

Zi LI

ALGORITHM ENGINEER

Alibaba DAMO Academy, Alibaba Xixi Park, Hangzhou, China

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Interested in Machine Learning for Medical Image Analysis.

Education

Dalian University of Technology (985/211)

Dalian, China

MASTER IN SOFTWARE ENGINEERING

Sep. 2019 - Jun. 2022

- Master Thesis: Deep Bilevel Optimization Learning for Medical Image Registration. Advised by [Xin Fan](#) and [Risheng Liu](#).
- Awarded *Excellent Master Dissertation Award of Liaoning Province* and *Outstanding Graduate of Liaoning Province*.
- First-class honors with average of 86.0%.

Dalian University of Technology (985/211)

Dalian, China

BACHELOR IN SOFTWARE ENGINEERING

Sep. 2015 - Jun. 2019

- Awarded the qualification for recommendation without examination for postgraduate studies with final average of 87.3%. First-class honors.

Experience

Alibaba DAMO Academy

Hangzhou, China

ALGORITHM ENGINEER. ADVISED BY [LE LU](#)

Jul. 2022 - Now

- Developed innovative solutions to address challenges in medical image registration across various fields of view and respiratory states, and cross-modality image registration, with high-quality publications such as *SAMConvex* (MICCAI 2023) and *MASR* (CVPR 2024).
- Led the CBCT-CT image synthesis and registration project and won first place in the MICCAI 2023 Learn2Reg Challenge: ThoraxCBCT.
- Involved in multi-modal (MRI-CT) segmentation of nasopharyngeal cancer GTV project.
- Involved in cardiac CMR project focusing on 2D/3D registration, optical flow, and segmentation.

Dalian University of Technology

Dalian, China

RESEARCH ASSISTANT

Sep. 2019 - Jun. 2022

- Introduced a generic optimization model to formulate diffeomorphic registration and developed a series of learnable architectures to obtain propagative updating in the coarse-to-fine feature space. Proposed a new bilevel self-tuned training strategy, allowing the efficient search of task-specific hyper-parameters. Published on *IEEE TPAMI* 2022.
- Devised an automated learning registration algorithm *AutoReg* (*IEEE TIP* 2023), that cooperatively optimizes both architectures and corresponding training objectives, enabling non-computer experts to find off-the-shelf registration algorithms for various scenarios conveniently.

Tencent AI Lab

Shenzhen, China

SUMMER RESEARCH INTERN

Jun. 2021 - Aug. 2021

- Involved in the pathology image registration project and established a baseline approach, which consists of feature-based affine registration, exhaustive initial alignment, iterative affine registration and deformable registration.

Honors & Awards

INTERNATIONAL

2023	Rank 1st place , Learn2Reg: 2023 MICCAI Registration Challenge	Vancouver, CA
2021	Student Travel Award , MICCAI	Virtual
2020	Coursera Certificate , Image and Video Processing of Duke University	Virtual
2018	Coursera Certificate , Deeplearning.ai	Virtual
2017	Coursera Certificate , Machine Learning of Stanford University	Virtual

DOMESTIC

2022	Excellent Master Dissertation Award , Liaoning Province	China
2022	Outstanding Graduate , Liaoning Province	China
2021	National Scholarship (top 0.2%) , Dalian University of Technology	Dalian, China
2021	Academic Star (top 10/20000+) , Dalian University of Technology	Dalian, China
2019	Merit Student , Dalian University of Technology	Dalian, China
2019	First Class Honors , Dalian University of Technology	Dalian, China

Academic Service

Journal

REVIEWER

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Journal of Biomedical and Health Informatics
- IEEE Transactions on Medical Imaging
- Neurocomputing

Conference

REVIEWER

- CVPR | MICCAI | AAAI | MIDL

Challenge

ORGANIZER

- OncoReg: Medical Image Registration for Oncological Challenges

Board

MEMBER

- MICCAI Special Interest Group in Biomedical Image Registration (SIG-BIR)

Selected Publications

CONFERENCE PROCEEDINGS

1. Tony C. W. Mok[†], **Zi Li[†]**, Yunhao Bai, *et al.* ([†] **Equal contribution**)
“Modality-agnostic structural image representation learning for deformable multi-modality medical image registration.”
IEEE Conference on Computer Vision and Pattern Recognition, 2024. [Highlight paper, **acceptance rate of 2.8%**]
2. **Zi Li[†]**, Lin Tian[†], Tony C. W. Mok, *et al.* ([†] **Equal contribution**)
“SAMConvex: Fast discrete optimization for CT registration using self-supervised anatomical embedding and correlation pyramid.”
Medical Image Computing and Computer Assisted Intervention, 2023.
3. Ziyang Li, **Zi Li**, *et al.*
“Coupling deep deformable registration with contextual refinement for semi-supervised medical image segmentation.”
IEEE 19th International Symposium on Biomedical Imaging (ISBI), 2022.
4. Risheng Liu, **Zi Li***, Yuxi Zhang, Xin Fan, *et al.* (* **First student author**)
“Bi-level Probabilistic Feature Learning for Deformable Image Registration.”
Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, 2020.

JOURNAL ARTICLES

5. Xin Fan[†], **Zi Li[†]**, Ziyang Li, *et al.* ([†] **Equal contribution**)
“Automated Learning for Deformable Medical Image Registration by Jointly Optimizing Network Architectures and Objective Functions.”
IEEE Transactions on Image Processing, 2023. [**Impact factor of 10.6**]
6. Risheng Liu, **Zi Li***, Xin Fan, *et al.* (* **First student author**)
“Learning Deformable Image Registration From Optimization: Perspective, Modules, Bilevel Training and Beyond.”
IEEE Transactions on Pattern Analysis Machine Intelligence, 2021. [**Impact factor of 23.6**]

PEER REVIEWED WORKSHOPS AND PREPRINTS

7. Tony C. W. Mok, **Zi Li**, *et al.*
“Deformable medical image registration under distribution shifts with neural instance optimization.”
The 14th International Workshop on Machine Learning in Medical Imaging (MLMI 2023), 2023. [**Oral Presentation**]
8. Lin Tian[†], **Zi Li[†]**, *et al.* ([†] **Equal contribution**)
“SAME++: A Self-supervised Anatomical eMbeddings Enhanced medical image registration framework.” 2023.
9. **Zi Li**, Ying Chen, *et al.*
“Deep Learning-based Multi-modality Model for Accurate Gross Tumor Volume Segmentation in Nasopharyngeal Carcinoma Radiotherapy.” 2024.

Skills

Programming

Python, JAVA, C++, LaTeX, PyTorch, TensorFlow

Languages

English Proficient | Japanese N2 | Chinese Mother-Tongue