Zhen Zhou, Ph.D.

Athinoula A. Martinos Center for Biomedical Imaging
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EDUCATION

Zhejiang University — **Hangzhou, China**
Ph.D. in Computer Science and Technology — *Sep 2014 - Dec 2020*

University of North Carolina at Chapel Hill — **Chapel Hill, USA**
Visiting Ph.D. student in Medical Image Analysis — *Nov 2018 - Dec 2020*

Northeastern University — **Shenyang, China**
Bachelor of Engineering in Software Engineering — *Sep 2010 - Jun 2014*

Professional Positions

Massachusetts General Hospital, Harvard Medical School — **Department of Radiology**
Research Fellow — *Aug 2023 - Present*

University of Pennsylvania — **Department of Radiology**
Postdoctoral Researcher — *Jan 2021 - July 2023*

University of North Carolina at Chapel Hill — **Department of Radiology**
Research Assistant — *Nov 2019 - Dec 2020*

Peer-reviewed Full-length Publications

* denotes co-first authors

1. Zhou, Z., B. Fischl, I. Aganj, for the Alzheimer's Disease Neuroimaging Initiative., 2025. Harmonization of Structural Brain Connectivity Through Distribution Matching. *Human Brain Mapping*, 46, no. 9: e70257.
2. Zhou, Z., Li, H., Srinivasan, D., Abdulkadir, A., Nasrallah, I., Wen, J., Doshi, J., Erus, G., Mamourian, E., Bryan, N.R. and Wolk, D.A., 2023. Multiscale functional connectivity patterns of the aging brain learned from harmonized rsfMRI data of the multi-cohort iSTAGING study. *NeuroImage*, p.119911.
3. Zhou, Z., Chen, X., Zhang, Y., Hu, D., Qiao, L., Yu, R., Yap, P.T., Pan, G., Zhang, H. and Shen, D., 2020. A toolbox for brain network construction and classification (BrainNetClass). *Human Brain Mapping*, 41(10), pp.2808-2826.
4. Zhou, Z., Wang, J.B., Zang, Y.F. and Pan, G., 2018. PAIR comparison between two within-group conditions of resting-state fMRI improves classification accuracy. *Frontiers in Neuroscience*, 11, p.740.
5. Zhou, Z., Zhang, H., Hsu, L.M., Lin, W., Pan, G., Shen, D. and UNC/UMN Baby Connectome Project Consortium, 2019. Multi-layer temporal network analysis reveals increasing temporal reachability and spreadability in the first two years of life. In Medical Image Computing and Computer Assisted Intervention–MICCAI 2019: 22nd International Conference, Shenzhen, China, October 13–17, 2019, Proceedings, Part III 22 (pp. 665-672). Springer International Publishing.
6. Zhou, Z., Srinivasan, D., Li, H., Abdulkadir, A., Shou, H., Davatzikos, C. and Fan, Y., 2022, April. Harmonization of multi-site functional connectivity measures in tangent space improves brain age prediction. In Medical Imaging 2022: Biomedical Applications in Molecular, Structural, and Functional Imaging (Vol. 12036, pp. 35-41). *SPIE*.
7. Chen, Y.*, Zhou, Z.*, Liang, Y., Tan, X., Li, Y., Qin, C., Feng, Y., Ma, X., Mo, Z., Xia, J. and Zhang, H., 2021. Classification of type 2 diabetes mellitus with or without cognitive impairment from healthy controls using high-order functional connectivity. *Human Brain Mapping*, 42(14), pp.4671-4684.
8. Zhang, H.*, Zhou, Z.*, Ding, L., Wu, C., Qiu, M., Huang, Y., Jin, F., Shen, T., Yang, Y., Hsu, L.M. and Wang, J., 2022. Divergent and convergent imaging markers between bipolar and unipolar depression based on machine learning. *IEEE Journal of Biomedical and Health Informatics*, 26(8), pp.4100-4110.
9. Jiang, W., Zhou, Z., Li, G., Yin, W., Wu, Z., Wang, L., Ghanbari, M., Li, G., Yap, P.T., Howell, B.R. and

Styner, M.A., 2023. Mapping the evolution of regional brain network efficiency and its association with cognitive abilities during the first twenty-eight months of life. Developmental Cognitive Neuroscience, 63, p.101284.

