# 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

### 👥 Top-tier Conference *(* indicates equal contribution)*

- 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 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," in *proceedings of Medical Image Computing and Computer Assisted Intervention – MICCAI 2024*, vol. LNCS 15002, Springer Nature Switzerland, Oct. 2024.
- **Z. Wei**, T. Dan, J. Ding, and G. Wu, "Neuropath: A neural pathway transformer for joining the dots of human connectomes," accepted by NeurIPS 2024, arXiv preprint 2409.17510, 2024.
- 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), co-first author, 2021, pp. 3567–3574

### 📄 Journal

- 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.

## 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 deployed with " **C++** " for practical products. GitHub repo <u>URL1</u>[1] and <u>URL2</u>[2] with respect to various publications on " **Nature Comm.** " and " **MICCAI** ".

💓 **Deep Learning w/Interpretability**
Pronounce ideas of " **Graph Transformer** " methods with evident analysis of significance " $t$-**test** " in my current project, papers of which were accepted by " **MICCAI 2024** ", " **ICML 2024** ", and " **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 <u>Google Scholar</u>

## STRENGTHS

Baseline deploy · CV · Timeseries · Graph

Python · C++ · Linux · Matlab

## LANGUAGES

**Mandarin** ●●●●●
**English** ●●●●○

## EDUCATION

### Ph.D. in Computer Science
**University of North Carolina at Chapel Hill**

📅 Sept 2023 – on          📍 Chapel Hill, US

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- 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.

### 📄 Preprint

- 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.

## M.S. in Biomedical Engineering

**Huazhong University of Science and Technology**

📅 2019 – 2022 📍 Wuhan, China

## B.S. in Computer Science

**Yunnan Normal University**

📅 2015 – 2019 📍 Kunming, China

## REFEREES

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