

Yize Zhao

CONTACT INFORMATION Department of Biostatistics
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RESEARCH INTERESTS My methodology research focuses on the development of statistical and machine learning methods to analyze large-scale complex data (neuroimaging, -omics, EHRs), Bayesian methods, feature selection, predictive modeling, data integration, missing data and network analysis. My most recent research agenda includes analytical method development and applications on brain network analyses, multimodal imaging modeling, imaging genetics, and the integration of biomedical data with EHR data.

I have strong interests and expertise in subject matter application fields including psychiatry, aging and mental health.

PROFESSIONAL EXPERIENCE

2024-present	Associate Professor (with tenure), Department of Biostatistics, Yale University
2022-2024	Associate Professor (with term), Department of Biostatistics, Yale University
2019-2022	Assistant Professor, Department of Biostatistics, Yale University
2023-present	Faculty Affiliate, Wu Tsai Institute, Yale University
2023-present	Faculty Affiliate, Center for Brain and Mind Health, Yale University
2023-present	Faculty Affiliate, Biomedical Informatics and Data Science, Yale University
2022-present	Faculty Affiliate, Computational Biology and Bioinformatics, Yale University
2020-present	Faculty Affiliate, Alzheimer's Disease Research Center, Yale University
2019-present	Faculty Affiliate, Yale Center for Analytical Sciences, Yale University
2016-2019	Assistant Professor, Division of Biostatistics and Epidemiology, Weill Cornell Medical College, Cornell University
2014-2016	Postdoctoral Fellow Statistical and Applied Mathematical Sciences Institute (SAMSI), NISS <i>jointly appointed at</i> Department of Biostatistics, University of North Carolina at Chapel Hill

EDUCATION

2010-2014	Ph.D. in Biostatistics Department of Biostatistics and Bioinformatics, Emory University
2006-2010	B.S. in Statistics Department of Mathematics, Zhejiang University, China

AWARDS AND
HONORS

- COPSS Emerging Leader Award, Committee of Presidents of Statistical Societies, 2025
- Thelma and Marvin Zelen Emerging Women Leaders in Data Science Award, Institute of Mathematical Statistics, 2025
- YSPH Investigator Research Award, Yale School of Public Health, 2024
- Elected member, International Statistical Institute, 2021
- ADRC Research Scholar Award, Alzheimer's Disease Research Center, Yale University, 2021
- ADRC Pilot Award, Alzheimer's Disease Research Center, Yale University, 2020
- David P. Byar Travel Award, Biometrics Section, American Statistical Association, 2014
- Student Paper Award, Section on Statistical Learning and Data Mining, American Statistical Association, 2014
- Student Paper Award, Section on Bayesian Statistical Science, American Statistical Association, 2013
- NSF travel award for the 9th Conference on Bayesian Nonparametrics, National Science Foundation, 2013
- The Boyd Harshbarger student travel award, Southern Regional Council on Statistics (SRCOS) Summer Research Conference, 2013
- Award for Best Performance in Ph.D. Qualifying Exams, Department of Biostatistics and Bioinformatics, Emory University, 2012

RESEARCH
GRANTS

Active

- Novel integrative imaging genetics analysis for Alzheimer's disease risk and progression (Zhao)
Role: PI
Funding Agency: NIH/NIA (R01AG068191)
Period: 04/01/2021-03/31/2026
- Integrative analysis for patient-centered outcomes and time-to-event data in Alzheimer's disease (Zhao/Sun)
Role: PI
Funding Agency: NIH/NIA (RF1AG081413)
Period: 05/01/2023-04/30/2028
- An integrative Bayesian approach for linking brain to behavioral phenotype (Constable/Zhao)
Role: mPI
Funding Agency: NIH/NIBIB (R01EB034720)
Period: 08/01/2023-07/31/2027

- IMPACT-MH: Clinical and behavioral fingerprints of psychopathology (Pearlson, Pittenger and Yip)
 - Role: co-I
 - Funding Agency: NIH/NIMH (U01MH136497)
 - Period: 08/12/2024-05/31/2029
- ProCAN: Psychosis Risk Outcomes Compound Assessment Network (Woods, Anticevic, Bearden and Kane)
 - Role: co-I
 - Funding Agency: NIH/NIMH (U01MH137298)
 - Period: 06/14/2024-05/31/2029
- Yale Alzheimer Disease Research Center (Strittmatter)
 - Role: co-I
 - Funding Agency: NIH/NIA (P30AG066508)
 - Period: 06/01/2020-05/31/2025
- A Phase 1b Multiple Ascending Dose Study of the Safety and Tolerability of BMS-984923 in Alzheimer's Disease (Mecca)
 - Role: co-I
 - Funding Agency: NIH/NIA (R01AG73177)
 - Period: 09/30/2021-08/31/2026
- Neural mechanisms of individual differences in early response to medications for opioid-use disorder (Yip)
 - Role: co-I
 - Funding Agency: NIH/NIDA (R01DA060631)
 - Period: 04/01/2024-03/31/2029
- Personalized Recommendations for Acute Kidney Injury (AKI) Care Using a Kidney Action Team: A Randomized Trial (Wilson)
 - Role: co-I
 - Funding Agency: NIH/AHRQ (R01HS027626)
 - Period: 09/30/2021-08/31/2026
- Leveraging Longitudinal Data and Informatics Technology to Understand the Role of Bilingualism in Cognitive Resilience, Aging and Dementia (Zhou/Xu)
 - Role: co-I
 - Funding Agency: NIH/NIA (R01AG080429)
 - Period: 02/15/2023-01/31/2028
- Validation of Imaging Brain Tumor Metabolism Using Deuterated Glucose (Henk De Feyter)
 - Role: co-I
 - Funding Agency: NIH/NIBIB (R01EB033764)
 - Period: 04/01/2023-03/31/2027
- Biomarkers for acute interstitial nephritis in humans (Moledina)
 - Role: co-I
 - Funding Agency: NIH/NIDDKD (R01DK128087)
 - Period: 06/01/2021-05/31/2026

