Liangliang Zhang

https://case.edu/medicine/pqhs/node/2571

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RESEARCH INTERESTS:
Dr. Zhang focuses on studying the influence of -omics on patient outcomes and disease progression. He develops **bioinformatic tools** and **biostatistical** methods to conduct upstream and downstream analysis of **multiomics** data. Regarding quantitative techniques, his research interests focus on **Bayesian analysis**, **high dimensional models**, and **complex structured data**, such as brain imaging and microbiome data.

WORK

Case Western Reserve University, Cleveland, OH, USA

Assistant Professor in Department of Population and Quantitative Health Sciences   Nov 2021 – present
Chair: Jonathan L. Haines
Roles: Independent research, collaboration, teaching, service.

Member of Case Comprehensive Cancer Center, Immuno-Oncology Program   Jul 2023 – present
Roles: Microbiome, bioinformatics, biostatistics.

University of Texas MD Anderson Cancer Center, Houston, TX, USA

Postdoctoral Scholar in Department of Biostatistics   Nov 2017 – Nov 2021
Advisors: Christine B. Peterson, Kim-Anh Do and Robert R. Jenq.
Research areas: Bayesian methods, variable selection, hypothesis testing, microbiome data analysis.

EDUCATION

Michigan State University, East Lansing, Michigan, USA

Doctor of Philosophy (Ph.D.) in Statistics   Aug 2012 – Aug 2017
Dissertation: High dimensional computational models for biomedical imaging data analysis
Advisor: Tapabrata Maiti; Cumulative GPA: 4.0 / 4.0
Research areas: Bayesian calibration, multi-level model, multi-state model, variable selection, dynamic network.

Michigan State University, East Lansing, Michigan, USA

Master of Science (M.S.) in Statistics   Aug 2012 – Aug 2015
Advisor: Chae Young Lim; Cumulative GPA: 4.0 / 4.0
Research areas: Alzheimer's disease, abdominal aortic aneurysm (AAA), image data analysis.

Soochow University, Suzhou, Jiangsu, China

Master of Science (M.S.) in Financial Mathematics   Sep 2009 – Jun 2012
Thesis: On optimal drift vector and importance sampling for pricing options based on direct simulations
Cumulative GPA: 3.7 / 4.0; Graduation with Honors.
Research areas: Monte Carlo methods, partial differential equations, option pricing, martingale.

Nanjing University of Posts and Telecoms, Nanjing, Jiangsu, China

Bachelor of Science (B.S.) in Statistics   Sep 2005 – Jun 2009
Cumulative GPA: 3.96 / 4.00; Graduation with Honors.

EXPERIENCE

Assistant Professor, Case Western Reserve University   Nov 2021 – present

- Serve as a biostatistician in the funded NIH project 2P30AI036219-26A and collaborate on the Rustbelt Center for AIDS Research (Case/UHC-PItt CFAR).

- Collaborate on the funded NIH research 2R01DE026923-06A1 and study the role of oral fungal dysbiosis in establishing the inflammatory environment and triggering oral immune cells to become dysfunctional

- Serve as a biostatistician in Cleveland Functional Electronic Stimulation (FES) center

- Serve as a biostatistician in Cleveland Alzheimer's Disease Research Center and conduct research on the Gut-Microbiota-Brain axis

- Develop Bayesian variable selection models in generalized linear regression with complex structured predictors

- Collect preliminary data for investigating the associations between tumor microbiome and the metastasis of Pancreatic ductal adenocarcinoma (PDAC)

Postdoctoral Scholar, University of Texas MD Anderson Cancer center   Nov 2017 –Nov 2021

- Performed extensive collaborative research with clinical faculty (e.g. medical oncology, head and neck, infectious diseases) on learning how microbiota in different body sites influence immune responses and the natural history of cancer related diseases.

- Gained experience in statistical genetics and bioinformatics techniques of processing 16S rRNA sequences.

- Released R package and R Shiny App implementing progressive permutation on differential tests.

- Gained technical skills in data science and visualization to describe microbiome data and patient data.

- Developed Bayesian variable selection to identify the microbial biomarkers impacting a continuous outcome.

- Received systematic training in scientific communication and writing that supports research excellence.

Statistical Training and Consulting, Michigan State University   May 2015 – May 2016

- Received professional training in multi-tasking, scheduling meetings and providing services.

