CURRICULUM VITAE
The Johns Hopkins University School of Medicine

(Signature) _____ _____
(Typed Name) Yuxin (Daisy) Zhu, PhD (Date of this version)

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointments

2021-present Assistant Professor, Johns Hopkins Armstrong Institute for Patient Safety and Quality, Baltimore, MD
2021-present Assistant Professor, Department of Neurology, Johns Hopkins School of Medicine, Baltimore, MD
2022-present Assistant Professor (joint), Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

Personal Data

Johns Hopkins Armstrong Institute for Patient Safety and Quality
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Baltimore, Maryland, 21202

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Education and Training

Undergraduate
2009-2013 B.S., Mathematics, Nanjing University, Nanjing, Jiangsu, China
Doctoral/graduate
2013-2018 Ph.D., Biostatistics, Johns Hopkins University, Baltimore, MD
Postdoctoral
2018-2021 Postdoctoral fellow, Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, and Division of Biostatistics and Bioinformatics, Department of Oncology, Johns Hopkins School of Medicine.

PUBLICATIONS

Original Research [OR]. (* for corresponding and/or senior authorship, underline for mentee, † for co-first authorship.)

Statistical methodology

1. Deng D, Du Y, Ji Z, Rao K, Wu Z, **Zhu Y**, and Coley RY. Predicting survival time for metastatic castration resistant prostate cancer: An iterative imputation approach. F1000Research. 2016; 5; (alphabetically ordered authorship except for the last author.) https://doi.org/10.12688/f1000research.8628.1
2. Wang Z, Tang Z, **Zhu Y**, Pettigrew C, Soldan A, Gross A, and Albert M. AD risk score for the early phases of disease based on unsupervised machine learning. Alzheimer's & Dementia. 2020; 16(11), 1524-1533; contributor in methodology. https://doi.org/10.1002/alz.12140
3. **Zhu Y**, Wang Z, Liberman AL, Chang TP, Newman-Toker D. Statistical insights for crude-rate-based operational measures of misdiagnosis-related harms. Statistics in Medicine. 2021 Sep 10;40(20):4430-41. https://doi.org/10.1002/sim.9039
4. **Zhu Y***, Wang MC. Obtaining optimal cutoff values for tree classifiers using multiple biomarkers. Biometrics. 2022 Mar;78(1):128-40. https://doi.org/10.1111/biom.13409
5. Wang MC, **Zhu Y**. Bias correction via outcome reassignment for cross-sectional data with binary disease outcome. Lifetime Data Analysis. 2022 Jun 24:1-6. https://doi-org.proxy1.library.jhu.edu/10.1007/s10985-022-09559-3

6. **Zhu Y**, Wang Z, Newman-Toker DE. Misdiagnosis-Related Harm Quantification Through Mixture Models and Harm Measures. Biometrics. 2022 Oct 11. https://doi-org.proxy1.library.jhu.edu/10.1111/biom.13759
7. Tang Z, **Zhu Y**, Wang Z. Characterizing Alzheimer's Disease Biomarker Cascade Through Non-linear Mixed Effect Models. arXiv preprint arXiv:2304.09754. 2023 Apr 19.