Competed (selected)

- Integrative Clustering and Prediction Analysis for Personalized Cancer Genomics (Zhao)
 - Role: PI
 - Funding Agency: NIH/NCATS (UL1 TR002384-01)
 - Period: 7/1/2017-6/30/2018
- Accelerating Discovery and Validation of Prediction Models of Outcomes in the Psychosis Risk Syndrome (Cannon)
 - Role: co-I
 - Funding Agency: FNIH (AWD0006376)
 - Period: 05/01/2020 – 04/30/2022
- Cornell ME/CFS Collaborative Research Center (Hanson/Grimson/Shungu)
 - Role: co-Director, Integrative Data Analysis Core
 - Funding Agency: NIH/NINDS (U54 NS105541)
 - Period: 9/30/2017-6/30/2019 (relinquished due to institutional move)
- Health and Economic Outcomes of Treatment with Extended-Release Naltrexone Among Pre-Release Prisoners with Opioid Use Disorder (Murphy)
 - Role: co-I
 - Funding Agency: NIH/NIDA (R01DA046721)
 - Period: 9/1/2018-6/30/2019 (relinquished due to institutional move)
- A multiplexed approach to improve tumoral targeting and chemotherapeutic treatment (Law)
 - Role: co-I
 - Funding Agency: NIH/NCI (R01CA222802-01A1)
 - Period: 07/01/2018-06/30/2019 (relinquished due to institutional move)
- No-Gd MRI for Monitoring Disease Status in Multiple Sclerosis (Wang; Gupta; Gauthier)
 - Role: co-I
 - Funding Agency: NIH/NINDS (1R01NS105144-01)
 - Period: 09/30/2018-06/30/2019 (relinquished due to institutional move)

PUBLICATIONS

Peer-reviewed Research Papers Underline indicates lab members and advisees; * indicates senior or corresponding author

1. Yu, T., Zhao, Y., Shen, S. (2013) Assessing association between p-value list. *Statistical Analysis and Data Mining*, 6 (2): 144-155.
2. Wasse, H., Huang, R., Long, Q., Zhao, Y., Singapuri, S., Tangpricha, V. (2014) Very high-dose cholecalciferol and arteriovenous stula maturation in ESRD patients: a randomized, double-blind, placebo-controlled pilot study. *Journal of Vascular Access*, 15 (2): 88-94.
3. Zhao, Y., Kang, J., Yu, T. (2014) A Bayesian nonparametric mixture model for selecting genes and gene sub-networks. *Annals of Applied Statistics*, 8(2): 999-1021.
4. Long, Q., Zhang, X., Zhao, Y., Johnson, B.A., Bostick, R.M. (2016) Modeling clinical outcome using multiple correlated functional biomarkers: a Bayesian approach. *Statistical Methods in Medical Research*, 25(2): 520-537.

5. **Zhao, Y.**, Long, Q. (2016) Multiple imputation in the presence of high-dimensional data. *Statistical Methods in Medical Research*, 25(5): 2021-2035.
6. Lan, Z., **Zhao, Y.**, Kang, J., Yu, T. (2016) Bayesian Network Feature Finder (BANFF): an R package for gene network feature selection. *Bioinformatics*, 32(23): 3685-3687.
7. **Zhao, Y.**, Chung, M., Johnson, B.A., Moreno, C., Long, Q. (2016) Hierarchical feature selection incorporating known and novel biological information: identifying genomic features related to prostate cancer recurrence. *Journal of the American Statistical Association*, 111(516): 1427-1439.
8. **Zhao, Y.**, Zou, F., Lu, Z., Knickmeyer, R., Zhu, H. (2017). "Bayesian feature selection for ultra-high dimensional imaging genetics data". In: *Imaging Genetics*, Ed. by A. Dalca, et al.. Elsevier Science.
9. Gupta, A., Al-Dasuqi, K., Xia, F., Askin, G., **Zhao, Y.**, Delgado, D., Wang, Y. (2017) The use of noncontrast quantitative MRI to detect gadolinium-enhancing multiple sclerosis brain lesions: a systematic review and meta-analysis. *American Journal of Neuroradiology*, 38(7): 1317-1322.
10. **Zhao, Y.**, Long, Q. (2017) Variable selection in the presence of missing data: imputation-based methods. *WIREs Computational Statistics*, 9:e1402.
11. Farooq, Z., Behzadi, A., **Zhao, Y.**, Prince, M. (2017) Complex liver cysts in autosomal dominant polycystic kidney disease. *Clinical Imaging*, 46: 98-101.
12. **Zhao, Y.**, Long, Q. (2017) Imputation with High-dimensional Data. *Wiley StatsRef-Statistics Reference Online*, stat08004.
13. Farooq, Z., Behzadi, A., Blumenfeld, J., **Zhao, Y.**, Prince, M. (2018) Comparison of MRI segmentation techniques for measuring liver cyst volumes in autosomal dominant polycystic kidney disease. *Clinical Imaging*, 47: 41-46.
14. Behzadi, A., Farooq, Z., **Zhao, Y.**, Shih, G., Prince, M. (2018) Dentate nucleus signal intensity decrease on T1-weighted MR images after switching from gadopentetate dimeglumine to gadobutrol. *Radiology*, 287(3): 816-823.
15. Behzadi, A., **Zhao, Y.**, Farooq, Z., Prince, M. (2018) Immediate reactions to gadolinium based contrast agents: a systematic review and meta-Analysis. *Radiology*, 286(2): 471-482.
16. Zhang, S., Nguyen, T., **Zhao, Y.**, Gauthier, S., Wang, Y. (2018) Diagnostic accuracy of semiautomatic lesion detection plus quantitative susceptibility mapping in the identification of new and enhancing multiple sclerosis lesions. *NeuroImage: Clinical*, 28(18): 143-148.
17. Freeze, B., Acosta, D., Pandya, S., **Zhao, Y.**, Raj, A. (2018) Regional expression of genes mediating transsynaptic alpha-synuclein transfer predicts regional atrophy in Parkinson disease. *NeuroImage: Clinical*, 28: 456-466.
18. Nguyen, T.D., Zhang, S., Gupta, A., **Zhao, Y.**, Gauthier, S.A., Wang, Y. (2018) Fast and robust unsupervised identification of MS lesion change using the statistical detection of changes algorithm. *American Journal of Neuroradiology*, 39(5): 830-833.

