Tianzhong Lan

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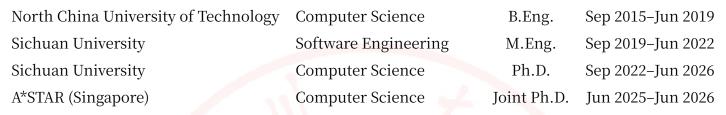**Phone:** +86 188 1156 8798

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

🧪 Publications

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

[2] **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.

[3] **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.

[4] **Tianzhong Lan**, Zhang Yi, Xiuyuan Xu, Min Zhu. "GeoCoBox: Box-supervised 3D Tumor Segmentation via Geometric Co-embedding." AAAI 2025 (under review; **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.

[5] **Tianzhong Lan**, Weili Jiang, Feng Yang, Xulei Yang, Min Zhu. "Wavelet-Driven Cross-Domain Consistency for Mixed-Supervised 3D Tumor Segmentation." AAAI 2025 (under review; **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**; preprint)
- 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.