Liwen Zou

Gender: Male
Date of Birth: 13/01/1999
Add: Nanjing University
School of Mathematics
No. 22, Hankou Road, Gulou District, Nanjing, Jiangsu Province, 210093, P. R. China
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Education

School of Mathematics, Nanjing University **September 2020 - December 2025**

- Ph.D. in Applied Mathematics Nanjing, China
- **Ph.D. Supervisor**: Prof. Xiaoping Yang
- **Research Focus**: Medical Image Analysis; Biomedical Engineering; Deep Learning; Segmentation.
- **Major Courses**: Partial Differential Equations; Numerical Methods for Partial Differential Equations; Variational Theory; Mathematical Optimization; Manifolds and Geometry; Modern Analysis; Abstract Algebra.

School of Mathematics, South China University of Technology **September 2016 - June 2020**

- B.S. in Information and Computing Science Guangzhou, China
- **Major Courses**: Numerical Analysis; Mathematical Statistics; Numerical Solutions of Partial Differential Equations; C++ Programming; Data Structures; Information Theory; Data Mining & Statistical Decision-Making; Mathematical Analysis; Advanced Algebra; Real Analysis; Functional Analysis.
- **GPA**: 3.80/4.00; **Class Ranking**: 2/35

Research Projects

- **Mathematical Theories and Algorithms for Precise Diagnosis and Treatment of Pancreatobiliary Malignancies** **December 2020 – December 2025**
  - **Funding**: Ministry of Science and Technology of the People's Republic of China (No. 2020YFA0713800)
  - **Responsibility**: Develop mathematical models and efficient AI algorithms for improving the accuracy of pancreatic cancer and peripancreatic structure segmentation in medical images.

- **Research on CT Image Segmentation Algorithms for Pancreatic Tumors and Peripancreatic Vessels** **April 2022 – April 2023**
  - **Funding**: Postgraduate Research and Practice Innovation Program of Jiangsu Province, China (No. KYCX22_0082)
  - **Responsibility**: Establish high-precision segmentation frameworks integrating

mathematical modeling and deep learning to achieve automated segmentation of pancreatic tumors and peripancreatic vessels.

Publications

1. **Zou, L**., Cao, Y., Nie, Z., Mao, L., Qiu, Y., Wang, Z., Cai, Z. & Yang, X. (2025). Segment Like A Doctor: Learning Reliable Clinical Thinking and Experience for Pancreas and Pancreatic Cancer Segmentation. *Medical Image Analysis*, 102, 103539.
2. **Zou, L.**, Cai, Z., Mao L., Nie, Z., Qiu, Y., & Yang, X. (2024). Automated Peripancreatic Vessel Segmentation and Labeling Based on Iterative Trunk Growth and Weakly Supervised Mechanism. *Artificial Intelligence in Medicine,* 150, 102825.
3. **Zou, L.**, Cai, Z., Qiu, Y., Gui, L., Mao, L., & Yang, X. (2023). CTG-Net: An Efficient Cascaded Framework Driven by Terminal Guidance Mechanism for Dilated Pancreatic Duct Segmentation. *Physics in Medicine and Biology*, 68, 215006.
4. **Zou, L.**, Luo, X., Zeng, D., Ling, L., & Zhao, L. C. (2022). Measuring the rogue wave pattern triggered from Gaussian perturbations by deep learning. *Physical Review E*, 105(5), 054202.
5. Liu, H, **Zou, L.**, Xu, N., Shen, N., Zhang, Y., Wan, P., Wen, B., Zhang, X., He, Y., Gui, L., & Kong, W. (2024). Deep learning radiomics based prediction of axillary lymph node metastasis in breast cancer. *NPJ Breast Cancer* 10(1): 22.
6. Wang, B., **Zou, L.**, Chen, J., Cao, Y., Cai, Z., Qiu, Y., Mao, L., Wang, Z., Chen, J. Y., Gui, L. & Yang, X. (2023). 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*, 28(2), 988-999.
7. Cai, Z., **Zou, L.,** Li, Q., Chen, J., Qiu, Y., Ji, J., Mao, L. (2025). Deep Learning to Predict Extrapancreatic Perineural Invasion at CT images. *Annals of Medicine*, Accepted.
8. Song, J., **Zou, L.**, Li, Y., Qiu, J. & Gong, K. (2025). Combining Artificial Intelligence Assisted Image Segmentation and Ultrasound Based Radiomics for The Prediction of Carotid Plaque Stability. *BMC Medical Imaging*, 25(1), 89.
9. Li, Y., **Zou, L.**, Song, J. & Gong, K. (2024). Automated Lumen Segmentation in Carotid Artery Ultrasound Images Based on Adaptive Generated Shape Prior. *Bioengineering*, 11(8), 812.
10. Tian, L., **Zou, L.**, & Yang, X. (2023). 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 and Biology*, 68, 145005.
11. Tian, L., **Zou, L.** & Yang, X. (2025). Medical Image Segmentation Started from a Single Point Annotation: A Novel Variational Model. *Physica Scripta*.
12. Ren, C., **Zou, L.**, & Gui, L. (2025). 2AM: Weakly Supervised Tumor Segmentation in Pathology via CAM and SAM Synergy. *Electronics*, 14 (15), 3109.
13. Hou, W., **Zou, L.,** & Wang, D. (2024). Tumor Segmentation in Intraoperative Fluorescence Images Based on Transfer Learning and Convolutional Neural Networks. *Surgical Innovation,* 31(3), 291-306.
14. Zhu, Y., **Zou, L.**, Li, L. & Wen, P. (2024). Selected Partially Labeled Learning for