10. Tan, X., Zhou, Z., Gao, J., Yu, Y., Wei, R., Luo, B. and Zhang, X., 2022. White matter connectometry in patients with disorders of consciousness revealed by 7-Tesla magnetic resonance imaging. *Brain Imaging and Behavior*, 16(5), pp.1983-1991.
11. Wen, J., Nasrallah, I. M., Abdulkadir, A., Satterthwaite, T. D., Yang, Z., Erus, G., ... Zhou, Z., ... & Davatzikos, C., 2023. Genomic loci influence patterns of structural covariance in the human brain. Proceedings of the National Academy of Sciences, 120(52), e2300842120.
12. Antoniades, M., Srinivasan, D., Wen, J., Erus, G., Abdulkadir, A., Mamourian, E., ... Zhou, Z., ... & Davatzikos, C., 2024. Relationship between MRI brain-age heterogeneity, cognition, genetics and Alzheimer's disease neuropathology. EBioMedicine, 109.
13. Wen, J., Yang, Z., Nasrallah, I. M., Cui, Y., Erus, G., Srinivasan, D., ... Zhou, Z., ... & Davatzikos, C., 2024. Genetic and clinical correlates of two neuroanatomical AI dimensions in the Alzheimer's disease continuum. Translational Psychiatry, 14(1), 420.
14. Wen, J., Zhao, B., Yang, Z., Erus, G., Skampardoni, I., Mamourian, E., ... Zhou, Z., ... & Davatzikos, C., 2024. The genetic architecture of multimodal human brain age. Nature communications, 15(1), 2604.
15. Wang, F., Zhang, H., Wu, Z., Hu, D., Zhou, Z., Girault, J.B., Wang, L., Lin, W. and Li, G., 2023. Fine-grained functional parcellation maps of the infant cerebral cortex. eLife, 12, p.e75401.
16. Hou, B., Li, H., Jiao, Z., Zhou, Z., Zheng, H. and Fan, Y., 2023. Deep Clustering Survival Machines with Interpretable Expert Distributions. 2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI).
17. Yu, W., Gu, Q., Wu, D., Zhang, W., Li, G., Lin, L., Lowe, J.M., Hu, S., Li, T.W., Zhou, Z. and Miao, M.Z., 2022. Identification of potentially functional circRNAs and prediction of circRNA-miRNA-mRNA regulatory network in periodontitis: Bridging the gap between bioinformatics and clinical needs. *Journal of Periodontal Research*, 57(3), pp.594-614.
18. Zhang, J., Zhou, Z., Li, L., Ye, J., Shang, D., Zhong, S., Yao, B., Xu, C., Yu, Y., He, F. and Ye, X., 2022. Cerebral perfusion mediated by thalamo-cortical functional connectivity in non-dominant thalamus affects naming ability in aphasia. *Human Brain Mapping*, 43(3), pp.940-954.
19. Hu, D., Wang, F., Zhang, H., Wu, Z., Zhou, Z., Li, G., Wang, L., Lin, W., Li, G. and UNC/UMN Baby Connectome Project Consortium, 2022. Existence of functional connectome fingerprint during infancy and its stability over months. *Journal of Neuroscience*, 42(3), pp.377-389.
20. Jiang, W., Merhar, S.L., Zeng, Z., Zhu, Z., Yin, W., Zhou, Z., Wang, L., He, L., Vannest, J. and Lin, W., 2022. Neural alterations in opioid-exposed infants revealed by edge-centric brain functional networks. *Brain Communications*, 4(3), p.fcac112.
21. Ghanbari, M., Zhou, Z., Hsu, L.M., Han, Y., Sun, Y., Yap, P.T., Zhang, H. and Shen, D., 2021. Altered Connectedness of the Brain Chronnectome During the Progression to Alzheimer's Disease. *Neuroinformatics*, pp.1-13.
22. Merhar, S.L., Jiang, W., Parikh, N.A., Yin, W., Zhou, Z., Tkach, J.A., Wang, L., Kline-Fath, B.M., He, L., Braimah, A. and Vannest, J., 2021. Effects of prenatal opioid exposure on functional networks in infancy. *Developmental Cognitive Neuroscience*, 51, p.100996.
23. Taylor, H.P., Ahmad, S., Wu, Y., Huynh, K.M., Zhou, Z., Wu, Z., Lin, W., Wang, L., Li, G., Zhang, H. and Yap, P.T., 2021. Longitudinal Parcellation of the Infant Cortex Using Multi-modal Connectome Harmonics. In Computational Diffusion MRI: International MICCAI Workshop, Lima, Peru, October 2020 (pp. 251-261). Springer International Publishing.
24. Ghanbari, M., Hsu, L.M., Zhou, Z., Ghanbari, A., Mo, Z., Yap, P.T., Zhang, H. and Shen, D., 2020, September. A new metric for characterizing dynamic redundancy of dense brain chronnectome and its application to early detection of Alzheimer's disease. In Medical Image Computing and Computer Assisted Intervention–MICCAI 2020: 23rd International Conference, Lima, Peru, October 4–8, 2020, Proceedings, Part VII (pp. 3-12). Cham: Springer International Publishing.
25. Soussia, M., Wen, X., Zhou, Z., Jin, B., Kam, T.E., Hsu, L.M., Wu, Z., Li, G., Wang, L., Rekik, I. and Lin, W., 2020. A computational framework for dissociating development-related from individually variable flexibility in regional modularity assignment in early infancy. In Medical Image Computing and Computer Assisted Intervention–MICCAI 2020: 23rd International Conference, Lima, Peru, October 4–8, 2020, Proceedings, Part