19. Kelly, J., Amor-Coarasa, A., Ponnala, S., Nikolopoulou, A., Williams, C., Schlyer, D., **Zhao, Y.**, Kim, D., Babich, J. (2018) Trifunctional PSMA-targeting constructs for prostate cancer with unprecedented localization to LNCaP tumors. *European Journal of Nuclear Medicine and Molecular Imaging*, 45(11):1841-1851.
20. Acosta, D., Powell, F., **Zhao, Y.**, Raj, A. (2018) Regional vulnerability in Alzheimer's disease: the role of cell-autonomous and transneuronal processes. *Alzheimer's & Dementia*, 14: 797-810.
21. Lin, E., Scognamiglio, T., **Zhao, Y.**, Schwartz, T.H., Phillips C.D. (2018) Prognostic implications of gadolinium enhancement of skull base chordomas. *American Journal of Neuroradiology*, 39(8):1509-1514.
22. Dyke, J.P., Meyring-Wosten, A., **Zhao, Y.**, Linz, P., Thijssen, S., Kotanko, P. (2018) Reliability and agreement of sodium (^{23}Na) MRI in calf muscle and skin of healthy subjects from the US. *Clinical Imaging*, 52, 100-105.
23. **Zhao, Y.**, Kang, J., Long, Q. (2018) Bayesian spatial variable selection for ultra-high dimensional neuroimaging data: a multiresolution approach. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 15(2):537-550.
24. Chazen, J.L., Cornman-Homono, J., **Zhao, Y.**, Sein, M., Feuer, N. (2018) Magnetic resonance neurography of the lumbosacral plexus for lower extremity radiculopathy: frequency of findings, characteristics of abnormal intraneural signal, and correlation with electromyography. *American Journal of Neuroradiology*, 39 (11): 2154-2160.
25. Zhang, W., Stephens, C., Blumenfeld, J., Behzadi, A., Donohue, S., Bobb, W., Newhouse, J., R ennert, H., **Zhao, Y.**, Prince, M. (2018) Relationship of seminal megavesicles, prostate median cysts, and genotype in autosomal dominant polycystic kidney disease. *Journal of Magnetic Resonance Imaging*, 49 (3): 894-903.
26. Sun, W., Chang, C., **Zhao, Y.**, and Long, Q. (2018) Knowledge-guided Bayesian support vector machine for high-dimensional data with application to genomic Data. *IEEE International Conference on Big Data (IEEE BigData 2018)*, 1484-1493.
27. Zhang X., Chou J., Liang J., Xiao C., **Zhao, Y.**, Sarva H., Henchclife C., Wang F. (2019) Data-driven subtyping of parkinson's disease using longitudinal clinical records: a cohort study. *Scientific Reports* 9:797.
28. **Zhao, Y.**, Chang, C., Long, Q. (2019) Knowledge-guided statistical learning methods for analysis of high-dimensional -omics data in precision oncology. *JCO Precision Oncology*.
29. **Zhao, Y.***, Zhu, H., Lu, Z., Knickmeyer, R., Zou, F. (2019) Structured genome-wide association studies with Bayesian hierarchical variable selection. *Genetics*, 212 (2): 397-415.
30. One, J., Kim, B., **Zhao, Y.**, Christos, P., Tesfaigzi, Y., Worgall, T., Worgall, S. (2020) Decreased sphingolipid synthesis in children with 17q21 asthma-risk genotypes. *The Journal of Clinical Investigation*, 130(2): 921-926.
31. Eng, Y., Yao, X., Liu, K., Risacher, S., Saykin, A., Long, Q., **Zhao, Y.**, Shen, L. (2020) Polygenic mediation analysis of Alzheimer's disease implicated intermediate