Collaborative work

8. Pettigrew C, Soldan A, **Zhu Y**, Wang MC, Moghekar A, Brown T, Miller M, Albert M, and BIOCARD Research Team. Cortical thickness in relation to clinical symptom onset in preclinical AD. NeuroImage: Clinical. 2016; 12, 116-122; primary statistician. https://doi.org/10.1016/j.nicl.2016.06.010
9. Guinney, Justin, et al. (Authorship as part of the Prostate Cancer Challenge DREAM Community) "Prediction of overall survival for patients with metastatic castration-resistant prostate cancer: development of a prognostic model through a crowdsourced challenge with open clinical trial data." The Lancet Oncology 18.1 (2017): 132-142. https://doi-org.proxy1.library.jhu.edu/10.1016/S1470-2045(16)30560-5
10. Pettigrew C, Soldan A, **Zhu Y**, Wang MC, Brown T, Miller M, Albert M, and BIOCARD Research Team. Cognitive reserve and cortical thickness in preclinical Alzheimer's disease. Brain imaging and behavior. 2017; 11(2), 357-367; primary statistician. https://doi.org/10.1007/s11682-016-9581-y
11. Albert M, **Zhu Y**, Moghekar A, Mori S, Miller MI, Soldan A, Pettigrew C, Selnes O, Li S, and Wang MC. Predicting progression from normal cognition to mild cognitive impairment for individuals at 5 years. Brain. 2018; 141(3), 877-887; primary statistician. https://doi.org/10.1093/brain/awx365
12. Newman-Toker DE, Schaffer AC, Yu-Moe CW, Nassery N, Tehrani ASS, Clemens GD, Wang Z, **Zhu Y**, Fanai M, and Siegal D. Serious misdiagnosis-related harms in malpractice claims: the "Big Three"–vascular events, infections, and cancers. Diagnosis. 2019; 6(3), 227-240; secondary statistician. https://doi.org/10.1515/dx-2019-0019
13. Pettigrew C, Shao Y, **Zhu Y**, Grega M, Brichko R, Wang MC, Carlson MC, Albert M, and Soldan A. Self-reported lifestyle activities in relation to longitudinal cognitive trajectories. Alzheimer Disease & Associated Disorders. 2019; 33(1), 21-28; primary statistician. https://doi.org/10.1097/WAD.0000000000000281
14. Soldan A, Pettigrew C, **Zhu Y**, Wang MC, Gottesman RF, DeCarli C, Albert M, and BIOCARD Research Team. Cognitive reserve and midlife vascular risk: Cognitive and clinical outcomes. Annals of clinical and translational neurology. 2020; 7(8), 1307-1317; primary statistician. https://doi.org/10.1002/acn3.51120
15. Pettigrew C, Soldan A, **Zhu Y**, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, and DeCarli C. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of aging. 2020; 88, 33-41; primary statistician. https://doi.org/10.1016/j.neurobiolaging.2019.12.003
16. Soldan A, Pettigrew C, **Zhu Y**, Wang MC, Moghekar A, Gottesman RF, Martinez O, Fletcher E, DeCarli C, and Albert M. White matter hyperintensities and CSF Alzheimer disease biomarkers in preclinical Alzheimer disease. Neurology. 2020; 94(9), e950-e960; primary statistician. https://doi.org/10.1212/WNL.0000000000008864
17. Newman-Toker DE, Wang Z, **Zhu Y**, Nassery N, Tehrani ASS., Schaffer AC, Yu-Moe CW, Clemens GD, Fanai M, and Siegal D. Rate of diagnostic errors and serious misdiagnosis-related harms for major vascular events, infections, and cancers: toward a national incidence estimate using the "Big Three". Diagnosis 8.1 (2021): 67-84; secondary statistician. https://doi.org/10.1515/dx-2019-0104
18. Newman-Toker DE, Schaffer AC, Yu-Moe CW, Nassery N, Tehrani ASS, Clemens GD, Wang Z, **Zhu Y**, Fanai M and Siegal D. Corrigendum to: Serious misdiagnosis-related harms in malpractice claims: The "Big Three"–vascular events, infections, and cancers. Diagnosis. 2021; 8(1), pp.127-128; secondary statistician. https://doi.org/10.1515/dx-2020-0034
19. Chen L, Soldan A, Oishi K, Faria A, **Zhu Y**, Albert M, van Zijl PC, and Li X. Quantitative susceptibility mapping of brain iron and β-amyloid in MRI and PET relating to cognitive performance in cognitively normal older adults. Radiology. 2021; 298, no. 2: 353-362; contributing statistician. https://doi.org/10.1148/radiol.2020201603
20. Sharp AL, Baecker A, Nassery N, Park S, Hassoon A, Lee MS, Peterson S, Pitts S, Wang Z, **Zhu Y**, and Newman-Toker DE. Missed acute myocardial infarction in the emergency department–standardizing

measurement of misdiagnosis-related harms using the SPADE method. Diagnosis. 2021; 8(2), pp.177-186; secondary statistician. https://doi.org/10.1515/dx-2020-0049

