Zhihua Liu

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+44(0)7421319091 | zliu7@ed.ac.uk | zhihualiued.github.io | Postdoc @ Causality in Healthcare AI Hub

Research Interests: Medical Imaging | CV/ML | Causal Representation Learning | AI4Healthcare

Educations

University of Leicester, UK *09/2018 –12/2024*
- M.Phil., Ph.D. in Computer Science, Biomedical Image Processing Lab (BIPL).
- Supervisor: Prof. Huiyu Zhou, Prof. Bin Yang.

University of Edinburgh, UK *09/2015 –11/2016*
- MSc in Artificial Intelligence, School of Informatics.

University of Science and Technology Beijing, China *09/2011 –06/2015*
- BEng of Internet of Things, School of Computer Science and Communication Engineering.
- Supervisor: Prof. Stephen McKenna, Prof. JianGuo Zhang, Dr. Sebastian Stein (University of Dundee)
- Major GPA: 3.56/4.0, Overall GPA: 3.21/4.0

Working Experience

PostDoc Research Associate, School of Engineering, University of Edinburgh *05/2025 - 05/2027 (Expected)*
Line Manager: Prof. Sotirios A. Tsaftaris *Usher Building, BioQuarter, Edinburgh*
- Research focus on causal representation learning for precision healthcare applications

Research Intern, AstraZeneca, Center for Artificial Intelligence *05/2024 - 08/2024*
Line Manager: Dr. Chen Jin, Mr. Philip Teare *Discovery Center, Cambridge, UK*
- Visual prompt learning for reference image segmentation with concept decomposition.

Algorithm Engineer, JD.COM *09/2016 - 09/2018*
Line Manager: Dr. Yanli Li *Beijing, China*
- Research works on car, pedestrian and cyclist detection in 3D Point Clouds generated from LiDAR.
- Point cloud interactive labeling tool development with PyQT and VTK.

Research Projects

Deep Medical Image Analysis from Low-Resource Shape Coding *11/2024*
Ph.D. Thesis
- Low-resource computational anatomy framework learning token, motion and multimodal representations.

Medical Image Analysis Based on Deep Relational Learning *09/2020*
M.Phil. Thesis
- Glioma context modeling with feature relational learning on accurate sub-region semantic segmentation.
- Spatial correlation modeling with query-key-value relation learning on fetoscopy image mosaicking.

Multi-Classes Training and Testing in Food Preparation Recognition Tasks *06/20215*
B.Eng. Thesis
- Multi-Sensor data collection and processing from egocentric food preparation.
- Time-series vision behavior classification based on SVM and Hidden Markov Model

Teaching Experience

Graduate Teaching Assistant *12/2020 - 12/2023*
University of Leicester
- CO4105 Advanced C++ Programming - Lab Session
- CO3002 Analysis and Design of Algorithms - Tutorial Session

Lab Demonstrator *09/2019 - 05/2020*
University of Leicester
- FS0023 STEM Foundation Year Lab - Physics Lab

Publications

Google Scholar: https://scholar.google.com/citations?user=je2KXVYAAAAJ&hl=en

Pre-Prints

[PP1] **BOTM: Echocardiography Segmentation via Bi-directional Optimal Token Matchings**
Zhihua Liu, Lei Tong, Xilin He, Che Liu, Rossella Arcucci, Chen Jin, Huiyu Zhou
Pre-print. Under Review

Peer-reviewed Conference and Journal Publications

[P7] **Segment anyword: Mask prompt inversion for open-set grounded segmentation**
Zhihua Liu, Amrutha Saseendran, Lei Tong, Xilin He, Fariba Yousefi, Nikolay Burlutskiy, Dino Oglic, Tom Diethe, Philip Teare, Huiyu Zhou, Chen Jin
ICML 2024. Work was done during research intern at AstraZeneca Cambridge Center for AI

[P6] **Long-Short Diffeomorphism Memory Network for Weakly-Supervised Ultrasound Landmark Tracking**
Zhihua Liu, Bin Yang, Yan Shen, Xuejun Ni, Sotirios A. Tsaftarise, Huiyu Zhou
MedIA Medical Image Analysis, 2024

[P5] **Deep Learning Based Brain Tumor Segmentation: A Survey**
Zhihua Liu, Lei Tong, Zheheng Jiang, Long Chen, Feixiang Zhou, Qianni Zhang, Xiangrong Zhang, Yaochu Jin, Huiyu Zhou
CAIS Complex & Intelligent Systems, 2022

[P4] **Detecting and Tracking of Multiple Mice Using Part Proposal Networks**
Zheheng Jiang, **Zhihua Liu**, Long Chen, Lei Tong, Xiangrong Zhang, Xiangyuan Lan, Danny Crookes, Ming-Hsuan Yang, Huiyu Zhou
TNNLS IEEE Transactions on Neural Networks and Learning Systems, 2022

[P3] **Cost-sensitive Boosting Pruning Trees for Depression Detection on Twitter**
Lei Tong, **Zhihua Liu**, Zheheng Jiang, Feixiang Zhou, Long Chen, Jialin Lyu, Xiangrong Zhang, Qianni Zhang, Abdul Sadka, Yinhai Wang, Ling Li, Huiyu Zhou
TAE IEEE Transactions on Affective Computing, 2022

[P2] **CANet: Context Aware Network for Brain Glioma Segmentation**
Zhihua Liu, Lei Tong, Long Chen, Feixiang Zhou, Zheheng Jiang, Qianni Zhang, Yinhai Wang, Caifeng Shan, Ling Li, Huiyu Zhou
TMI IEEE Transactions on Medical Imaging, 2021

[P1] **Underwater Object Detection using Invert Multi-Class Adaboost with Deep Learning**
Long Chen, **Zhihua Liu**, Lei Tong, Zheheng Jiang, Shengke Wang, Junyu Dong, Huiyu Zhou
IJCNN, 2020

Professional Service

Conference Reviewer
- BMVC (2019-2023, 2025), ACCV (2020, 2024), WACV (2022), ECCV (2022, 2024), CVPR (2020, 2023, 2024), ICCV (2021, 2023, 2025)

Journal Reviewer
- IEEE Transactions on Medical Imaging (**Distinguished Reviewer 2024**)
- IEEE Journal of Biomedical and Health Informatics
- Medical Physics
- IEEE Transactions on Human-Machine Systems

Workshop Organizer
- Leicester AIDAM Winter AI Workshop (2019, 2022)

Skills

Programming	Python, C/C++, Matlab, CMake, Git, Scripting (Bash), LaTeX, HTML, Vim
Computer Vision	OpenCV, Point Cloud Library, PyTorch3D, Detectron
Software	Linux, Pytorch, Jax
Language	English, Chinese

References

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