Abdominal Organ and Pan-cancer Segmentation. In *MICCAI Challenge on Fast and Low-Resource Semi-supervised Abdominal Organ Segmentation. Cham: Springer Nature Switzerland*. 209-221.

15. Zhu, Y., **Zou, L.,** Wen, P., Nie, Z., Gui, L., & Yang, X. (2025). A Novel Pseudo Label-Based Unsupervised Multiple Target Domain Adaptation Framework for Abdominal Organ Segmentation. In *MICCAI Challenge on Fast and Low-Resource Semi-supervised Abdominal Organ Segmentation. Cham: Springer Nature Switzerland*. 164-177.

Patents

1. Yang, X, **Zou, L.**, Cai, Z., Qiu, Y., Gui, L., & Mao, L. (2023). A Dilated Pancreatic Duct Segmentation Method Based on Cascaded Terminal Guidance Mechanism. China Patent, No. 202310639583.1.
2. Yang, X., **Zou, L.**, Cai, Z., Qiu, Y., Nie, Z., & Mao, L. (2023). A Peripancreatic Vessel Segmentation and Labeling Method Based on Iterative Trunk Growth and Weakly Supervised Learning. China Patent, No. 202310639579.5.
3. Yang, X., Tian, L., **Zou, L.**, Nie, Z., Wen, P., & Cao, Y. (2025). A Weakly Supervised Variational Segmentation Algorithm Based on Single-Point Annotation. China Patent, No. 202510010071.8.

Honors

- National Scholarship for Doctoral Students, Nanjing University | 2023-2024
- Outstanding Graduate Student Model, Nanjing University | 2023-2024
- Honorable Mention Award, MICCAI PARSE 2022: Pulmonary Artery Segmentation Challenge | 2022
- Outstanding Graduate Student Model, Nanjing University | 2022-2023
- Huawei Scholarship, Nanjing University | 2022-2023
- First Prize, 2nd College Student Simulation of International Academic Conference English Presentation Competition | 2023
- First-Class Talent Scholarship, Nanjing University | 2021-2022
- Outstanding Graduate Student, Nanjing University | 2021-2022
- Outstanding Volunteer, School of Mathematics, Nanjing University | 2020
- Outstanding Graduation Thesis Award, South China University of Technology | 2020
- Grand Prize, Mathematics Competition, South China University of Technology | 2019
- Second Prize, National College Student Mathematics Competition (Guangdong Division) | 2018
- National Encouragement Scholarship, South China University of Technology | 2018-2019
- National Encouragement Scholarship, South China University of Technology | 2017-2018

English Proficiency

- CET-6 (Score: 543); Fluent in academic writing (published peer-reviewed papers) and oral communication (awarded in English presentation competitions).

Professional Skills

Programming

- Proficient in Python;
- Familiar with C, C++, C#, MATLAB.

AI

- Proficient in mainstream deep learning architectures: CNN, GNN, GAN, Transformer, Diffusion Model, Mamba, etc;
- Proficient in core CV algorithms and foundation CV models (e.g., SAM, MedSAM); Familiar with LLM technologies (e.g., BERT, GPT);
- Proficient in PyTorch; Familiar with TensorFlow.