- Gained hands-on experiences in communicating with diverse clients from different research areas.

- Gained exposure to the connection between statistical analysis and all kinds of real-world problems.

Graduate Assistant, Michigan State university   Dec 2012 – Aug 2017

- Gained experience and accumulated interests in Alzheimer's disease (AD) research.
- Developed skills in processing Magnetic Resonance Imaging (MRI) and functional MRI (fMRI).
- Performed multi-state model and functional data analysis to model the progression of Alzheimer's disease using structural and functional volumetric variables.
- Developed Bayesian methods for the analysis of high-dimensional image data and completed the project for the prediction of AAA (Abdominal Aortic Aneurysm) enlargement.
- Received solid training in probability and statistics, such as asymptotic theory, decision theory and Bayesian theory.
- Gained hands-on experience in teaching undergraduate and graduate level courses

Master in Financial Mathematics, Soochow University   Sep 2009 – Jun 2012

- Received systematic training in partial differential equations, stochastic analysis and optimization methods.
- Developed Monte Carlo method with importance sampling to solve the stochastic partial differential equations.
- Gained modeling skills for stock and option pricing, such as HJM Model, Heston model and LIBOR model.

PUBLICATIONS   **Peer Reviewed**

28) X. Cao, L. Zhang, and K. Lee.,"Development of network-guided transcriptomic risk score for disease prediction," in *Stat*, Dec 2023.

27) L. Zhang, E. San Valentin, et al. "Influence of oral microbiome on longitudinal patterns of oral mucositis severity in patients with squamous cell carcinoma of the head and neck," in *Cancer*, Sep 2023.

26) C. Yang, …, L. Zhang, "ggpicrust2: an R package for PICRUSt2 predicted functional profile analysis and visualization," in *Bioinformatics*, Aug 2023.

25) F. Yang, L. Zhang, et al. "Consistent group selection using nonlocal priors in regression," in *Statistical Papers*, Mar 2023.

24) D. Francisco, L. Zhang, et al. "Risk Factors Associated with Severe Clostridioides difficile Infection in Patients with Cancer," in *Infectious Diseases and Therapy*, Jan 2023.

23) Y. Shi, L. Zhang, et al. "Sparse tree-based clustering of microbiome data to characterize microbiome heterogeneity in pancreatic cancer," in *Journal of the Royal Statistical Society: Series C*, Jan 2023.

22) Z. Schwabkey, …, L. Zhang, et al. "Diet-derived metabolites and mucus link the gut microbiome to fever after cytotoxic cancer treatment," in *Science Translational Medicine*, Nov 2022.

21) D. Santos, L. Zhang, et al. "Protocolized Training of Advanced Practice Providers for Robotic Surgery Improves the Quality of Intraoperative Assistance," in *Journal of The Society of Laparoscopic & Robotic Surgeons*, Jul 2022.

20) M. Schmiester,…, L. Zhang, et al. ''Flow cytometry can reliably capture gut microbial composition in healthy adults as well as dysbiosis dynamics in patients with aggressive B-cell non-Hodgkin lymphoma," in *Gut Microbes*, May 2022.

19) Y. Shi, L. Zhang, et al. "Performance determinants of unsupervised clustering methods for microbiome data," in *Microbiome*, Jan 2022.

18) M. Schmiester,…, L. Zhang, et al. "Flow Cytometric Analysis of Microbial Diversity in Patients with Aggressive Lymphoma Disease Undergoing Chemoimmunotherapy," in *Blood*, Nov 2021.

17) K. Lee and L. Zhang, "Cumulative Effects of Poverty on Children's Social-Emotional Development: Absolute Poverty and Relative Poverty," in *Community Mental Health Journal*, Nov 2021.

16) D. Santos and L. Zhang, et al. "Chemotherapy and Abdominal Wall Closure Technique Increase the Probability of Postoperative Ventral Incisional Hernia in Patients With Colon Cancer," in *The American Surgeon*, Apr 2021.

15) J. Hajjar, T. Mendoza, L. Zhang, et al. "Associations between the gut microbiome and fatigue in cancer patients, " in *Nature Scientific Reports*, Mar 2021.