21. Soldan A, Pettigrew C, **Zhu Y**, Wang MC, Bilgel M, Hou X, Lu H, Miller MI, Albert M and BIOCARD Research Team. Association of Lifestyle Activities with Functional Brain Connectivity and Relationship to Cognitive Decline among Older Adults. Cerebral Cortex. 2021; primary statistician. https://doi.org/10.1093/cercor/bhab187
22. Liberman AL, Hassoon A, Fanai M, Badihian S, Rupani H, Peterson SM, Sebestyen K, Wang Z, **Zhu Y**, Lipton RB, Newman-Toker DE. Cerebrovascular Disease Hospitalizations following Emergency Department Headache Visits: A Nested Case-Control Study. Academic Emergency Medicine. 2021 Jul 26; statistician. https://doi.org/10.1111/acem.14353
23. Pettigrew C, Soldan A, Brichko R, **Zhu Y**, Wang MC, Kutten K, Bilgel M, Mori S, Miller MI, Albert M. Computerized paired associate learning performance and imaging biomarkers in older adults without dementia. Brain imaging and behavior. 2021 Oct 23:1-9. https://doi.org/10.1007/s11682-021-00583-9
24. Pettigrew C, Soldan A, Alm KH, Bakker A, **Zhu Y**, Wang MC, Kutten K, Bilgel M, Miller MI, Faria A, Mori S. White matter tract integrity, but not amyloid burden, is related to cognition in cognitively normal older adults. Alzheimer's & Dementia. 2021 Dec;17:e055675. https://doi.org/10.1002/alz.055675
25. Sharp AL, Pallegadda R, Baecker A, Park S, Nassery N, Hassoon A, Peterson S, Pitts SI, Wang Z, **Zhu Y**, Newman-Toker DE. Are Mental Health and Substance Use Disorders Risk Factors for Missed Acute Myocardial Infarction Diagnoses Among Chest Pain or Dyspnea Encounters in the Emergency Department?. Annals of Emergency Medicine. 2022 Feb 1;79(2):93-101. Statistician. https://doi.org/10.1016/j.annemergmed.2021.08.016
26. Chan CK, Pettigrew C, Soldan A, **Zhu Y**, Wang MC, Albert M, Rosenberg PB, BIOCARD Research Team. Association Between Late-Life Neuropsychiatric Symptoms and Cognitive Decline in Relation to White Matter Hyperintensities and Amyloid Burden. Journal of Alzheimer's Disease. 2022 Feb 21(Preprint):1-2. Primary statistician. https://doi.org/10.3233/JAD-215267
27. Lin Z, Lim C, Jiang D, Soldan A, Pettigrew C, Oishi K, **Zhu Y**, Moghekar A, Liu P, Albert M, Lu H. Longitudinal changes in brain oxygen extraction fraction (OEF) in older adults: Relationship to markers of vascular and Alzheimer's pathology. Alzheimer's & Dementia. 2023 Feb;19(2):569-77.https://doi.org/10.1002/alz.12727
28. Liberman AL, Wang Z, **Zhu Y**, Hassoon A, Choi J, Austin JM, Johansen MC, Newman-Toker DE. Optimizing measurement of misdiagnosis-related harms using symptom-disease pair analysis of diagnostic error (SPADE): comparison groups to maximize SPADE validity. Diagnosis. 2023 Apr 5(0). https://doi.org/10.1515/dx-2022-0130

Book Chapters, Monographs [BC]

1. Scharfstein D, **Zhu Y**, and Tsiatis A. Handbook of Statistical Methods for Randomized Controlled Trials. (1st Edition.) Part II.4. Time to event subject to censoring: logrank test, Kaplan-Meier estimation and Cox proportional hazards regression models. CRC press. 2021.

