

Zhihua Liu

Usher Building, 5-7 Little France Road, Edinburgh BioQuarter - Gate 3

☎ +44(0)7421319091 | ✉ zliu7@ed.ac.uk | 🏠 zhihualiu7.github.io | 📧 Postdoc @ Causality in Healthcare AI Hub

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

Educations

University of Leicester, UK

01/2021 – 02/2025

- Ph.D. in Computer Science, Biomedical Image Processing Lab (BIPL).
- Supervisor: Prof. Huiyu Zhou, Prof. Bin Yang.

University of Leicester, UK

09/2018 – 01/2021

- M.Phil. in Computer Science, Biomedical Image Processing Lab (BIPL).
- Supervisor: Prof. Huiyu Zhou

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, 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 healthcare AI

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 open vocabulary image segmentation.

Algorithm Engineer, JD.COM

09/2016 - 09/2018

Line Manager: Dr. Yanli Li

Beijing, China

- Object detection in 3D point clouds.

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-sensors 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

Selected Publications

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

Pre-Prints

- [PP1] **A Causal Framework for Mitigating Data Shifts in Healthcare**
Kurt Butler, Stephanie Riley, Damian Machlanski, Edward Moroshko, Panagiotis Dimitrakopoulos, Thomas Melistas, Akchunya Chanchal, Konstantinos Vilouras, **Zhihua Liu**, Steven McDonagh, Hana Chockler, Ben Glocker, Niccolo Tempini, Matthew Sperrin, Sotirios A Tsaftaris, Ricardo Silva
Pre-print. npj Digital Medicine Under Review

Peer-reviewed Conference and Journal Publications

- [P10] **Causal Adapter: Taming Text-to-Image Diffusion for Counterfactual Generation**
Tong Lei*, **Zhihua Liu***, Chaochao Lu, Tom Diethe, Philip Teare, Sotirios A. Tsaftaris, Chen Jin
ICML 2026
- [P9] **Towards Adapting Vision-Language Models for Semi-Supervised Domain Generalization**
Xilin He, Xiaole Xian, **Zhihua Liu**, Weicheng Xie, Xiangyu yue, Muhammad Haris Khan
IJCNN 2026
- [P8] **BOTM: Echocardiography Segmentation via Bi-directional Optimal Token Matchings**
Zhihua Liu, Lei Tong, Xilin He, Che Liu, Rossella Arcucci, Chen Jin, Huiyu Zhou
BMVC 2025
- [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 2025. 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. Tsaftaris, 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, ACCV, WACV, ECCV, CVPR, ICCV, MIDL

Journal Reviewer

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

Program Chair

- MedEurlPS: Medical Imaging meets EurlPS (NeurIPS 2025)
- 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

Sotirios A. Tsafaris

Professor

School of Engineering, the University of Edinburgh

Canon Medical/Royal Academy of Engineering Research Chair in Healthcare AI

Turing Fellow, the Alan Turing Institute, ELLIS Fellow

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Huiyu Zhou

Professor

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Jin Chen

Associate Principal AI Scientist

AstraZeneca, Center for Artificial Intelligence

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Bin Yang

Professor

Department of Cardiovascular Sciences, University of Leicester

University Hospitals of Leicester NHS Trust

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Tel: 44-01162231046

Stephen McKenna

Professor

Computing, School of Science and Engineering, University of Dundee

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