

SHUJUN WANG

Research Associate, Department of Applied Mathematics and Theoretical Physics, University of Cambridge

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WORK EXPERIENCE

University of Cambridge, United Kingdom May. 2022 – Present

Research Associate

Advisors: Prof. Carola-Bibiane Schönlieb (Department of Applied Mathematics and Theoretical Physics)
& Prof. Zoe Kourtzi (Department of Psychology)

The Chinese University of Hong Kong, Hong Kong Sep. 2021 – Apr. 2022

Postdoctoral Researcher, Department of Computer Science and Engineering

Advisor: Prof. Pheng-Ann Heng

EDUCATION

The Chinese University of Hong Kong (CUHK), Hong Kong Aug. 2017 – Jul. 2021

Ph.D., Department of Computer Science and Engineering

Supervisors: Prof. Pheng-Ann Heng & Prof. Chi-Wing Fu

Northwestern Polytechnical University (NPU), Xi'an, China Sep. 2013 – Jun. 2017

B.Eng., Honors College, Computer Science and Engineering

RESEARCH INTERESTS

Medical Image Analysis, Deep Learning, Multi-modal Learning, Biomedical Data Science, Digital Health, AI in Healthcare

My research interests focus on designing AI-driven computational methods to enable reliable medical decision-making for Precision Medicine, covering from disease diagnosis to prognosis, and from medical image computing to multi-modal biomedical data analysis. My current and future research will facilitate personalized prognosis and treatment with multi-modal biomedical data computing from both imaging and non-imaging information based on my existing research expertise on accurate and reliable machine learning-based disease diagnosis algorithms.

PUBLICATIONS (GOOGLE SCHOLAR)

Journal Papers

- [J6] A deep learning model for detection of Alzheimer's disease based on retinal photographs: a retrospective, multicentre case-control study
Carol Y Cheung*, An Ran Ran*, **Shujun Wang***, Victor T T Chan, Kaiser Sham, Saima Hilal, et al.
The Lancet Digital Health (**IF: 36.615**), 4(11), e806-e815, 2022. (* indicates equal contributions).
- [J5] Dual-Teacher++: Exploiting Intra-domain and Inter-domain Knowledge with Reliable Transfer for Cardiac Segmentation
Kang Li, **Shujun Wang**, Lequan Yu, and Pheng-Ann Heng.
IEEE Transactions on Medical Imaging (**TMI, IF: 11.037**), 40(10), pp. 2771 - 2782, 2021.
- [J4] DoFE: Domain-oriented Feature Embedding for Generalizable Fundus Image Segmentation on Unseen Datasets
Shujun Wang, Lequan Yu, Xin Yang, Kang Li, Chi-Wing Fu, and Pheng-Ann Heng.
IEEE Transactions on Medical Imaging (**TMI, IF: 11.037**), 39(12), pp. 4237-4248, 2020.
- [J3] RMDL: Recalibrated Multi-instance Deep Learning for Whole Slide Gastric Image Classification
Shujun Wang, Yaxi Zhu, Lequan Yu, Hao Chen, Huangjing Lin, Xiangbo Wan, Xinjuan Fan, and Pheng-Ann Heng
Medical Image Analysis (**MedIA, IF: 13.828**), 58, pp. 101549, 2019.
- [J2] Patch-based Output Space Adversarial Learning for Joint Optic Disc and Cup Segmentation
Shujun Wang, Lequan Yu, Xin Yang, Chi-Wing Fu, and Pheng-Ann Heng.
IEEE Transactions on Medical Imaging (**TMI, IF: 11.037**), 38(11), pp. 2485-2495, 2019.

- [J1] REFUGE Challenge: A Unified Framework for Evaluating Automated Methods for Glaucoma Assessment from Fundus Photographs
José Ignacio Orlando, Huazhu Fu, Pheng-Ann Heng, **Shujun Wang** et al.
Medical Image Analysis (**MedIA**, **IF: 13.828**), 59, pp. 101570, 2019.

Conference Papers

The conferences listed below are top-tier ones in medical image analysis and AI/Computer Vision (NeurIPS, AAAI, ECCV, MICCAI). The accepted rate of these conferences are around 20%-30%. NeurIPS, ECCV, and AAAI have very high h5-index of 278, 186, 180, respectively, according to the google scholar metrics: https://scholar.google.com/citations?view_op=top_venues.

