

Liwen Zou, Ph.D.

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Biography: Liwen Zou is a Ph.D. candidate supervised by **Prof. Xiaoping Yang** at School of Mathematics, Nanjing University. His work focuses on developing AI-based and mathematical model-driven methods for medical image analysis and biomedical engineering. Previously, he has proposed several deep learning models for **medical image segmentation** to support precision diagnosis and treatment of **pancreatic cancer**. He has published over 10 papers in internationally renowned academic journals such as **Medical Image Analysis** and **Artificial Intelligence in Medicine**.

Education

2020-09 – 2025-12

■ **Ph.D. in Applied Mathematics, Nanjing University.**

Supervisor: Prof. Xiaoping Yang

Thesis: *Mechanism Modeling, Clinical Thinking and Deep Learning Fused Medical Image Segmentation Methods for Precision Diagnosis and Treatment of Pancreatic Cancer.*

2016-09 – 2020-06

■ **B.S. in Information and Computing Science, South China University of Technology.**

Supervisor: Prof. Delu Zeng

Thesis: *Measuring the Rogue Wave Pattern Triggered from Gaussian Perturbations by Deep Learning.*

GPA: 3.80/4.00 **Ranking:** 2/35

Research Publications

Journal Articles

- 1 L. Zou, Y. Cao, Z. Nie, L. Mao, Y. Qiu, Z. Wang, Z. Cai, and X. Yang, “Segment like a doctor: Learning reliable clinical thinking and experience for pancreas and pancreatic cancer segmentation,” **Medical Image Analysis**, vol. 102, p. 103 539, 2025, [DOI](#) [GitHub](#).
- 2 L. Zou, Z. Cai, L. Mao, Z. Nie, Y. Qiu, and X. Yang, “Automated peripancreatic vessel segmentation and labeling based on iterative trunk growth and weakly supervised mechanism,” **Artificial Intelligence in Medicine**, vol. 150, p. 102 825, 2024, [DOI](#) [GitHub](#).
- 3 L. Zou, Z. Cai, Y. Qiu, L. Gui, L. Mao, and X. Yang, “Ctg-net: An efficient cascaded framework driven by terminal guidance mechanism for dilated pancreatic duct segmentation,” **Physics in Medicine & Biology**, vol. 68, no. 21, p. 215 006, 2023, [DOI](#) [GitHub](#).
- 4 L. Zou, X. Luo, D. Zeng, L. Ling, and L. C. Zhao, “Measuring the rogue wave pattern triggered from gaussian perturbations by deep learning,” **Physical Review E**, vol. 105, no. 5, p. 054 202, 2022, [DOI](#) [GitHub](#).
- 5 H. Liu, L. Zou, N. Xu, H. Shen, Y. Zhang, P. Wan, B. Wen, X. Zhang, Y. He, L. Gui, et al., “Deep learning radiomics based prediction of axillary lymph node metastasis in breast cancer,” **NPJ Breast Cancer**, vol. 10, no. 1, p. 22, 2024, **(Co-first authors)** [DOI](#) [GitHub](#).
- 6 B. Wang, L. Zou, J. Chen, Y. Cao, Z. Cai, Y. Qiu, L. Mao, Z. Wang, J. Chen, L. Gui, et al., “A weakly supervised segmentation network embedding cross-scale attention guidance and noise-sensitive constraint for detecting tertiary lymphoid structures of pancreatic tumors,” **IEEE Journal of Biomedical and Health Informatics**, vol. 28, no. 2, pp. 988–999, 2023, [DOI](#) [GitHub](#).

- 7 J. Song, **L. Zou**, Y. Li, X. Wang, J. Qiu, and K. Gong, "Combining artificial intelligence assisted image segmentation and ultrasound based radiomics for the prediction of carotid plaque stability," **BMC Medical Imaging**, vol. 25, no. 1, p. 89, 2025, (**Co-first authors**)  DOI.
- 8 L. Tian, **L. Zou**, and X. Yang, "A two-stage data-model driven pancreas segmentation strategy embedding directional information of the boundary intensity gradient and deep adaptive pointwise parameters," **Physics in Medicine & Biology**, vol. 68, no. 14, p. 145 005, 2023,  DOI.
- 9 L. Tian, **L. Zou**, and X. Yang, "Medical image segmentation started from a single point annotation: A novel variational model," **Physica Scripta**, 2025,  DOI.
- 10 C. Ren, **L. Zou**, and L. Gui, "2am: Weakly supervised tumor segmentation in pathology via cam and sam synergy," **Electronics**, vol. 14, no. 15, p. 3109, 2025, (**Co-corresponding authors**)  DOI.

Conference Papers

- 1 Y. Zhu, **L. Zou**, L. Li, and P. Wen, "Selected partially labeled learning for abdominal organ and pan-cancer segmentation," pp. 209–221, **MICCAI Challenge on Fast and Low-Resource Semi-supervised Abdominal Organ Segmentation**, 2023, Springer, 2023.  DOI 
- 2 Y. Zhu, **L. Zou**, P. Wen, Z. Nie, L. Gui, and X. Yang, "A novel pseudo label-based unsupervised multiple target domain adaptation framework for abdominal organ segmentation," pp. 164–177, **MICCAI Challenge on Fast and Low-Resource Semi-supervised Abdominal Organ Segmentation**, 2024, Springer, 2024.  DOI

Research Projects

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|-------------------|---|
| 2020-12 – 2025-12 |  Mathematical Theories and Algorithms for Precision Diagnosis and Treatment of Pancreatobiliary Malignant Tumors. (Role: Subproject Manager ; Funding: Ministry of Science and Technology of the People's Republic of China, No. 2020YFA0713802) |
| 2022-04 – 2023-04 |  Accurate and Efficient AI Models for Pancreatic Cancer and Peripancreatic Vessel Segmentation on CT Images. (Role: Project Leader ; Funding: Postgraduate Research and Practice Innovation Program of Jiangsu Province, China, No. KYCX22_0082) |

Additional Experience

Awards and Achievements

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| 2022 |  Honorable Mention Award, MICCAI PARSE 2022: Pulmonary Artery Segmentation Challenge. |
| 2019 |  Grand Prize, Mathematics Competition of South China University of Technology. |
| 2018 |  Second Prize, National College Student Mathematics Competition of China (Guangdong Division). |
| 2024 |  National Scholarship for Doctoral Students of China. |
| |  Outstanding Graduate Student Model of Nanjing University. |

Patents

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| 2023 |  Yang, X., Zou, L. , Cai, Z., Qiu, Y., Gui, L., Mao, L. "A Dilated Pancreatic Duct Segmentation Method Based on Cascaded Terminal Guidance Mechanism." China Patent, No. 202310639583.1. |
| |  Yang, X., Zou, L. , Cai, Z., Qiu, Y., Nie, Z., Mao, L. A Peripancreatic Vessel Segmentation and Labeling Method Based on Iterative Trunk Growth and Weakly Supervised Learning. China Patent, No. 202310639579.5. |