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Tianzhong Lan

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Research Interest: Computer Vision, Medical Image Analysis, Label-efficient Learning, Domain Adaptation

Education

North China University of Technology	Computer Science	B.Eng.	Sep 2015–Jun 2019
Sichuan University	Software Engineering	M.Eng.	Sep 2019–Jun 2022
Sichuan University	Computer Science	Ph.D.	Sep 2022–Jun 2026
A*STAR (Singapore)	Computer Science	Joint Ph.D.	Jun 2025–Jun 2026

- Ph.D. Advisor: Prof. **Min Zhu** —Director of Graduate School Training Office, Sichuan University.
- Ph.D. Advisor: Prof. **Zhang Yi** —CAS Academician Candidate; **IEEE Fellow**.
- Singapore Advisor: Dr. **Xulei Yang** —Principal Scientist, A*STAR; IEEE Senior Member; Associate Editor for IEEE Transactions on Image Processing, IEEE Transactions on Neural Networks and Learning Systems.
- Singapore Advisor: Dr. **Feng Yang** —Principal Scientist, A*STAR.

Publications

[1] **Tianzhong Lan**, Zhang Yi, Xiuyuan Xu, Min Zhu. "GeoCoBox: Box-supervised 3D Tumor Segmentation via Geometric Co-embedding." AAAI 2026. (oral; **CCF-A**)
- Leverages clear positive/negative samples inside/outside boxes and connected components; contrastive learning integrates spatial position features and pixel-level relations for challenging tumor morphology and fuzzy boundaries.

[2] **Tianzhong Lan**, Zhang Yi, Xiuyuan Xu, Min Zhu. "LooBox: Loose-box-supervised 3D Tumor Segmentation with Self-correcting Bidirectional Learning." ACM MM 2025. (**CCF-A**)
- Cross-domain loose-box supervised tumor segmentation using real clinical region-level labels to achieve pixel-level semantic segmentation.

[3] **Tianzhong Lan**, Nan Chen, Zhang Yi, Xiuyuan Xu, Min Zhu. "Domain Generalization for Pulmonary Nodule Detection via Distributionally-Regularized Mamba." MICCAI 2025. (**CCF-B**)
- A Mamba-based pulmonary nodule detector modeling long-range dependencies to capture domain-invariant differences between nodules and surrounding tissues, yielding strong cross-domain generalization.

[4] **Tianzhong Lan**, Fanxin Zeng, Zhang Yi, Xiuyuan Xu, Min Zhu. "ICNoduleNet: Enhancing Pulmonary Nodule Detection Performance on Sharp Kernel CT Imaging." IEEE Journal of Biomedical and Health Informatics 2024. (JCR Q1)
- Although sharp-kernel CT appears visually clearer, the induced noise can degrade detection. We propose a new detector achieving superior performance to mainstream models under sharp-kernel imaging.

[5] **Tianzhong Lan**, Weili Jiang, Feng Yang, Xulei Yang, Min Zhu. "Wavelet-Driven Cross-Domain Consistency for Mixed-Supervised 3D Tumor Segmentation." to be submitted to CVPR 2026 (**CCF-A**)

- We propose a mixed supervised tumor segmentation method that achieves good segmentation performance by maximizing the utilization of limited data and multi-class labels.

[6] **Tianzhong Lan**, Weili Jiang, Feng Yang, Xulei Yang, Min Zhu. "Less Masks, More Reports: Text-Guided Image-to-Mask Generation for Robust Lung Nodule Segmentation." to be submitted to CVPR 2026 (**CCF-A**)

- A multi-modal approach maximizing the use of pixel masks and radiology reports to generate masks and enable efficient, robust segmentation under domain shifts.

💡 Patents

[1] **CN112669314B** —Lung Cancer Full-cycle Intelligent Management Imaging Data Platform. Lead author. Proposes an AI-driven process management architecture and React-based diagnostic UI design to alleviate response latency and suboptimal UX in traditional CAD systems, providing a platform for cross-domain model deployment and updates.

[2] **CN118212501A** —A Method, System, Device and Medium for Multi-lesion Detection in Lung Cancer. Lead author. Introduces a Transformer-based prior-learning network with self-attention and multi-scale feature fusion to tackle scarce training samples and insufficient multi-lesion collaborative detection.

📄 Projects

[1] **Dec 2019 – Dec 2023** National Key Project "New Generation AI" 2018AAA0100201: New-generation Cognitive Neural Network Models. Responsible for cross-domain robust diagnostic models (R&D and deployment). Deployed a lung-cancer full-cycle imaging management platform in 10+ tier-3 hospitals (e.g., West China Hospital, Dazhou Central Hospital). Model diagnostic accuracy: 96%.

[2] **Jan 2022 – Dec 2024** NSFC Young Scientists Fund 62106163: Intelligent Detection and Characterization of Lung Cancer. Led cross-domain robust lung cancer detection R&D and deployment. The intelligent tele-diagnosis system has been part of routine workflow at Dazhou Central Hospital since Jul 2023; connected to 92 primary hospitals; issued 42,768 reports.

[3] **Oct 2024 – Sep 2026** Tibet S&T Program XZ202402ZY0003: AI Early-warning Model for High-altitude Pulmonary Hypertension via Multi-omics Digitization. Focus on label-efficient pulmonary artery segmentation with state-space modeling to improve early diagnosis and risk assessment.

[4] **Jan 2023 – Dec 2024** Sichuan Key R&D 2023YF0283: Intelligent Diagnosis of Pulmonary Tuberculosis from Clinical Multi-modal Data. Responsible for data curation and multi-modal model training (CT images + clinical text) to boost efficiency and accuracy.

[5] **Jul 2025 – Jul 2026** AI3 HTPO Seed Fund (Singapore; $300k): Label-efficient Meta-learning for Cross-domain Medical Image Segmentation. Lead researcher on an integrated lung-cancer diagnosis system (detection, segmentation, 3D reconstruction, longitudinal follow-up) assisting early-stage diagnosis.

🏆 Competitions

[1] 2021–2022 China "Internet+" Innovation and Entrepreneurship Competition —**National Gold Award**.

🔧 Skills

· Programming: Python, JavaScript, C++.

· Deep Learning: PyTorch (training, evaluation, deployment).

· Systems: Linux command-line; Docker-based deployment.

· Front-end: React, Redux, Qt5.

⭐ Honors & Awards

[1] 2025 China Scholarship Council (CSC) — Awarded for overseas study.

[2] 2022 Outstanding Graduate Student, Sichuan University.

[3] 2020, 2021 Outstanding Graduate Student, Sichuan University.

[4] 2021, 2024 Second-class Scholarship, Sichuan University.