- amyloid imaging phenotypes. *AMIA '20: AMIA 2020 Annual Symposium proceedings*, 422-431.
32. Zhang, S., Chiang, G., Knapp J., Zecca, C., He, D., Ramakrishna, R., Magge, R., Posapia D., Fine, H., Tsiouris, A., **Zhao, Y.**, Heier, L., Wang, Y., Kovanlikaya, I. (2020) Grading meningiomas utilizing multiparametric MRI with inclusion of susceptibility weighted imaging and quantitative susceptibility mapping. *Journal of Neuroradiology*, 47:272-277.
 33. **Zhao, Y.***, Li, T., Zhu, H. (2022) Bayesian sparse heritability analysis with high-dimensional neuroimaging phenotypes. *Biostatistics*, 32(2), 467-484.
 34. Li, Y., Yu, C., **Zhao, Y.**, Aseltine, R., Yao, W., Chen, K. (2022) Pursuing sources of heterogeneity in modeling clustered population. *Biometrics*, 78(2), 716-729.
 35. **Zhao, Y.***, Chang, C., Hannum, M., Lee, J., Shen, R. (2021) Bayesian network-driven clustering analysis with feature selection for high-dimensional multi-modal molecular data. *Scientific Reports*, 11(1).
 36. **Zhao, Y.***, Zhao, X., Bao, J., Min, E. and Shen, Li. (2021) A Novel Bayesian Semi-parametric Model for Learning Heritable Imaging Traits. *MICCA '21*, 678-687.
 37. Bao, J., Wen, Z., Kim, M., Zhao, X., Lee, B., Jung, S., Davatzikos, C., Saykin, A., Thompson, P., Kim, D., **Zhao, Y.*** and Shen, L. (2022) Identifying highly heritable brain amyloid phenotypes through mining Alzheimer's imaging and sequencing biobank data. *Pac Symp Biocomput*, 27:109-20.
 38. Bao, J., Wen, Z., Kim, M., Saykin, A., Thompson, P., **Zhao, Y.** and Shen, L. (2022) Identifying imaging genetic associations via regional morphometricity estimation. *Pac Symp Biocomput*, 27:97-108.
 39. **Zhao, Y.***, Sun, Z., Kang, J. (2022) Discussion of "Bayesian Graphical Models for Modern Biological Applications". *Statistical Methods & Applications*, 31(2), 279-286.
 40. Roberts, W., **Zhao, Y.**, Verplaetse, T., Moore, K., Peltier, M., Burke, C., Zakini-aeiz, Y. and McKee, S. (2022) Using machine learning to predict heavy drinking during outpatient alcohol treatment. *Alcoholism: Clinical and Experimental Research*, 46(4), 657-666.
 41. Li, F, Lu, W, Wang, Y., Pan, Z, Greene, E., Meng, G., Meng, C. Blala, O, **Zhao, Y.**, Peduzzi, P. and Esserman, D. (2022) A comparison of analytical strategies for cluster randomized trials with survival outcomes and competing risks. *Statistical Methods in Medical Research*, 31(7), 1224-1241.
 42. Gui Y, Zhou X, Wang Z, Zhang Y, Wang Z, Zhou G, **Zhao, Y.**, Liu M, Lu H, Zhao H. (2022) Sex- specific genetic association between psychiatric disorders and cognition, behavior and brain imaging in children and adults. *Translational Psychiatry*, 12: 347
 43. Xu, F., Garai, S., Duong-Tran, D., Saykin, A.J., **Zhao, Y.** and Shen L, for the ADNI. (2022) Consistency of graph theoretical measurements of Alzheimer's disease fiber density connectomes across multiple parcellation scales. *BIBM22*, 1323-1328.

44. **Zhao, Y.***, Chen, T., Cai, J., Lichenstein, S, Potenza, M. and Yip, S. (2022) Bayesian network mediation analysis with application to brain functional connectome. *Statistics in Medicine*, 41(20), 3991-4005.
45. **Zhao, Y.***, Wu, B., Kang, J. (2023) Bayesian interaction selection model for multi-modal neuroimaging data analysis. *Biometrics*, 79(2), 655-668.
46. **Zhao, Y.***, Change, C., Zhang, J. and Zhang, Z. (2023) Genetic underpinnings of brain structural connectome for young adults. *Journal of the American Statistical Association*, 118 (543), 1473-1487.
47. Worthington, M., Addington, J., Bearden, C, Cadenhead, K., Cornblatt, B., Keshavan, M., Mathalon, D., Perkins, D., Waler, E., Woods, S., **Zhao, Y.** and Cannon T. (2023) Dynamic prediction of outcomes for youth at clinical high-risk for psychosis: A joint modeling approach, *JAMA Psychiatry*, in press.
48. Misra, S., Quinn, T.J., Falcone, G.J., Sharma, V.K., de Havenon, A., **Zhao, Y.**, Eldem, E., French, J.A., Yasuda, C.L., Dawson, J. and Liebeskind, D.S. (2023) Impact of Genetic polymorphisms on the risk of epilepsy amongst patients with acute brain injury: a systematic review. *European Journal of Neurology*, in press.
49. Garai, S., Xu, F., Duong-Tran, D., **Zhao, Y.** and Shen L. (2023) Mining correlation between fluid intelligence and whole-brain large scale structural connectivity. *AMIA Informatics Summit*, 225 233.
50. Wen, Z., Bao, J., Yang, S., Risacher, SL., Saykin, AJ., Thompson, PM., Davatzikos, C., Huang, H., **Zhao, Y.** and Shen L. (2023) Identifying shared neuroanatomic architecture between cognitive traits through multiscale morphometric correlation analysis. *MMMI'23*, in press.
51. Misra, S., Kasner, S., Dawson, J., Tomotaka, T., **Zhao, Y.**, Zaveri, H., Eldem E., Vazquez J. Mohidat S. . . and Mishra, N. (2023) Outcomes in patients with poststroke seizures: a systematic Review and meta-analysis. *JAMA Neurology*, 80(11), 1155-1165.
52. Mishra, N., Kwan, P., Tanaka, T., **Zhao, Y.**, Misra, S. . . ., Kasner, S. (2023) Individual Patient Data Meta-Analysis from International Post-Stroke Epilepsy Research Repository (IPSEER) to characterize post-stroke epilepsy population and their Outcomes: A study protocol. *BMJ Open*, in press.
53. Tian, X., Ciarleglio, M., Cai, J., Greene, E., Esserman, D., Li, F. and **Zhao, Y.*** (2024) Bayesian semi- parametric inference for clustered recurrent events with zero-inflation and a terminal event. *Journal of the Royal Statistical Society: Series C*, 73(3), 598–620. [Earlier version won a student paper from Bayesian Statistical Science Section of the ASA in JSM 2023]
54. Duong-Tran, D., Kaufmann, R., Chen, J., Wang, X., Garai, S., . . . , **Zhao, Y.**, Shen L. (2024) Homological landscape of human brain functional sub-circuits. *Mathematics*, in press.
55. Xu, F., Gao, M., Chen, J., Garai, S., Duong-Tran, D., **Zhao, Y.** and Shen, L. (2024) Topology-based clustering of functional brain networks in an Alzheimer's disease cohort. *AMIA-IS'24*, in press.