VII 23 (pp. 13-21). Springer International Publishing.

26. Kam, T.E., Wen, X., Jin, B., Jiao, Z., Hsu, L.M., Zhou, Z., Liu, Y., Yamashita, K., Hung, S.C., Lin, W. and Zhang, H., 2019. A deep learning framework for noise component detection from resting-state functional MRI. In Medical Image Computing and Computer Assisted Intervention–MICCAI 2019: 22nd International Conference, Shenzhen, China, October 13–17, 2019, Proceedings, Part III 22 (pp. 754-762). Springer International Publishing.
27. Tan, X., Zhou, Z., Gao, J., Meng, F., Yu, Y., Zhang, J., He, F., Wei, R., Wang, J., Peng, G. and Zhang, X., 2019. Structural connectome alterations in patients with disorders of consciousness revealed by 7-tesla magnetic resonance imaging. *NeuroImage: Clinical*, 22, p.101702.
28. Zhang, L., Luo, L., Zhou, Z., Xu, K., Zhang, L., Liu, X., Tan, X., Zhang, J., Ye, X., Gao, J. and Luo, B., 2018. Functional connectivity of anterior insula predicts recovery of patients with disorders of consciousness. *Frontiers in Neurology*, 9, p.1024.
29. Liu, X., Meng, F., Gao, J., Zhang, L., Zhou, Z., Pan, G. and Luo, B., 2018. Behavioral and resting state functional connectivity effects of high frequency rTMS on disorders of consciousness: a sham-controlled study. *Frontiers in Neurology*, 9, p.982.
30. Zhang, J., Wei, X., Xie, S., Zhou, Z., Shang, D., Ji, R., Yu, Y., He, F., Du, Y., Ye, X. and Luo, B., 2018. Multifunctional roles of the ventral stream in language models: advanced segmental quantification in post-stroke aphasic patients. *Frontiers in Neurology*, 9, p.89.
31. Tan, X., Gao, J., Zhou, Z., Wei, R., Gong, T., Wu, Y., Liu, K., He, F., Wang, J., Li, J. and Zhang, X., 2018. Spontaneous recovery from unresponsive wakefulness syndrome to a minimally conscious state: early structural changes revealed by 7-T magnetic resonance imaging. *Frontiers in Neurology*, 8, p.741.
32. Liu, X., Li, J., Gao, J., Zhou, Z., Meng, F., Pan, G. and Luo, B., 2017. Association of medial prefrontal cortex connectivity with consciousness level and its outcome in patients with acquired brain injury. *Journal of Clinical Neuroscience*, 42, pp.160-166.