- [C10] MulGT: Multi-task Graph-Transformer with Task-aware Knowledge Injection and Domain Knowledge-driven Pooling for Whole Slide Image Analysis
Weiqin Zhao, **Shujun Wang**, Maximus Yeung, Tianye Niu, and Lequan Yu.
Thirty-Seventh AAAI Conference on Artificial Intelligence (**AAAI**), 2023.
- [C9] Multi-task Learning-driven Volume and Slice Level Contrastive Learning for 3D Medical Image Classification
Jiayuan Zhu*, **Shujun Wang***, Jinzheng He, Carola-Bibiane Schönlieb, and Lequan Yu.
Computational Mathematics Modeling in Cancer Analysis (**CMMCA**) work at MICCAI 2022.
Best paper award (* indicates equal contributions)
- [C8] Multi-Granularity Cross-modal Alignment for Generalized Medical Visual Representation Learning
Fuying Wang, Yuyin Zhou, **Shujun Wang**, Varut Vardhanabhuti, Lequan Yu.
Conference on Neural Information Processing Systems (**NeurIPS**), 2022.
- [C7] Learning from Extrinsic and Intrinsic Supervisions for Domain Generalization
Shujun Wang, Lequan Yu, Caizi Li, Chi-Wing Fu, and Pheng-Ann Heng.
Proceedings of the European Conference on Computer Vision (**ECCV**), pp. 159-176, 2020.
- [C6] Dual-Teacher: Integrating Intra-domain and Inter-domain Teachers for Annotation-efficient Cardiac Segmentation
Kang Li, **Shujun Wang**, Lequan Yu, and Pheng-Ann Heng.
Medical Image Computing and Computer Assisted Intervention (**MICCAI**), pp. 418-427, 2020.
- [C5] Towards Cross-modality Medical Image Segmentation with Online Mutual Knowledge Distillation
Kang Li, Lequan Yu, **Shujun Wang**, and Pheng-Ann Heng.
AAAI Conference on Artificial Intelligence (**AAAI**), Vol. 34, No. 01, pp. 775-783, 2020.
- [C4] Boundary and Entropy-driven Adversarial Learning for Fundus Image Segmentation
Shujun Wang, Lequan Yu, Kang Li, Xin Yang, Chi-Wing Fu, and Pheng-Ann Heng.
Medical Image Computing and Computer Assisted Intervention (**MICCAI**), pp. 102-110, 2019.
- [C3] Uncertainty-Aware Self-ensembling Model for Semi-supervised 3D Left Atrium Segmentation
Lequan Yu, **Shujun Wang**, Xiaomeng Li, Chi-Wing Fu, and Pheng-Ann Heng.
Medical Image Computing and Computer Assisted Intervention (**MICCAI**), pp. 605-613, 2019.
- [C2] Agent with Warm Start and Active Termination for Plane Localization in 3D Ultrasound
Haoran Dou, Xin Yang, Jikuan Qian, Wufeng Xue, Lequan Yu, **Shujun Wang**, Pheng-Ann Heng et al.
Medical Image Computing and Computer Assisted Intervention (**MICCAI**), pp. 290-298, 2019. [**Oral**]
- [C1] Unsupervised Retina Image Synthesis via Disentangled Representation Learning
Kang Li, Lequan Yu, **Shujun Wang**, and Pheng-Ann Heng.
International Workshop on Simulation and Synthesis in Medical Imaging of MICCAI, pp. 32-41, 2019. [**Oral**]

Under Review

- [U4] ConSlide: Asynchronous Hierarchical Interaction Transformer with Breakup-Reorganize Rehearsal for Continual Whole Slide Image Analysis
Yanyan Huang, Weiqin Zhao, **Shujun Wang**, Yu Fu, Yuming Jiang, and Lequan Yu.
Submitted to The IEEE/CVF Computer Vision and Pattern Recognition Conference (**CVPR**), 2023.
- [U3] TrafficCAM: A Versatile Dataset for Traffic Flow Segmentation
Zhongying Deng, Yanqi Cheng, Lihao Liu, **Shujun Wang**, Christina Runkel, Rihuan Ke, Carola-Bibiane

Schönlieb, and Angelica I Aviles-Rivero.

Submitted to The IEEE/CVF Computer Vision and Pattern Recognition Conference (**CVPR**), 2023.

