

# Xinzhe Luo

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## EDUCATION

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**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

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**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

- Thesis: Multi-Modality Medical Image Groupwise Combined Computing Based on Explicit Modelling.
- 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

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### *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, joint first author).
- 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, joint first author)*.
- 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)*.

### *Image Registration and Segmentation*

- Bomin Wang\*, **Xinzhe Luo\***, and Xiahai Zhuang: "Toward Universal Medical Image Registration via Sharpness-Aware Meta-Continual Learning." *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2024, joint first author)*.
- 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

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

## ACADEMIC SERVICES

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### 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

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**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

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### SKILLS

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