

ZIQUAN WEI

2nd year PhD student & AI4Science

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EXPERIENCE

Pre-doc Fellow Trainee

University of North Carolina at Chapel Hill

📅 Sept 2022 – Aug 2023 📍 Chapel Hill, US

- Develop a “**GNN-based framework**” that can do 3D nuclei instance segmentation on the whole mouse brain, which contains 30 to 40 million nuclei. Being the first one in the field. Currently running on 40 brains 250GB data of each and analyzing results for publishing.
- Published 3 conference papers on “**MICCAI 2023**”, “**IEEE ISBI 2023**”, and “**NeurIPS 2023**”.

PUBLICATIONS

📄 Preprint

- T. Dan, **Z. Wei**, W. H. Kim, and G. Wu, “Exploring the enigma of neural dynamics through a scattering-transform mixer landscape for riemannian manifold,” accepted by ICML 2024, arXiv preprint arXiv:2405.16357, 2024.
- **Z. Wei**, T. Dan, J. Ding, P. Laurienti, and G. Wu, “Representing functional connectivity with structural detour: A new perspective to decipher structure-function coupling mechanism,” accepted by MICCAI 2024, 2024.
- Y. Wu, Y. Liu, Y. Li, *et al.*, “Symmetry engineering in 2d bioelectronics facilitating augmented biosensing interfaces,” arXiv preprint arXiv:2406.13958; submitted to PNAS with two reviews of minor revision, 2024.
- **Z. Wei**, S. Cheng, J. Cai, S. Zeng, X. Liu, and Z. Wang, “Cervical glandular cell detection from whole slide image with out-of-distribution data,” arXiv preprint arXiv:2205.14625, 2022.
- **Z. Wei**, S. Cheng, J. Hu, L. Chen, S. Zeng, and X. Liu, “An efficient cervical whole slide image analysis framework based on multi-scale semantic and location deep features,” arXiv preprint arXiv:2106.15113, 2021.

📄 Journal Articles

- S. Cheng, S. Liu, J. Yu, *et al.*, “Robust whole slide image analysis for cervical cancer screening using deep learning,” *Nature communications*, vol. 12, no. 1, p. 5639, 2021.
- Z. Yang, Y. Yang, K. Yang, and **Z. Wei**, “Non-rigid image registration with dynamic gaussian component density and space curvature preservation,” *IEEE Transactions on Image Processing*, vol. 28, no. 5, pp. 2584–2598, 2018.
- S. Zhang, K. Yang, Y. Yang, Y. Luo, and **Z. Wei**, “Non-rigid point set registration using dual-feature finite mixture model and global-local structural preservation,” *Pattern Recognition*, vol. 80, pp. 183–195, 2018.
- **Z. Wei**, Y. Han, M. Li, *et al.*, “A small uav based multi-temporal image registration for dynamic agricultural terrace monitoring,” *Remote Sensing*, vol. 9, no. 9, p. 904, 2017.

MOST PROUD OF



Deep Learning for Products

Two projects of “**AI-driven**” medical imaging for object detection and segmentation were researched with “**Python**” and then implemented with “**C++**” for practical products. GitHub repo [URL1](#)¹ and [URL2](#)² with respect to various publications on “**Nature Comm.**” and “**MICCAI**”.



Deep Learning w/Interoperability

Pronounce ideas of “**GNN**” methods with evident analysis by significance “**t-test**” in my current project, papers of which were accepted by “**MICCAI 2024**”, “**ICML 2024**”, and one more submitted to “**NeurIPS 2024**” for prevailing the enigma of human brain connectome.



Citation's Growth

Over 70 new citations per year in the last two years. In total, “**340 citations**” and 6 h-index shown in [Google Scholar](#)

STRENGTHS

AI builder

Linux system admin

Python

C++

Matlab

Latex

LANGUAGES

Mandarin
English



EDUCATION

Ph.D. in Computer Science

University of North Carolina at Chapel Hill

📅 Sept 2023 – on 📍 Chapel Hill, US

M.S. in Biomedical Engineering

Huazhong University of Science and Technology

📅 2019 – 2022 📍 Wuhan, China

¹Chrisa142857/You-Only-Look-Cytopathology-Once

²Chrisa142857/Lightsheet_microscopy_image_3D_nuclei_instance_segmentation

Conference Proceedings

- T. Dan, J. Ding, **Z. Wei**, *et al.*, “Re-think and re-design graph neural networks in spaces of continuous graph diffusion functionals,” in *Advances in Neural Information Processing Systems*, vol. 36, 2023, pp. 59 375–59 387.
- **Z. Wei**, T. Dan, J. Ding, M. Dere, and G. Wu, “A general stitching solution for whole-brain 3d nuclei instance segmentation from microscopy images,” in *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, Springer Nature Switzerland Cham, 2023, pp. 46–55.
- **Z. Wei**, T. Dan, J. Ding, *et al.*, “High throughput deep model of 3d nucleus instance segmentation by stereo stitching contextual gaps,” in *2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI)*, IEEE, 2023, pp. 1–5.
- S. Zhang, Y. Ding, **Z. Wei**, and C. Guan, “Continuous emotion recognition with audio-visual leader-follower attentive fusion,” in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2021, pp. 3567–3574.

Unpublished

- **Z. Wei**, T. Dan, J. Ding, P. Laurienti, and G. Wu, *NeuroPath: A neural pathway transformer for joining the dots of human connectomes*, submitted to NeurIPS 2024 (ratings: 6665), 2024.

B.S. in Computer Science

Yunnan Normal University

📅 2015 – 2019

📍 Kunming, China

REFEREES

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