Xin You

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Education Experiences

- **Shanghai Jiao Tong University (SJTU)** Shanghai · China Sep. 2020 – Sep. 2026 (expected)
  Direct Ph.D. program
  - Affiliated with Institute of Medical Robotics & Institute of Image Processing and Pattern Recognition
  - Supervisors: Prof. Dr. Yun Gu, Prof. Dr. Jie Yang
- Technical University of Munich (TUM) Munich · Germany Nov. 2024 – Jan. 2026 (expected)
  Academic guest
  - Affiliated with Robotic and Ultrasound Group at the Chair for CAMP & AR, Department of Informatics
  - Host: Prof. Dr. Nassir Navab, Prof. Dr. Zhongliang Jiang (in University of Hong Kong)
- Harbin Institute of Technology Harbin · China Aug. 2016 – Jun. 2020
  BEng in Automation, GPA: 93.88/100
- McGill University Montreal · Canada Jan. 2020 – Mar. 2020
  Visiting undergraduate student in Department of Computer Vision

Internship Experiences

- Shanghai AI Lab Shanghai · China Nov. 2021 – Mar. 2023
  Research Intern @ OpenMMLab
  - Designed a universal foundation model for medical image segmentation
- Medtronic Shanghai · China Mar. 2021 – Oct. 2021
  Research Intern @ Visualization and Robotics, Medtronic Technology Center
  - Designed an automatic framework for vertebrae CT image segmentation

Research Interests

- Universal Medical Image Segmentation
- Temporal Motion Modeling
- Image and Video Synthesis
- Transfer Learning for Foundation Models
- Vertebrae Shape Analysis

Selected Research

- Journals
  - **Xin You**, Junjun He, Jie Yang, Yun Gu. Learning with Explicit Shape Priors for Medical Image Segmentation. IEEE Transactions on Medical Imaging [link]
  - **Xin You**, Yixin, Lou, Minghui Zhang, Jie Yang, Yun Gu. SLoRD: Structural Low-rank Descriptors for Shape Consistency in Vertebrae Segmentation. Journal of Biomedical Health Informatics [link]

- **Xin You**, Ming Ding, Minghui Zhang, Hanxiao Zhang, Junyang Wu, Yi Yu, Jie Yang, Yun Gu. Towards Boundary Confusion for Volumetric Medical Image Segmentation. Medical Image Analysis (Minor revision) [link]
- **Xin You**, Yun Gu, Yingying Liu, Steve Lu, Xin Tang, Jie Yang. VerteFormer: A single‐staged Transformer network for vertebrae segmentation from CT images with arbitrary field of views. Medical Physics [link]
- Chuyan Zhang*, Hao Zheng*, **Xin You**, Yefeng Zheng, Yun Gu. Pass: test-time prompting to adapt styles and semantic shapes in medical image segmentation. IEEE Transactions on Medical Imaging [link]

- Conferences
  - **Xin You**, Runze Yang, Chuyan Zhang, Zhongliang Jiang, Jie Yang, Nassir Navab. FB-Diff: Fourier Basis-guided Diffusion for Temporal Interpolation of 4D Medical Imaging. ICCV 2025 [link]
  - **Xin You**, Minghui Zhang, Hanxiao Zhang, Jie Yang, Nassir Navab. Temporal Differential Fields for 4D Motion Modeling via Image-to-Video Synthesis. MICCAI 2025 [link]
  - Minghui Zhang*, Hanxiao Zhang*, **Xin You**, Yun Gu. Implicit Representation Embraces Challenging Attributes of Pulmonary Airway Tree Structures. MICCAI 2024 [link]
  - **Xin You**, Ming Ding, Minghui Zhang, Yangqian Wu, Yi Yu, Jie Yang, Yun Gu. Semantic Difference Guidance for the Uncertain Boundary Segmentation of CT Left Atrial Appendage. MICCAI 2023 [link]
  - **Xin You**, Yun Gu, Yingying Liu, Steve Lu, Xin Tang, Jie Yang. EG-Trans3DUNet: a single-staged transformer-based model for accurate vertebrae segmentation from spinal CT images. ISBI 2022 [link]
  - **Xin You**, Yun Gu, Junjun He, Hui Sun, Jie Yang. A More Design-Flexible Medical Transformer for Volumetric Image Segmentation. MLMI with MICCAI 2022 [link]