56. Li, W., Ballard, J., **Zhao, Y.** and Long, Q. (2024) Knowledge-guided learning methods for integrative analysis of multi-omics data. *Computational and Structural Biotechnology Journal*, 23, 1945-1950.
57. Tian, X., Wang, Y., Wang, S., Zhao, Y., and **Zhao, Y.*** (2024) Bayesian mixed model inference for genetic association under related samples with brain network phenotype. *Biostatistics*, in press.
58. Qiu, W., Chu, H., Wang, S., Zuo, H., Li, X., **Zhao, Y.**, and Ying, R. (2024) Learning High-Order Relationships of Brain Regions. *Proceedings of the International Conference on Machine Learning (ICML)*.
59. Wang, S., Constable, T., Zhang, H. and **Zhao, Y.*** (2024) Heterogeneity analysis on multi-state brain functional connectivity and adolescent neurocognition. *Journal of the American Statistical Association*, 119(546), 851-863.
[Earlier version won the Best Student Paper Award in SMI 2022]
60. Wang, S., Wang, Y., Xu, F., Shen, L. and **Zhao, Y.*** (2024) Establishing group-level brain structural connectivity incorporating anatomical knowledge under latent space modeling. *Medical Imaging Analysis*, 103309.
61. Shen, J., Zhang, Y., Zhu, Z., Cheng, Y., Cai, B., **Zhao, Y.** and Zhao, H. (2024) Joint modeling of human cortical structure: genetic correlation network and composite-trait genetic correlation. *NeuroImage*, 297, 120739.
62. Li, J., Tun, S., Ficek-Tani, B., Xu, W., Wang, S., Horien, C., Toyonaga, T., Nuli, S., Zeiss, S., Powers, A., **Zhao, Y.**, Mormino, E. and Fredericks, C. (2024) Medial amygdalar tau is associated with anxiety symptoms in preclinical Alzheimer's disease. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, in press.
63. Duong-Tran, D., Nguyen, N., Mu S., Chen, J., Bao, J., Frederick, X., Garai, S., . . . , **Zhao, Y.**, Shen L. and Goni., J. (2024) A principled framework to assess information theoretical fitness of brain functional sub-circuits. *Mathematics*, in press.
64. Nguyen, N., Hou, T., Amico, E., Zheng, J., Huang, H., Kaplan, A., Petri, G., Goni, J., Kaufmann, R., **Zhao, Y.**, Shen, L. and Duong-Tran D. (2024) Volume-optimal persistence homological scaffolds of hemodynamic networks covary with MEG theta-alpha aperiodic dynamics. *MICCAI'24*, in press.
65. Wen, Z., Bao, J., Yang, S., Wen, J., Zhan, Q., Cui, Y., Erus, G., Yang, Z., Thompson, P., **Zhao, Y.**, Davatzikos, C. and Shen. L. (2024) Multiscale estimation of morphometricity for revealing neuroratomical basis of cognitive traits. *ISBI'24*, in press.
66. Miller, A., Sharp, E., Wang, S., **Zhao, Y.**, Mecca, A., van Dyck, C. and O'Dell, R. (2024) Self-reported hearing loss is associated with faster cognitive and functional decline but not diagnostic conversion in the ADNI Cohort. *Alzheimer's & Dementia*, in press.
67. Wang, S., Wang, Y., Xu, F., Tian, X., Fredericks, C., Shen, L. and **Zhao, Y.*** (2024) Sex-specific topological structure associated with dementia via latent space estimation. *Alzheimer's & Dementia*, in press.

68. Xu, W., Wang, S., Shen, L. and **Zhao, Y.*** (2024) Collaborative Survival Analysis on Predicting Alzheimer’s Disease Progression. *Statistics in Biosciences*, in press.
69. Dai, W., Zhang, Z., Song, P., Zhang, H. and **Zhao, Y.*** (2024) Heritability and Genetic Contribution Analysis of Structural-Functional Coupling in Human Brain, *Imaging Neuroscience*, in press.
70. Tian, X., Li, F., Shen, L., Esserman, D. and **Zhao, Y.*** (2024) Bayesian pathway analysis over brain network mediators for survival data. *Biometrics*, in press [Earlier version won the John Van Ryzin Award in ENAR 2023]
71. Misra, S., Wang, S., . . . , **Zhao, Y.**, Jette, N., Kasner, S., Kwan, P. and Mishra, N. (2024) Antiseizure medications in post-stroke seizures: A systematic review and network meta-analysis. *Neurology*, in press.
72. Chen, T., Tan, C., Zhao, H., Constable, T., Yip, S. and **Zhao, Y.*** (2024) Bayesian subtyping for multi-state brain functional connectome with application on adolescent brain cognition. *Biostatistics*, in press.
73. Sun, Z., Xu, W., Li, T., Kang, J., Alanis-Lobato G. and **Zhao, Y.*** (2024) Bayesian thresholded modeling for integrating brain node and network predictors. *Biostatistics*, in press.
74. Bao, J., Wen, J., Chang, C., Mu, S., Chen, J., Shivakumar, M., Cui, Y., Erus, G., Yang, Z., Yang, S., Wen, Z., **Zhao, Y.**, Kim, D., Duong-Tran. D., Saykin, AJ., Zhao, B., Davatzikos, C., Long, Q., Shen, L. (2025) A genetically informed brain atlas for enhancing brain imaging genomics. *Nature Communication*, in press.
75. Li, C., Tian, X., Gao, S., Wang, S., Wang, G., Zhao, Y. and **Zhao, Y.*** (2025) Bayesian longitudinal network regression with application to brain connectome genetics. *Statistics in Medicine*, accepted.
76. Zhao, Y. and **Zhao, Y.** (2024+) Covariance-on-Covariance Regression. *Biometrics*, under revision.
77. Xu, W., Wang, S., Tan, C., Shen, X., Luo, W., Constable, T., Li, T. and **Zhao, Y.*** (2024+) Supervised brain node and network construction under voxel-level functional imaging. *Imaging Neuroscience*, under revision.
78. Sun, Y., Zhao, X., Chan, K., Xu, W., Allore, H. and **Zhao, Y.*** (2024+) Semiparametric Joint Modeling for Biomarker Trajectory Before Disease Onset. *Biometrics*, under revision.
79. Wang, S., Zhang, X., Liu, Y., Tian, X. and **Zhao, Y.*** (2024+) Neuroimaging connectivity analysis needs network science for brain-behavior linking. *Nature method*, under revision.
80. Zhang, X., Hulvershorn, L., Constable, T., **Zhao, Y.** and Wang, S. (2024+) Cost efficiency of fMRI studies using resting-state vs task-based functional connectivity. *Human brain mapping*, under revision.