FUNDING

EXTRAMURAL Funding

Current

07/01/2024-06/30/2026 Time-Dynamic Tree-Based Methods for Personalized Alzheimer's Disease Prediction
R03AG083470
NIH/NIA
$327,5000 (total funding)
PI: Yuxin Zhu
24%

09/01/2019-05/31/2025 Biomarkers of Cognitive Decline Among Normal Individuals: The BIOCARD Cohort
U19 AG033655
NIH/NIA
$21,497,064
PI: Marilyn Albert
35%

Past

09/15/2020 – 05/31/2024 Statistical Models of Alzheimer's Disease Pathological Cascade
5R01AG068002
NIH/NIA
$1,637,500
PI: Zheyu Wang
20%

06/01/2020 – 05/31/2024 Towards a National Diagnostic Excellence Dashboard—Partnering with Stakeholders to Construct Evidence-Based Operational Measures of Misdiagnosis-Related Harms
R01 HS027614
AHRQ
$1,529,695
PI: David Newman-Toker
20%

09/20/2021 – 03/19/2023 Natus Algorithm-Fox Squirrel
N/A
Natus Medical Incorporated
$2,521,365
PI: David Newman-Toker
10%

01/01/2023 – 06/31/2023 Maternal, Infant & Early Childhood Home Visiting Program
23VMZP
State of New Jersey
$522,110
PI: Cynthia Minkovitz
5%

05/15/2018-04/30/2021 National diagnostic performance dashboard to measure and track diagnostic error using big data
#5756
Gordon and Betty Moore Foundation
$2,355,438
PI: David Newman-Toker
Statistician, 50%.

07/01/2009-03/31/2019 Biomarkers of Cognitive Decline among Normal Individuals: the BIOCARD Cohort
U19 AG033655
NIH/NIA
PI: Marilyn Albert

~$3,000,000 yearly
Statistician, 100% from 09/2014 to 06/2018, 50% from 06/2018 to 03/2019.

EDUCATIONAL ACTIVITIES

Educational Focus

I have experience teaching in statistical curriculum courses, special topics, and statistical courses for non-statistics students at undergraduate and graduate levels. I teach to help students succeed and inspire interest in meaningful research and application.

Teaching Role, learner level, course title, venue; any explanatory notes

Classroom instruction

2021, 2023	Guest lecturer, graduate-level, "140.860.01 Current Topics in Biostatistics Research", Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics. Details: (2021) 29 students, "Optimal Rule for Prefixed Tree Classifiers"; (2023) 26 students, "Statistical Methods for Alzheimer's Disease and AD-related biomarkers".
2022, 2023	Primary instructor, graduate-level, "140.607.79 Multilevel Models", Johns Hopkins Bloomberg School of Public Health, Biostatistics and Epidemiology Summer Institute. Class size: 19 (2022), 17 (2023).
2022, 2023	Primary instructor, graduate-level, "140.641.01 Survival Analysis", Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics. Class size: 30 (2022), 24 (2023). Recognized for *Excellence in Teaching (2022, 2023)*.

Mentoring

Pre-doctoral Advisees / Mentees

2022 October – 2024 May	Zhirui Fu, Department of Biostatistics (ScM thesis advisor; thesis work won *JSM 2024 Risk Analysis Student Paper Award*).
2023 July -	Kexin Zhang, Department of Applied Mathematics and Statistics (MS).
2024 June -	Xiyao Zou, Department of Biostatistics (ScM).
2024 June -	Jiyue Zhang, Department of Applied Mathematics and Statistics (MS).

Preliminary Schoolwide Oral Exam Committee (*: alternate member)

2022	*Ruzhang Zhao, Department of Biostatistics (PhD), Johns Hopkins Bloomberg School of Public Health. Advisor: Dr. Hongkai Ji.
2022	*Wei Jin, Department of Applied Mathematics and Statistics (PhD), Johns Hopkins Whiting School of Engineering. Advisor: Dr. Yanxun Xu.
2022	*KunboWang, Department of Applied Mathematics and Statistics (PhD), Johns Hopkins Whiting School of Engineering. Advisor: Dr. Yanxun Xu.
2022	Dongliang Zhang, Department of Biostatistics (PhD), Johns Hopkins Bloomberg School of Public Health. Advisor: Dr. Martin Lindquist.
2024	Zhiyue Zhang, Department of Applied Mathematics and Statistics (PhD), Johns Hopkins Whiting School of Engineering. Advisor: Dr. Yanxun Xu.

Thesis Committees (*: alternate member)

2023	Chunnan Liu, Department of Biostatistics (ScM), Johns Hopkins Bloomberg School of Public Health. Thesis title: "The Association Between Binary Surrogate Endpoints and Time-to-Event Outcomes in Two-Arm Clinical Trials." Role: thesis reader. Advisor: Dr. Chen Hu.
2024	Dongliang Zhang, Department of Biostatistics (PhD), Johns Hopkins Bloomberg School of Public Health. Thesis title: Role: voting member. Advisor: Dr. Martin Lindquist.

