

Xinzhe Luo

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EDUCATION

School of Data Science, Fudan University

Ph.D. in Statistics

Shanghai, China

Sep 2019 – Jun 2024

School of Mathematical Sciences, Fudan University

B.S. in Mathematics

Shanghai, China

Sep 2015 – Jun 2019

RESEARCH EXPERIENCE

Imperial College London

Postdoctoral Research Associate, Advisor: Dr. Chen Qin and Dr. Yingzhen Li

London, United Kingdom

June 2024 – Present

- Developing trustworthy AI systems for MRI reconstruction and general inverse problems. Research interests include generative models, inverse problems, uncertainty quantification, and robustness evaluation.

Fudan University

Ph.D. Student, Advisor: Prof. Xiahai Zhuang

Shanghai, China

Sep 2019 – Jun 2024

- Developed statistical modelling and machine learning techniques to achieve multi-modal groupwise image analysis, including groupwise registration and combined computing of cardiac, brain, and abdominal medical images.

SELECTED PUBLICATIONS

Image Reconstruction and Inverse Problems

- Xinzhe Luo**, Yingzhen Li, and Chen Qin. "Unsupervised Accelerated MRI Reconstruction via Ground-Truth-Free Flow Matching." *International Conference on Information Processing in Medical Imaging* (IPMI 2025, Oral Presentation).

Multi-modal Groupwise Registration and Combined Computing

- Xinzhe Luo***, Xin Wang*, Linda Shapiro, Chun Yuan, Jianfeng Feng, and Xiahai Zhuang. "Bayesian Unsupervised Disentanglement of Anatomy and Geometry for Deep Groupwise Image Registration." *arXiv preprint arXiv: 2401.02141* (Under review by IEEE TPAMI).
- Xin Wang*, **Xinzhe Luo***, and Xiahai Zhuang. "BInGo: Bayesian Intrinsic Groupwise Registration via Explicit Hierarchical Disentanglement." *International Conference on Information Processing in Medical Imaging* (IPMI 2023, Oral Presentation).
- Xinzhe Luo** and Xiahai Zhuang. " \mathcal{X} -Metric: An N-Dimensional Information-Theoretic Framework for Groupwise Registration and Deep Combined Computing." *IEEE Transactions on Pattern Analysis and Machine Intelligence* 45 (2023): 9206-9224.
- Xinzhe Luo** and Xiahai Zhuang. "MvMM-RegNet: A new image registration framework based on multivariate mixture model and neural network estimation." *International Conference on Medical Image Computing and Computer-Assisted Intervention* (MICCAI 2020, Oral Presentation).

Medical Image Segmentation

- Qian Yue, **Xinzhe Luo**, Qing Ye, Lingchao Xu, and Xiahai Zhuang: "Cardiac segmentation from LGE MRI using deep neural network incorporating shape and spatial priors." *International Conference on Medical Image Computing and Computer-Assisted Intervention* (MICCAI 2019).

Challenge Benchmarks

- Xiahai Zhuang, Jiahang Xu, **Xinzhe Luo**, ..., Lei Li: "Cardiac segmentation on late gadolinium enhancement MRI: a benchmark study from multi-sequence cardiac MR segmentation challenge." *Medical Image Analysis* 81 (2022): 102528.

INVITED TALKS

Unsupervised Accelerated MRI Reconstruction via Ground-Truth-Free Flow Matching Invited talk, United Imaging Healthcare, Houston, TX, USA. (Online)	Mar 2025
Tutorial on Generative Models for Inverse Problems Computational Statistics and Machine Learning reading group, Imperial College London.	Mar 2025
Uncertainty Quantification in Medical Imaging Guest lecture, Trustworthy Artificial Intelligence in Medical Imaging, Imperial College London.	Feb 2025
BInGo: Bayesian Intrinsic Groupwise Registration via Explicit Hierarchical Disentanglement Oral presentation, Information Processing in Medical Imaging, San Carlos de Bariloche, Argentina.	Jun 2023
Medical Image Registration: A Brief Introduction Guest lecture, Medical Image Analysis (postgrad), Fudan University.	Sep 2022
Mutual-Information Medical Image Registration: Theory and Examples Guest lecture, Medical Image Analysis (postgrad), Fudan University.	Dec 2021
Multivariate Mixture Model for Myocardial Segmentation Combining Multi-Source Images Guest lecture, Medical Image Analysis (postgrad), Fudan University.	Dec 2020
MvMM-RegNet: A New Image Registration Framework Based on Multivariate Mixture Model and Neural Network Estimation Oral presentation, Medical Image Computing and Computer Assisted Intervention, Lima, Peru. (Online)	Oct 2020
Medical Image Registration: Diffeomorphic Demons Guest lecture, Medical Image Analysis (postgrad), Fudan University.	Nov 2019

ACADEMIC SERVICES

JOURNAL REVIEW

- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- Pattern Recognition (PR)
- IEEE Transactions on Medical Imaging (TMI)
- Medical Image Analysis (MedIA)

CONFERENCE REVIEW

- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2023, 2024, 2025)

ORGANIZATION

- Multi-sequence Cardiac MR Segmentation Challenge (MS-CMRSeg 2019)
- Myocardial Pathology Segmentation Combining Multi-Sequence Cardiac Magnetic Resonance Images Challenge (MyoPS 2020)

AWARDS & ACHIEVEMENTS

Outstanding Ph.D. Graduate, Fudan University, 2024
IEEE TMI Distinguished Reviewer, IEEE Transactions on Medical Imaging, 2022-2023, 2023-2024
China National Scholarship, Ministry of Education, People's Republic of China, 2023
Honourable Mention for the Francois Erbsmann Prize, Information Processing in Medical Imaging 2023
China National Scholarship, Ministry of Education, People's Republic of China, 2020

MISCELLANEOUS

SKILLS

Programming: Python, PyTorch, TensorFlow
Techniques: Bayesian statistics, Probabilistic graphical model, Image registration, Representation learning
Languages: Chinese (Native), English (Professional)