14) L. Zhang, Y. Shi, K. Do, R. Jenq, and C. Peterson, "ProgPerm: Progressive permutation for a dynamic representation of the robustness of microbiome discoveries," in *BMC Bioinformatics*, Jan 2021.

13) L. Zhang, B. Zambrano, J. Choi, W. Lee, S. Baek, and C. Lim, "Intraluminal thrombus effect on the progression of abdominal aortic aneurysms by using a multistate continuous-time Markov chain model," in *Journal of International Medical Research*, Nov 2020.

12) Y. Li, L. Zhang, and T. Maiti. "High dimensional linear discriminant analysis for spatially dependent data," in *Electronic Journal of Statistics*, Sep 2020.

11) C. Reyes-Gibby, J. Wang, L. Zhang, et al. "Oral microbiome and onset of oral mucositis in patients with squamous cell carcinoma of the head and neck," in *Cancer*, Sep 2020.

10) L. Zhang, Y. Shi, K. Do, R. Jenq, and C. Peterson, "Bayesian compositional regression with structured priors for microbiome feature selection," in *Biometrics*, Jul 2020.

9) Y. Shi, L. Zhang, K. Do, C. Peterson, and R. Jenq, "aPCoA: Covariate adjusted principal coordinates analysis," in *Bioinformatics*, Apr 2020.

8) Y. Li, <u>L. Zhang</u>, A. Bozoki, D. Zhu, J. Choi, and T. Maiti, "Early prediction of Alzheimer's disease using longitudinal volumetric MRI data from ADNI," in *Health Services and Outcomes Research Methodology*, Dec 2019.

7) M. Shang, <u>L. Zhang</u>, et al. "Identification of hub genes and regulators associated with pancreatic ductal adenocarcinoma based on integrated gene expression profile analysis," in *Discovery Medicine*, Sep 2019.

6) E. Riquelme, Y. Zhang, <u>L. Zhang</u>, et al. "Tumor microbiome diversity and composition influence pancreatic cancer outcomes," in *Cell*, Aug 2019.

5) <u>L. Zhang</u>, Z. Jiang, J. Choi, C. Lim, T. Maiti and S. Baek, "Patient-specific prediction of abdominal aortic aneurysm expansion using Bayesian calibration," in *IEEE J Biomed Health Inform.*, Jan 2019.

4) <u>L. Zhang</u>, Y. Li, C. Lim, T. Maiti, J. Choi, and D. Zhu, "Analysis on conversion of Alzheimer's disease using a multi-state Markov chain model," in *Statistical Methods in Medical Research*, Jul 2018.

3) C.L. Holz, R. K. Nelli, M. E. Wilson, L. Zarski, W. Azab, R. Baumgardner, N. Osterrieder, A. Pease, <u>L. Zhang</u>, et al. "Viral genes and cellular markers associated with neurological complications during herpesvirus infections," in *Journal of General Virology*, Feb 2017.

2) S. Seyedsalehia, <u>L. Zhang</u>, J. Choi, and S. Baek, "Prior distributions of material parameters for Bayesian calibration of growth and remodeling computational model of abdominal aortic wall ," in *Journal of Biomedical Engineering*, Oct 2015.

1) <u>L. Zhang</u>, "Survey to monthly consumption of college students-taking Nanjing University of Posts & Telecommunications as an example," in *Journal of Statistical Thinktank*, Beijing, China, Feb 2009.

Under Review

3) Y. Shi, <u>L. Zhang</u>, KA. Do, RR. Jenq, CB. Peterson, "CAT: a conditional association test for microbiome data using a leave-out approach," in *Bioinformatics*, Nov 2023

2) D. Duan, …, <u>L. Zhang</u>, …, H. Feng, "magpie: a power evaluation method for differential RNA methylation analysis in N6-methyladenosine sequencing," in *PLOS Computational Biology*, Nov 2023

1) M. Wang, …, <u>L. Zhang</u>, "Spatial-Temporal Bayesian Accelerated Failure Time Models for Survival Endpoints with Applications to Prostate Cancer Registry Data," in *BMC Medical Research Methodology*, Aug 2023

GRANT & SUPPORT

Funded support

1) **Rustbelt Center for AIDS Research (Case/UHC-Pitt CFAR)**　　　　May 2022 – Apr 2027
Person Months: 1.2; **Project Number:** 2 P30 AI036219-26A; **Source of Support:** NIH, P30; **PI:** Karn, Jonathan