TEACHING *Yale School of Public Health, Yale University*
EXPERIENCE - Advanced Regression Analysis (core course for MS, MPH and PhD in Biostatistics),
Fall 2019, 2020, 2021, 2022, 2023.

Weill Cornell Medicine, Cornell University

- Study Design, Categorical, and Censored Data Analysis (core course for MPH),
Fall 2017, 2018.
- Mater Project II, *Spring 2019.*

Statistical and Applied Mathematical Sciences Institute

- SAMSI Undergraduate Modeling Workshop, *Fall 2015.*

MENTORING **Postdoc Mentoring**

EXPERIENCE Anton Orlichenko Department of Biostatistics, Yale University (2025-present)
Naomi Ding Department of Biostatistics, Yale University (2024-present)
Zhiling Gu Department of Biostatistics, Yale University (2024-present)
Gefei Wang Department of Biostatistics, Yale University (2023-2024)
(Co-supervising with Dr. Hongyu Zhao)
Simiao Gao Department of Biostatistics, Yale University (2023-present)
Zhe Sun Department of Biostatistics, Yale University (2021-2024)
Selena Wang Department of Biostatistics, Yale University (2022-2024).
Current position: Tenure-track Assistant Professor, Indiana University
Wanwan Xu Department of Biostatistics, Yale University (2021-2023).
Current position: Statistical Research Fellow at Unlearn.AI.

PhD Dissertation Advisor

Yixiao Wu PhD in Biostatistics (2024–), Yale University
Xinyuan Tian PhD in Biostatistics (2022–), Yale University
(Co-advising with Dr. Denise Esserman)
Tianqi Chen PhD in Biostatistics (2019–2024), Yale University
(Co-advising with Dr. Hongyu Zhao).
Current position: Data Scientist at Uber.

Dissertation Committee Member

Hamid Abuwarda MD/PhD in Interdepartmental Neuroscience (2020–), Yale University
Shiyang Wang PhD in Biostatistics (2018–), Yale University
Wei Dai PhD in Biostatistics (2018–), Yale University
Wendy Luo PhD in Biomedical Engineering (2018–), Yale University
Hassan Muhammad PhD in Physiology (2017–), WCM/MSKCC
Wenli Sun PhD in Biostatistics (2014-2019), University of Pennsylvania

PhD Qualifying Oral Exam Committee

Jenel Armstrong PhD in Computational Biology and Bioinformatics (2022-)
Spencer Price MD/PhD in Interdepartmental Neuroscience (2022-)
Jiangnan Shen PhD in Biostatistics (2022–), Yale University
Hamid Abuwarda MD/PhD in Interdepartmental Neuroscience (2020–)
Wei Dai PhD in Biostatistics (2018–), Yale University
Zhe Zheng PhD in Epidemiology (2018–), Yale University

PhD Dissertation Reader

Youshu Cheng PhD in Biostatistics, Yale University
Boyang Li PhD in Biostatistics, Yale University
Jinghao Sun PhD in Epidemiology, Yale University

Research Assistants Supervised

Jianing Zhang Biostatistics MS 2024, Yale University
Jinping Liang Biostatistics MS 2024, Yale University
Yuanshuang Guo Biostatistics MS 2023, Yale University
Xinzhi Zhang Biostatistics MS 2023, Yale University
Yunhe Liu Biostatistics MPH 2022, Yale University
(current PhD student in Statistics, Texas A&M University)
Baijia Xu Biostatistics MS 2022, Yale University
(current PhD student in Biostatistics, Emory University)
Chenxi Li Biostatistics MS 2022, Yale University
(current PhD student in Biostatistics, Duke University)
Yiting Wang Biostatistics MPH 2021, Yale University
(current PhD student in Statistics, Virginia University)
Chichun Tan Biostatistics MS 2021, Yale University
(current PhD student in Biostatistics, Brown University)
Xinyuan Tian Biostatistics MS 2021, Yale University
(current PhD student in Biostatistics, Yale University)
Pehan Song Biostatistics MS 2021, Yale University
Jiachen Cai Biostatistics MS 2020, Yale University
(current PhD student in Health Data Science, University of Oxford)
Siqiang Su Biostatistics MS 2020, Yale University
(current PhD student in Statistics, University of Hong Kong)
Jingwen Zhang Statistics MS 2019, Yale University
(current PhD student in Biostatistics, Boston University)

PROFESSIONAL ACTIVITY

Advisory and Leadership

- Council of Sections Representative, Statistics in Imaging Section, American Statistical Association, 2023–present
- Program Associate Chair, 2021 International Biometric Society/Eastern North American Region Spring Meeting, Baltimore, MD, USA
- Member of Regional Advisory Board, International Biometric Society/Eastern North American Region, 2019 – 2022

Editorial Services

- Editorial board:
 - Associate Editor:
Biometrics (2022–), *BMC Medical Research Methodology* (2018–)
 - Guest Editor: *Frontiers in Genetics*
- Journal referee: *Journal of the American Statistical Association*, *Biometrics*, *Annals of Applied Statistics*, *Statistics in Medicine*, *American Journal of Epidemiology*, *NeuroImage*, *Bayesian Analysis*, *Biostatistics*, *Journal of Statistical Computation and Simulation*, *Frontiers in Neuroscience*, *BMC Medical Research Methodol-*

ogy, Neurology, Nature communication, Nature human behaviour, Statistics in Biosciences.

