chinese University of Hong Kong , Computer Science and Engineering (2020)

## STANFORD ADVISORS

- Ruijiang Li, Postdoctoral Faculty Sponsor

## PATENTS

- Xi Wang. "United States Patent 202210321271.1 A Percolation-based Evolutionary Method for Diffusion Source Localization in Large Networks", Yang Liu, Xiaoqi Chen, Zhen Wang, Xi Wang, Xuelong Li, Mar 30, 2022
- Yang Liu, Guangbo Liang, Zhen Wang, Xi Wang, Chao Gao, Xuelong Li. "United States Patent 202210024022.6 A Method Based on Graph Partition to Suppress Diffusions on Complex Networks", Jan 11, 2022
- Yang Liu, Xiaoqi Chen, Zhen Wang, Xi Wang, Xuelong Li.. "China P.Rep. Patent 202111518210.6 A Bounded-Percolation Greedy Method for Epidemic Containment on Complex Networks", Dec 14, 2021

## LINKS

- My Google Scholar Profile: <https://scholar.google.com/citations?user=wWFM9CgAAAAJ&hl=en>
- My homepage: <https://vancywx.github.io/>

## Research & Scholarship

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### RESEARCH INTERESTS

- Professional Development
- Teachers and Teaching

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Multi-modal deep learning for precision oncology

## PROJECTS

- Immunotherapy treatment response prediction for gastric cancer using semi-supervised multi-modal deep learning - Stanford University (1/3/2022 - 12/31/2022)

## LAB AFFILIATIONS

- Ruijiang Li, Li's Lab (1/3/2022 - - 1/2/2024)

## Publications

### PUBLICATIONS

- **Deep semi-supervised multiple instance learning with self-correction for DME classification from OCT images.** *Medical image analysis*  
Wang, X., Tang, F., Chen, H., Cheung, C. Y., Heng, P.  
2022; 83: 102673
- **Three-Dimensional Multi-Task Deep Learning Model to Detect Glaucomatous Optic Neuropathy and Myopic Features From Optical Coherence Tomography Scans: A Retrospective Multi-Centre Study.** *Frontiers in medicine*  
Ran, A. R., Wang, X., Chan, P. P., Chan, N. C., Yip, W., Young, A. L., Wong, M. O., Yung, H. W., Chang, R. T., Mannil, S. S., Tham, Y. C., Cheng, C. Y., Chen, et al  
2022; 9: 860574
- **Federated Deep Learning for Classifying Glaucomatous Optic Neuropathy from Optical Coherence Tomography Volumetric Scans: A Privacy-preserving Multi-national Study**  
Ran, A., Wang, X., Chan, P. P., Chan, N. C., Wong, O., Yung, H., Chang, R. T., Mannil, S. S., Tham, Y., Cheng, C., Heng, P., Tham, C. C., Cheung, et al  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2022
- **Using Deep Learning for Assessing Image-Quality of 3D Macular Scans from Spectral-Domain Optical Coherence Tomography**  
Tang, Z., Wang, X., Ran, A., Tang, F., Cai, Y., Che, H., Yang, D., Luo, L., Liu, Q., Wong, Y., Chen, H., Heng, P., Cheung, et al  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2022
- **A Deep Learning System to Predict Response to Anti-Vascular Endothelial Growth Factor (VEGF) Therapy in Eyes with Diabetic Macular Edema for Optical Coherence Tomography Images**  
Tang, F., Wang, X., Cai, Y., Chen, H., Heng, P., Cheung, C. Y.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2022
- **Deep semi-supervised multiple instance learning with self-correction for DME classification from OCT images** *Medical image analysis*  
Wang, X., Tang, F., Chen, H., Cheung, C., Heng, P.  
2022
- **Detailed annotation improves deep learning generalization for interpretable chest radiograph diagnosis: A retrospective study** *Radiology*  
Luo, L., Chen, H., Xiao, Y., Zhou, Y., Wang, X., Vardhanabuthi, V., Wu, M., Han, C., Liu, Z., Lin, H., Heng, P.  
2022
- **A Multitask Deep-Learning System to Classify Diabetic Macular Edema for Different Optical Coherence Tomography Devices: A Multicenter Analysis.** *Diabetes care*  
Tang, F., Wang, X., Ran, A., Chan, C. K., Ho, M., Yip, W., Young, A. L., Lok, J., Szeto, S., Chan, J., Yip, F., Wong, R., Tang, et al  
2021
- **A Multi-Task Deep-Learning System to Classify Diabetic Macular Edema for Different Optical Coherence Tomography Devices: A Multi-Center Analysis**  
Cheung, C., Tang, F., Ran, A., Tan, G., Ting, D. W., Chen, H., Ma, H., Tang, S., Leng, T., Kakavand, S., Mannil, S. S., Chang, R., Liew, et al  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2021
- **Deep virtual adversarial self-training with consistency regularization for semi-supervised medical image classification** *MEDICAL IMAGE ANALYSIS*  
Wang, X., Chen, H., Xiang, H., Lin, H., Lin, X., Heng, P.  
2021; 70: 102010
- **Dual-path network with synergistic grouping loss and evidence driven risk stratification for whole slide cervical image analysis** *MEDICAL IMAGE ANALYSIS*  
Lin, H., Chen, H., Wang, X., Wang, Q., Wang, L., Heng, P.  
2021; 69: 101955

