Zi LI

Algorithm Engineer

Alibaba DAMO Academy, Alibaba Xixi Park, Hangzhou, China

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Interested in Machine Learning for Medical Image Analysis. Applying for a PhD :)

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 (Japanese Intensive) — *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.
- Led the multi-modal (MRI-CT) segmentation of nasopharyngeal cancer GTV project.
- Led the 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. Publicated 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

2024	**Highlight paper**, CVPR 2024	*Seattle, U.S.A*
2023	**Rank 1st place**, Learn2Reg: 2023 MICCAI Registration Challenge	*Vancouver, CA*
2021	**Student Travel Award**, MICCAI 2021	*Strasbourg, France*
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%)**, Ministry of Education of China	*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 and Conference

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
- CVPR | ICCV | MICCAI | AAAI | MIDL | WACV

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**†, *et al*. († **Equal first author**)
   "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†, *et al*. († **Equal first author**)
   "SAMConvex: Fast discrete optimization for CT registration using self-supervised anatomical embedding and correlation pyramid."
   Medical Image Computing and Computer Assisted Intervention, 2023.

3. Risheng Liu, **Zi Li***, *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

4. Xin Fan†, **Zi Li**†, *et al*. († **Equal first author**)
   "Automated Learning for Deformable Medical Image Registration by Jointly Optimizing Network Architectures and Objective Functions."
   IEEE Transactions on Image Processing, 2023. **[IF 10.6]**

5. Risheng Liu, **Zi Li***, *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. **[IF 23.6]**

Peer Reviewed Abstract and Preprints

6. **Zi Li**, Ying Chen, *et al*.
   "Deep Learning-based Multi-modality Model for Accurate Gross Tumor Volume Segmentation in Nasopharyngeal Carcinoma Radiotherapy." RSNA 2024.

7. Lin Tian†, **Zi Li**†, *et al*. († **Equal first author**)
   "SAME++: A Self-supervised Anatomical eMbeddings Enhanced medical image registration framework." 2024. IEEE Transactions on Image Processing (TIP) (Major Revision).

8. **Zi Li**, *et al*.
   "Leveraging Semantic Asymmetry for Precise Tumor Segmentation of Nasopharyngeal Carcinoma in Non-contrast CT Images." 2024.

9. **Zi Li**, *et al*.
   "Towards Universal Anatomical Model for Image Registration of 90 Whole-Body Organs in CT Imaging." 2025.

Patent

10. **Zi Li**, *et al*.
    "Image processing method, service providing method, apparatus, device, and storage medium." 2024.

11. **Zi Li**, *et al*.
    "Image registration method, electronic device, and computer-readable storage medium." 2024.

Skills

Languages English Proficient | Japanese N2 | Chinese Mother-Tongue