Peer Review Groups/Grant Study Sections

- Standing member, Biodata Management and Analysis (BDMA) study section, NIH, 2022–present
- Panelist, National Science Foundation (NSF), 2023–present.
- Ad hoc Member, Special emphasis panel, NIA, 2022–present
- Reviewer, ASA Statistics in Imaging Section Student Paper Competition, 2018–present
- Reviewer, Statistical Methods in Imaging (SMI) Conference Student Paper Competition, 2022.
- Reviewer, ASA Bayesian Statistical Science Section Student Paper Competition, 2017, 2019.

School Services

- Committee Member: *Faculty search Committee*, Yale School of Public Health, 2024 – present
- Committee Member: *Diversity, Equity and Inclusion (DEI) Committee*, Yale School of Public Health, 2021 – present
- Committee Member: *Faculty Recruitment Committee*, Center for Brain and Mind Health, Yale School of Medicine, 2023.
- Committee Member: *Faculty Recruitment Committee*, Yale Center for Analytical Sciences, Yale School of Public Health, 2022.

Event Organizer

- Invited Session: *New developments for harmonization, processing and modeling for imaging data*. SMI, Indianapolis, IN, 2024.
- Invited Session: *Advancements in Analytical Approaches for Brain Functional and Dynamic Connectivity*. ENAR, Baltimore, MD, 2024.
- Member, Scientific committee, 2024 ICSA Applied Statistics Symposium, Nashville, TN, USA
- Member, Scientific committee, 2023 ICSA Applied Statistics Symposium, Ann Arbor, MI, USA
- Invited Session: *Recent advance in analytical methods for biomedical and clinical data*. CMStatistics, Berlin, Germany, 2023.
- Topic-contribute panel discussion: *Emerging Directions in Statistical and Computational Methodologies in Biomedical Imaging*. JSM, Toronto, Canada, 2023.
- Invited Session: *Statistical Methods for Brain Connectomes*. SMI, Minneapolis, MN, 2023.

- Invited Session: *New Insights on Statistical Modeling for Brain Connectivity and Brain Imaging Genomics*. ENAR, Nashville, TN, 2023.
- Invited Session: *Novel statistical modeling for human brain network*. SMI, Nashville, TN, 2022.
- Invited Session: *Complex response, dimension reduction and data integration with application on neuroimaging*. SMI, virtual conference, 2021.
- Topic contributed session: *Emerging Statistical Methods for Structured and Multi-modal Data Analysis*. JSM, virtual conference, 2020.
- Invited Session: *Recent Advances in Statistical Methods for Imaging Genetics*. ENAR, Atlanta, GA, 2018.
- Invited Session: *Recent Development in Statistical Methods for Analyzing Big and Complex Neuroimaging Data*. JSM, Baltimore, MD, 2017.
- Co-organizer: *SAMSI Undergraduate Modeling Workshop*. SAMSI, Durham, NC, 2015.

INVITED
PRESENTATIONS
& SEMINARS

1. "Coupling of brain structural and functional gradients and their correspondence with cognition and genetics". Whistler Scientific Workshop–Brain Functional Organization, Connectivity, and Behavior, BC, Canada, 2025.
2. "Bayesian Modeling for Brain Connectivity and Its Link to Genetics and Behavior" (plenary talk). Bayes 2024, Rockville, MD, 2024.
3. "Bayesian Imaging genetics modeling for brain structural connectivity" ASA Philadelphia Chapter Webinar, 2024.
4. "Bayesian Inference for Behavior Outcome using Multi-State Dynamic Functional Connectivity". Joint Statistical Meetings, Portland, OR, 2024.
5. "Bayesian mixed model inference for genetic association under related samples with brain network phenotype". The Statistical Methods in Imaging Conference, Indianapolis, IN, 2024.
6. "Bayesian Inference for Behavior Outcome using Dynamic Functional Connectivity during Multi-task Performance". ENAR Spring Meeting, Baltimore, 2024
7. "Bayesian Modeling for Brain Connectivity and Its Link to Behavior". University of Maryland, Department of Epidemiology and Public Health Seminar, 2024
8. "Bayesian Imaging genetics modeling for brain structural connectivity", University of Pennsylvania, Department of Department of Biostatistics, Epidemiology and Informatics Seminar, 2023.
9. "Mapping the Mind: Modeling Brain Connectivity and Its Link to Behavior", Third Penn Conference on Big Data in Biomedical and Population Health Sciences, Philadelphia, PA, 2023
10. "Bayesian Imaging genetics modeling for brain structural connectivity", Rice University, Department of Statistics Seminar, 2023.