- **UD-MIL: Uncertainty-Driven Deep Multiple Instance Learning for OCT Image Classification** *IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS*  
Wang, X., Tang, F., Chen, H., Luo, L., Tang, Z., Ran, A., Cheung, C. Y., Heng, P.  
2020; 24 (12): 3431-3442
- **Deep Mining External Imperfect Data for Chest X-Ray Disease Screening.** *IEEE transactions on medical imaging*  
Luo, L., Yu, L., Chen, H., Liu, Q., Wang, X., Xu, J., Heng, P.  
2020; 39 (11): 3583–94
- **Weakly Supervised Deep Learning for Whole Slide Lung Cancer Image Analysis** *IEEE TRANSACTIONS ON CYBERNETICS*  
Wang, X., Chen, H., Gan, C., Lin, H., Dou, Q., Tsougenis, E., Huang, Q., Cai, M., Heng, P.  
2020; 50 (9): 3950-3962
- **Towards multi-center glaucoma OCT image screening with semi-supervised joint structure and function multi-task learning.** *Medical image analysis*  
Wang, X. n., Chen, H. n., Ran, A. R., Luo, L. n., Chan, P. P., Tham, C. C., Chang, R. T., Mannil, S. S., Cheung, C. Y., Heng, P. A.  
2020; 63: 101695
- **Framework of Evolutionary Algorithm for Investigation of Influential Nodes in Complex Networks** *IEEE TRANSACTIONS ON EVOLUTIONARY COMPUTATION*  
Liu, Y., Wang, X., Kurths, J.  
2019; 23 (6): 1049-1063
- **Detection of glaucomatous optic neuropathy with spectral-domain optical coherence tomography: a retrospective training and validation deep-learning analysis** *LANCET DIGITAL HEALTH*  
Ran, A., Cheung, C. Y., Wang, X., Chen, H., Luo, L., Chan, P. P., Wong, M. M., Chang, R. T., Mannil, S. S., Young, A. L., Yung, H., Pang, C., Heng, et al  
2019; 1 (4): E172–E182
- **Detection of glaucomatous optic neuropathy with spectral-domain optical coherence tomography: a retrospective training and validation deep-learning analysis.** *The Lancet. Digital health*  
Ran, A. R., Cheung, C. Y., Wang, X., Chen, H., Luo, L. Y., Chan, P. P., Wong, M. O., Chang, R. T., Mannil, S. S., Young, A. L., Yung, H. W., Pang, C. P., Heng, et al  
2019; 1 (4): e172-e182
- **A 3D Deep Learning System for Detecting Glaucomatous Optic Neuropathy from Volumetric and En Face Optical Coherence Tomography Scans**  
Ran, A., Wang, X., Luo, L., Chan, P., Chang, R., Mannil, S., Chen, H., Heng, P., Tham, C. Y., Cheung, C.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Unifying Structure Analysis and Surrogate-Driven Function Regression for Glaucoma OCT Image Screening**  
Wang, X., Chen, H., Luo, L., Ran, A., Chan, P. P., Tham, C. C., Cheung, C. Y., Heng, P., Shen, D., Liu, T., Peters, T. M., Staib, L. H., Essert, et al  
SPRINGER INTERNATIONAL PUBLISHING AG.2019: 39-47
- **Deep Angular Embedding and Feature Correlation Attention for Breast MRI Cancer Analysis**  
Luo, L., Chen, H., Wang, X., Dou, Q., Lin, H., Zhou, J., Li, G., Heng, P., Shen, D., Liu, T., Peters, T. M., Staib, L. H., Essert, et al  
SPRINGER INTERNATIONAL PUBLISHING AG.2019: 504-512
- **Optimization of targeted node set in complex networks under percolation and selection** *PHYSICAL REVIEW E*  
Liu, Y., Wang, X., Kurths, J.  
2018; 98 (1): 012313
- **AUTOMATED MITOSIS DETECTION WITH DEEP REGRESSION NETWORKS**  
Chen, H., Wang, X., Heng, P., IEEE  
IEEE.2016: 1204-1207
- **Mitosis Detection in Breast Cancer Histology Images via Deep Cascaded Networks**  
Chen, H., Dou, Q., Wang, X., Qin, J., Heng, P., AAAI  
ASSOC ADVANCEMENT ARTIFICIAL INTELLIGENCE.2016: 1160-1166
- **3D fully convolutional networks for intervertebral disc localization and segmentation** *International Conference on Medical Imaging and Augmented Reality*  
Chen, H., Dou, Q., Wang, X., Qin, J., Cheng, J., Heng, P.  
2016: 375–382

## **PRESENTATIONS**

- Deep Weakly Supervised Learning for Large-scale Medical Image Analysis - Tianjing University (10/14/2020 - 10/14/2020)