2024	*Ruzhang Zhao, Department of Biostatistics (PhD), Johns Hopkins Bloomberg School of Public Health. Thesis title: Role: alternate voting member. Advisor: Dr. Hongkai Ji.
2024	Zhirui Fu, Department of Biostatistics (ScM), Johns Hopkins Bloomberg School of Public Health. Thesis title: "Semiparametric Change Point Model for Survival Outcomes in the Presence of a U-Shaped Risk". Role: advisor.
2024	Weixiao Dai, Department of Biostatistics (PhD), George Washington. Thesis title: "Patient-Centric Pragmatic Subgroup Analyses in Clinical Trials based on the Desirability of Outcome Ranking (DOOR)". Role: voting member. Advisors: Scott R. Evans, and Toshimitsu Hamasaki.

Ad-hoc

2022 June-August	Internship program in collaboration with Eli Lilly; co-advising with Yu Du (Sr. Advisor | Statistics Group). Mentee: Dongliang Zhang.
2024 January -	Jingyi Hao, Department of Applied Mathematics and Statistics (MS).

RESEARCH ACTIVITIES

Research Focus

My research focuses on developing statistical methods for biomarkers and electronic medical records. I work on methods that combine biomarkers to predict cognitive decline related to preclinical Alzheimer's Disease among normal individuals. I also develop methods to evaluate misdiagnosis-related harm at institution or medical system levels using electronic medical records. Methodologically, I work on tree-based models, latent variable models, survival analysis, and recurrent event analysis. My general interest is in interpretable and robust statistical methodology that advances biomedical understanding and informs practices.

ORGANIZATIONAL ACTIVITIES

Journal peer review activities

2019-present	Biostatistics & Epidemiology
2021-present	Journal of the American Statistical Association
2021-present	Alzheimer's & Dementia
2022-present	HealthScienceReport
2022-present	Quality Management in Healthcare
2022-present	JAMA Pediatrics
2022-present	Journal of Alzheimer's Disease
2022-presetn	American Journal of Perinatology
2022-present	Biometrics
2023-present	Scientific Reports
2023-present	Informatics
2023-present	Alzheimer's Research & Therapy

Other peer review activities

2024 February	National Institute of Health, Analytics and Statistics for Population Research Panel B (ASPB).

Conference Organizer

JHMI/Regional

2024 May	8th Annual Diagnostic Excellence Summit. Planning Committee member and moderator.

Professional Societies

2020-present Member, American Statistical Association
2020-present Member, Eastern North American Region of the International Biometric Society

Session Chair

08/12/2021 Joint Statistical Meetings

RECOGNITION

Invited Talks

JHMI/Regional

2024 "SPADE-based Regression Methods and Quality Measures for Quantifying Misdiagnosis-Related Harm", Anesthesiology and Critical Care Medicine Discovery Rounds, Baltimore, MD.
2024 Quality and Safety Research Day. Reaction Panel panelist.

National

2020 "Obtaining Optimal Rule for a Prefixed Tree Classifier", Michigan Statistics for Individualized-healthcare Lab (MiSIL), Department of Biostatistics, University of Michigan. Virtual.
2023 October "The SPADE-Prediction Project", Society to Improve Diagnosis in Medicine Conference, Research and Education Day, Cleveland, OH.
2024 August JSM

OTHER PROFESSIONAL ACCOMPLISHMENTS

Oral/Podium Presentations

2016 "Optimal Decision Rule for Multiple Biomarkers Combined as Tree-based Classifiers", Joint Statistical Meetings, Chicago, IL.
2017 "Adaptive Estimation of High Dimensional Partially Linear Model with Some Provable Gains", Joint Statistical Meetings, Baltimore, MD, and Conference on Frontiers of Big Data Statistical Sciences (organized by ICSA Canada Chapter), Vancouver, BC, Canada.
2020 "Joint Rate Regression Models for Bivariate Recurrent Events with Frailty Processes", Joint Statistical Meetings. Virtual.