11. "Genetic underpinnings of brain structural connectome for young adults", The International Forum on Statistics, Beijing, China, 2023.
12. "Bayesian pathway analysis over brain network mediators for survival data", Joint Conference on Statistics and Data Science, Beijing, China, 2023.
13. "Establishing group-level brain structural connectivity incorporating anatomical knowledge under latent space modeling", ICSA 2023 China conference, Chengdu, China, 2023.
14. "Bayesian pathway analysis over brain network mediators for survival data", ICSA 2023 Applied Statistics Symposium, Ann Arbor, MI, 2023.
15. "Establishing group-level brain structural connectivity incorporating anatomical knowledge under latent space modeling", New England Science Symposium, Boston, MA, 2023.
16. "Bayesian pathway analysis over brain network mediators for survival data", The Statistical Methods in Imaging Conference, Minneapolis, MN, 2023.
17. "Heterogeneity Analysis on Multi-state Brain Functional Connectivity and Adolescent Neurocognition", Vanderbilt University, Department of Biostatistics Seminar, 2023.
18. "Thresholded Prior for Integrating Brain Regional and Network Predictors", ENAR Spring Meeting, Nashville, TN, 2023.
19. "Neurodevelopment subtyping via multidimensional brain functional connectomes", EcoSta Conference 2022, Kyoto, Japan, 2022.
20. "Neurodevelopment subtyping via multidimensional brain functional connectomes", Penn State College of Medicine, Department of Public Health Sciences Seminar, 2022.
21. "Neurodevelopment subtyping via multidimensional brain functional connectomes", Joint Statistical Meetings, Washington, DC, 2022.
22. "Heterogeneity Analysis on Multi-state Brain Functional Connectivity and Adolescent Neurocognition", 35th New England Statistical Symposium, Storrs, CT, 2022.
23. "Mediation analysis with a survival outcome and brain connectivity mediator", the Statistical Methods in Imaging Conference, Nashville, TN, 2022
24. "Genetic underpinnings of brain structural connectome for young adults", Department of Population and Quantitative Health Sciences, Case Western Reserve University School of Medicine, 2022.
25. "Genetic underpinnings of brain structural connectome for young adults", the CM-Statistics 2021, London UK , 2021.
26. "Genetic underpinnings of brain structural connectome for young adults", Department of Statistics, University of Connecticut, 2021.
27. "Construct patient-specific biomarkers trajectory during AD preclinical stage", the National Alzheimer's Disease Research Center Data Cores Webinar, 2021.

28. "Genetic underpinnings of brain structural connectome for young adults", The Statistical Methods in Imaging Conference, Atlanta, GA, 2021.
29. "Genetic underpinnings of brain structural connectome for young adults", Department of Statistics, University of Virginia, 2021.
30. "Genetic underpinnings of brain structural connectome for young adults", Boehringer Ingelheim, 2021.
31. "Imaging Genetics Analysis Under Brain Connectivity with Application on Human Connectome Project", Department of Biostatistics, St. Jude research Hospital, 2020.
32. "Imaging Genetics Analysis Under Brain Connectivity with Application on Human Connectome Project", Joint Statistical Meetings Virtual Conference, 2020.
33. "Bayesian Nonparametric Clustering Analysis with an Incorporation of Biological Network for High-Dimensional Multi-Scale Molecular", The 11th ICSA International Conference, Hangzhou, China, 2019
34. "Bayesian network-driven clustering analysis with feature selection for high-dimensional multi-modal molecular data", The ICSA-Canada Chapter Symposium 2019, Kingston, Ontario, Canada, 2019.
35. "Hierarchical Feature Selection for Complex Biomedical Data", Department of Biostatistics, Yale University, 2018.
36. "Integrative Bayesian Models for Imaging Genetics", Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania, PA, 2018.
37. "Ultra-High-Dimensional Genome-Wide Heritability Analysis with Neuroimaging Phenotypes", Joint Statistical Meetings, Baltimore, MD, 2017.
38. "Hierarchical feature selection incorporating known and novel biological information: identifying genomic features related to prostate cancer recurrence", The 31st New England Statistics Symposium, Storrs, CT, 2017.
39. "Hierarchical feature selection incorporating known and novel biological information: identifying genomic features related to prostate cancer recurrence", 2017 Lifetime Data Science Conference, Storrs, CT, 2017.
40. "Bayesian Feature Selection for Ultra-high Dimensional Imaging Genetics Data", IBM T. J. Watson Research Center, Yorktown Heights, NY, 2017.
41. "Bayesian feature selection for ultra-high dimensional imaging genetics data", Joint Statistical Meetings, Chicago, IL, 2016
42. "Bayesian feature selection for ultra-high dimensional imaging genetics data", Third Taihu International Statistics Forum, Shanghai, 2016.
43. "Bayesian hierarchical variable selection for genome-wide association studies", Joint Statistical Meetings, Seattle, WA, 2015
44. "Bayesian hierarchical variable selection for genome-wide association studies", Bioinformatics Transition Workshop, SAMSI, Durham, NC, 2015.

45. “Bayesian spatial variable selection for ultra-high dimensional neuroimaging data”, Duke University, Durham, NC, 2014.
46. “Hierarchical feature selection incorporating known and novel biological information: identifying genomic features related to prostate cancer recurrence”, Joint Statistical Meetings, Boston, MA, 2014
47. “Bayesian hierarchical feature selection of structured functional predictors measured with error”, Joint Statistical Meetings, Montréal, Canada, 2013
48. “Models beyond Dirichlet process”, Nonparametric Bayesian Interest Group, Emory University, Atlanta, GA. September 2012
49. “A Bayesian mixture model for gene network selection”, Eastern North American Region Spring Meeting, Orlando, FL, 2013
50. “Multiple imputation for high-dimensional Data”, Joint Statistical Meetings, San Diego, CA, 2012

PROFESSIONAL
MEMBERSHIP

- Alzheimer’s Association International Society to Advance Alzheimer’s Research and Treatment (2023 – Present)
- American Statistical Association (2011 – Present)
- Eastern North American Region, International Biometric Society (2012 – Present)
- Institute of Mathematical Statistics (2011 - Present)
- International Society for Bayesian Analysis (2013 - Present)
- International Chinese Statistical Association (2016 – Present)