Abstracts, Preprints, and Others

1. Zhou, Z., Wen, X., Jing, B., Kam, T.-E., Hsu, L.-M., Wu, Z., Soussia, M., Thung, K.-H., Wang, L., Li, G., Yap, P.-T., Zhang, H., Lin, W., Shen, D., for UNC/UMN Baby Connectome Project Consortium, Deep learning-based quality control for infant fMRI based on feature beyond head motion, OHBM, Montreal, Canada, June 26-July 3, 2020.
2. Zhou, Z., Srinivasan D., Li H., Abdulkadir A., Nasrallah I., Wen J., Doshi J., Erus G., Mamourian E., Bryan N., Wolk D., et al. Multiscale functional connectivity patterns of the aging brain learned from rsfMRI data of 4,259 individuals of the multi-cohort iSTAGING study. OHBN, Glasgow, June 19 - June 23, 2022.
3. Taylor, H.P., Ahmad, S., Wu, Y., Huynh, K., Zhou, Z., Wu, Z., Li, G., Lin, W., Wang, L., Shen, D., Zhang, H., Yap, P.-T., Iterative Longitudinal Infant Cortical Parcellation Using Multi-Modal Connectome Harmonics, OHBM, Montreal, Canada, June 26-July 3, 2020.
4. Ghanbari, M., Zhou, Z., Hu, D., Hsu, L.-M., Zhang, H., Shen, D, Dynamic (bi)connectedness unravels differences in brain chronnectome due to Alzheimer's Disease, OHBM, Montreal, Canada, June 26-July 3, 2020.
5. Jiang, W., Zhou, Z., Wen, X., Jing, B., Kam, T.-E., Hsu, L.-M., Wang, L., Wu, Z., Li, G., Thung, K.-H., Yap, P.-T., Lin, W., Zhang, H., Shen, D., for UNC/UMN Baby Connectome Project Consortium, Region-specific Early Developmental Patterns of the Nodal Efficiency in the Infant Brain, OHBM, Montreal, Canada, June 26-July 3, 2020.
6. Zhou, Z., Li, H., Tran, C.B., Ma, Y., Srinivasan, D., Abdulkadir, A., Wen, J., Erus, G., Mamourian, E., Nasrallah, I.M. and Bryan, N., 2023. Cross-scale functional connectivity patterns of the aging brain learned from the multi-cohort iSTAGing study. Alzheimer's & Dementia, 19, p.e077281.
7. Zhou, Z., Fischl, B. and Aganj, I., 2024. Harmonization of Structural Brain Connectivity through Distribution Matching. bioRxiv.
8. Ma, Y., Li, H., Zhou, Z., Chen, X., Ma, L., Guray, E., Balderston, N.L., Oathes, D.J., Shinohara, R.T., Wolf, D.H. and Nasrallah, I.M., 2024. pNet: A toolbox for personalized functional networks modeling. bioRxiv.

Professional services

Service for Organizations
- Guest Editor & Review Editor, Frontiers in Neuroscience 2022-2023

Journal Review
- IEEE Journal of Biomedical and Health Informatics
- IEEE Transactions on Biomedical Engineering
- IEEE Transactions on Medical Imaging
- Communications Biology
- Human Brain Mapping
- Scientific Reports
- Scientific Data
- Medical Physics
- PLoS ONE
- Frontiers in Neuroscience
- Frontiers in Behavioral Neuroscience
- Neural Computing and Applications
- Brain Structure & Function

Conference Review
- Medical Image Computing and Computer Assisted Intervention (MICCAI)
- Organization for Human Brain Mapping (OHBM)

Mentoring

Mentors of colleagues specialized in different domains *Jan 2019 - June 2021*
Department of Radiology, UNC at Chapel Hill
- Dr. Huifeng Zhang from Shanghai Mental Health Center working on identifying the imaging biomarkers of depression
- Dr. Yuna Chen from Guangzhou University of Chinese Medicine on the imaging biomarkers identification on type-2 diabetes mellitus
- Dr. Maryam Ghanbari specialized in Mathematics on brain imaging data analysis

Publicly Available Softwares and Supporting Publications

1. `https://github.com/zzstefan/BrainNetClass`
   Zhou et al., A toolbox for brain network construction and classification (BrainNetClass) 2020
2. `https://github.com/zzstefan/BCP_fMRI_processping_pipeline`
   The first infant/neonate dedicated rs-fMRI data processing pipeline 2021
3. `https://github.com/zzstefan/Mutliscale-brain-aging`
   Zhou et al., Multiscale functional connectivity patterns of the aging brain learned from harmonized rsfMRI data of the multi-cohort iSTAGING study 2023
4. `https://github.com/zzstefan/Distribution_matching`
   Zhou et al., Harmonization of Structural Brain Connectivity Through Distribution Matching 2025