Projects & Research

1. **Universal medical image segmentation based on shape enhancement**

   Challenge: How to effectively design shape guidance to boost segmentation

   - Work 1: A shape prior module is introduced to explicitly interact shape priors with deep features, to boost universal medical image segmentation. **(IEEE TMI, 2024)**
   - Work 2: The dual pushing and pulling branches are introduced to model the interactions between inter-class boundaries and adjacent regions. And the final boundary is dynamically delineated under the interaction of pushing and pulling branches. An equilibrium is achieved to foster a more precise segmentation. **(MICCAI 2023 & MedIA, minor revision)**

2. **Shape prior-based vertebrae segmentation for CT scans with arbitrary field of views**

   Challenge: Intra-vertebrae segmentation inconsistency

   - Work 1: The Edge Detection block is proposed to exert an implicit regularization on the segmentation consistency inside each vertebra. **(Medical Physics, 2023)**
   - Work 2: A instance segmentation framework is introduced to label individual and complete binary masks. Specifically, predefined structural low-rank descriptors are designed for vertebrae shape consistency. **(JBHI, 2025)**

3. **4D temporal video synthesis in medical scenario**

   Challenge: Temporal consistency on breathing-induced motions

   - Work 1: In the preoperative data acquisition stage, the slight movement of patients may result in dynamic backgrounds between the first and last frames in a respiratory period. This additional deviation can hardly be

removed by image registration, thus affecting the temporal motion modeling. To address that limitation, we pioneeringly simulate regular motions via the image-to-video (I2V) synthesis framework, which animates with the first frame to forecast future frames of a given length. **(MICCAI, 2025)**

- Work 2: Following the simplified linear-motion hypothesis, existing approaches adopt optical flow-based models to interpolate intermediate frames. However, realistic respiratory motions should be nonlinear and quasi-periodic with specific frequencies. Intuited by this property, we resolve the temporal interpolation task from the frequency perspective, and propose a Fourier basis-guided Diffusion model, termed FB-Diff. **(ICCV, 2025)**

4. **DINOV3 is a good learner for the super-resolution of volumetric medical data**

Challenge: How to effectively adapt vision foundation models to downstream tasks

- Work 1: The ODE-based interpolator is adopted to model the inter-slice variations of volumetric medical data. Besides, DINOV3 is introduced to extract intra-slice information via semantic similarity maps, to boost the random-scale super-resolution of medical data. (**IEEE TMI, under review**)

Awards & Honors

- Awards

The 1st prize in MICCAI TopCow Challenge	MICCAI	2024
Best Performance Award in MICCAI LIQA challenge	MICCAI	2024
The 2nd prize in MICCAI Lymph Node Quantification Challenge	MICCAI	2023
Silver award for IEEE TMI distinguished reviewers	IEEE TMI	2024
The 1st prize in National Mathematics Competition	Chinese Mathematical Society	2018
Meritorious Winner in American Mathematical Competition in Modeling	COMAP	2019

- Honors

Chinese National Scholarship	Ministry of Education of the P. R. China	2018
– The highest prize for undergraduates in China's Mainland		
Suzhou Industrial Park Scholarship	Suzhou Industrial Park	2019
University-level Merit Student	HIT & SJTU	2019 & 2023

Additional Information

- Teaching services

– C++ programming course	Teaching Assistant	Shanghai Jiao Tong University	2021
– Summer School by Institute of Medical Robotics	Teaching Assistant	Shanghai Jiao Tong University	2023

- Peer review services
  - Conferences: ICLR/ICCV/AAAI/MICCAI
  - Journals: IEEE TMI/MedIA/JBHI/Pattern Recognition
- Language Skills
  - Mandarin native
  - English
- Interest
  - Football, music, and cooking