2) **Amphiregulin-Immunometabolism axis in oral immunity and inflammation during HIV infection**
Jun 2022 – May 2027
Person Months: 0.6; **Project Number:** 2 R01 DE026923-06A1; **Source of Support:** NIH, R01; **PI:** Pandiyan, Pushpa

3) **Data Management and Statistics Core**　　　　　　　　　　Sep 2022 – Aug 2027
Person Months: 1.8; **Source of Support:** Cleveland Alzheimer's Disease Research Center; **PI:** Leverenz, James

4) **Statistical Support Services provided to the Cleveland FES Center**　　　Aug 2022 – Jul 2027
Person Months: 1.8; **Source of Support:** Cleveland VA Medical Center; **PI:** Kirsch, Robert

5) **Associations of Plasma Succinate & Citrate with Neurocognitive Impairment and Other Vascular / Metabolic Outcomes in A5322 (HAILO) Participants**　　　　Feb 2023 – Jan 2024
Effort Months: 1.2; **Source of Support:** MetroHealth, Rammelkamp Research Endowment; **PI:** Kalayjian, Robert

Past support

1) **Sex differences in the gut microbiome of IBD patients and impact of disease pathogenesis** Dec 2022 – Apr 2023
Effort Months: 0.35; **Project Number:** 3 R01 DK042191-30S1; **Source of Support:** NIH, R01; **PI:** Cominelli, Fabio

2) **Development and evaluation of a second-generation fungerp for systematic and cutaneous C. auris infection**　　　　　　　　　　　　　　　Aug 2022 – Aug 2023
Person Months: 1.8; **Project Number:** 1 R01 AI172944-01; **Source of Support:** NIH, R01; **PI:** Ghannoum, Mahmoud

Pending support

1) **Understanding the role of the gut microbiome in BCI performance status**　　Jul 2024 – Jun 2029
Effort Months: 2.4; **Source of Support:** NIH RM1, RFA-NS-23-027; **PI:** Jeffrey Capadona

2) **Mechanisms of Colonic Tumorigenesis in Colitis-associated Cancer**　　　Jul 2024 – Jun 2029
Effort Months: 1.2; **Source of Support:** NIH R01 **PI:** Fabio Caminelli

Not funded

1) **Bayesian network-guided variable selection with applications to microbiome data analysis** Aug 2023 – Jul 2026

Effort Months: 1.2; **Source of Support:** NSF, PD20-8069; **PI:** Cao, Xuan Zhang, Liangliang

2) **Jointly Profiling Microbiome and Transcriptome in Pancreatic Cancer Metastasis**   Jul 2023 – Jun 2025

Effort Months: 1.2; **Source of Support:** NIH, R03, PAR-18-021; **PI:** Feng, Hao Zhang, Liangliang

3) **Cardiac fibrosis proteomics and fatal arrhythmias in chronic kidney disease (CARDIOMIC KIDNEYS)**   Jul 2023 – Jun 2028

Effort Months: 4.8; **Source of Support:** NIH, R01, PA-20-185; **PI:** Dobre, Mirela

TEACHING	**Graduate level teaching Statistical Methods in Medical research (PQHS-431)**, Case Western Reserve University, OH, USA Aug 2022 – Dec 2022

I gave lectures to graduate students from across all kinds of medical related majors. I taught them fundermantal skills including hypothesis testing, linear models and R programming.

Graduate level teaching

Bayesian Statistics (STT874), MSU, MI, USA   Aug 2016 – Dec 2016

I assisted the professor in designing/grading homework problems, collecting topics for class projects, giving lectures when the professor traveled and holding office hours to answer their questions.

Undergraduate level teaching

Statistical Method: Lab session (STT201), MSU, MI, USA   Jan 2014 – May 2014

I gave lectures to teach students how to solve Statistical problems using MINITAB, besides I did grading and help-room.

Probability and Statistics for Engineering (STT351), MSU, MI, USA   Jun 2015 – Aug 2015

Introduction to Probability and Statistics for Business (STT315), MSU, MI, USA Aug 2014 – Dec 2014

Statistical Methods (STT200), MSU, MI, USA   Jan 2013 – May 2013

I did grading, help-room, monitoring exams and recitations of the homework problems.