[U2] Geometry Point Transformer for Point Cloud Segmentation

Zhening Huang, Xiaoyang Wu, Hengshuang Zhao, Lei Zhu, **Shujun Wang**, Georgios M. Hadjidemetriou, Ioannis Brilakis.

Submitted to The IEEE/CVF Computer Vision and Pattern Recognition Conference (**CVPR**), 2023.

[U1] HCDG: A Hierarchical Consistency Framework for Domain Generalization on Medical Image Segmentation

Yijun Yang*, **Shujun Wang***, Lei Zhu, and Lequan Yu.

Submitted to Artificial Intelligence In Medicine, 2022. (* indicates equal contributions)

SELECTED AWARDS AND HONORS

Best Paper Award of CMMCA workshop at MICCAI 2022	2022
IEEE TMI Distinguished Reviewer Silver Level	2020-2022
CUHK Ph.D Scholarship	2017-2021
Second place, Detection and segmentation of optic disc (PALM challenge in ISBI'19)	2019
Champion, Optic Disc & Cup Segmentation (REFUGE challenge in MICCAI'18)	2018
Outstanding Graduates of Northwestern Polytechnical University	2017
The China National Aero-Technology Import & Export Corporation Special Scholarship (only 10 from NPU)	2016
National Scholarship of China (1.8 %)	2015
First-class Scholarship for Outstanding Students	2014, 2016
Excellent Student Awards (1.5 %)	2015

INVITED TALKS

1. Talk on “AI for Generalised Fundus Image Analysis”
at Department of Ophthalmology & Visual Sciences in CUHK, Nov. 2022
2. Talk on “Annotation-efficient Learning for Generalizable Biomedical Image Analysis”
at Hong Kong Applied Science and Technology Research Institute, May. 2021
3. Talk on “Deep model generalization for medical image analysis”
at VALSE forum, China, Jan. 2021

TEACHING & MENTORING EXPERIENCE

Teaching Assistant at CUHK:

ENGG 2020 Digital Logic and Systems	Fall 2019, Fall 2018, Fall 2017
CENG 2010 Digital Logic Design Laboratory	Spring 2019
ENGG 1110 Problem Solving by Programming	Spring 2018

Mentoring:

Kang Li (Postgraduate at CUHK), Xinrong Xu (Master student at CUHK), Yijun Yang (Undergraduate at SDU), Jiayuan Zhu (Undergraduate at XJTU), Yan Li (RA at CUHK)

PROFESSIONAL ACTIVITIES

Conference Co-organizer and meta reviewer:

WiMIUA, July 2022 in Cambridge, UK

Meta reviewer for Medical Image Understanding and Analysis 2022

Journal Reviews:

International Journal of Computer Vision

IEEE Transactions on Neural Networks and Learning Systems

IEEE Transactions on Medical Imaging

IEEE Journal of Biomedical and Health Informatics

Medical Image Analysis

Artificial Intelligence in Medicine

Conference Reviews:

Medical Image Computing and Computer Assisted Intervention (MICCAI 2020, 2021, 2022)
IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2023)
AAAI Conference on Artificial Intelligence (AAAI 2021, 2022, 2023)
IEEE International Conference on Computer Vision (ICCV 2021)

LIST OF REFEREES

1. Prof. Pheng-Ann Heng (pheng@cse.cuhk.edu.hk) [My PhD supervisor]
Professor, Department of Computer Science and Engineering
Director of Institute of Medical Intelligence and XR
Director of Virtual Reality, Visualization and Imaging Research Center
The Chinese University of Hong Kong
2. Prof. Carola-Bibiane Schönlieb (cbs31@cam.ac.uk) [My PostDoc Advisor]
Professor, Department of Applied Mathematics and Theoretical Physics
Director of the EPSRC Centre for Mathematical and Statistical Analysis of Multimodal Clinical Imaging
Director of the Cantab Capital Institute for Mathematics of Information
University of Cambridge
3. Prof. Chi-Wing Fu (cwfu@cse.cuhk.edu.hk) [My PhD co-supervisor]
Professor, Department of Computer Science and Engineering
Associate Dean (Student Affairs), Faculty of Engineering
The Chinese University of Hong Kong
4. Prof. Carol YL CHEUNG (carolcheung@cuhk.edu.hk) [My Collaborator at Medical School]
Associate Professor, Department of Ophthalmology and Visual Sciences
The Chinese University of Hong Kong