MENTORING AND ADVISING	**Chenyu Liu**, First year Ph.D. student in Biostatistics Jul 2023 – present present

She is working with me on evaluating and addressing the perfect separation problem in logistic regression.

Second year Master in Statistics, data analyst   Nov 2022 – May 2023 present

She is working with me on identifying plasma proteomics associated with cardiac fibrosis measures in CKD (chronic kidney disease) patients.

Xi Qiao, Research Associate in my Lab, Ph.D. in Statistics   Aug 2023 – present

Her research interests include causal mediation analysis, high-dimensional genome-wide analysis, Bayesian inference, and causal inference.

Sarah Grabinski, Biostatistician in my Lab   Oct 2023 – present

She is studying the potential link between gut bacteria and neuro-inflammation, revealing that certain gut bacterial constituents enter the brain following microelectrode implantation.

Summer Intern in my Lab, M.S. in Biostatistics   Jun 2023 – Jul 2023

The intern project investigated the varied influences of Transcranial Magnetic Stimulation (TMS) measures on clinical outcomes in the context of both involved and uninvolved limbs.

Ruitao Liu, Data Analyst in my lab, M.S. in Computer Science   Feb 2023 – present

He is facilitating the bioinformatic pipelines to analyze the sequencing data, involving both 16S and whole-genome shotgun (WGS) sequencing, and the reconstruction of phylogenetic trees.

Dinh Duy An Nguygen, Second year PhD in System Biology, dissertation committee with Thomas LaFramboise   Jun 2023 – present

He is investigating the tumor microbial RNA contents in patients with Acute Myeloid Leukemia, exploring its potential as both prognostic and diagnostic biomarkers.

Daoyu Duan, Second year PhD in Biostatistics, dissertation committee with Hao Feng   Feb 2023 – present

He is exploring statistical methods in Epitranscriptome studies, with a special emphasis on N6-methyladenosine (m6A) data analysis.

Remote students Chen Liu, Ph.D. student at the University of Pittsburgh

Yiqian Zhang, Undergraduate at the University of Illinois Champaign

Zixiang Yin, Ph.D. student at the University of Tulane

Xiangning Xue, Ph.D. student at the University of Pittsburgh   Feb 2023 – present

I knew the first three students because they sent me emails and expressed strong interest in engaging in interdisciplinary research in the fields of biostatistics and microbiome. I knew Xiangning through her advisor George Tseng, as I could help with the Bayesian modeling.

Jiasen Zhang, Third year PhD in Statistics, co-advisor with Weihong Guo   Dec 2022 – present

He is performing deconvolution of cell types for spatial transcriptomics by using total variation spatial regularization for sparse hyperspectral unmixing

George Hoeferlin, Fourth year PhD in Biomedical Engineering, Project Mentor   Feb 2023 – Dec 2023

He characterized the relationship between gut microbiome composition and electrode recording performance in rodents, which will facilitate clinical translation of brain-machine interfaces.

Danying Cao, First year Master in Statistics, data analyst   Nov 2022 – Aug 2023 present
She worked with me on studying associations of Plasma Succinate & Citrate with Neurocognitive Impairment and Other Vascular / Metabolic Outcomes in A5322 (HAILO) Participants

Chen Yang, Third year undergraduate in Biostatistics, remote supervising   May 2022 – May 2023
He developed inference tools to test the differences of pathway abundances between comparison groups by taking the functional prediction results of 16S rRNA profiling.

Xinxu Sun, First year PhD in Biomedical and Health Informatics, doing rotations   Dec 2022 – Feb 2023
He worked with me on studying the treatment effect of Trikafta on Cystic Fibrosis and comparing the microbiome differences between treatment and control group.

Hossam Sarhan, First year PhD in Biomedical and Health Informatics, doing rotations   Sep 2022 – Nov 2022
He worked with me on analyzing the association between BMI, plasma ceramide levels and TREM2 in normal cognition subjects at risk for AD and among T2DM subjects.

CONFERENCE & WORKSHOP	Invited talk on "Bayesian strategies in modeling microbiome data with complex structures", 2023 ICSA Applied Statistics Symposium Jun 2023

Invited talk on "Bayesian strategies in modeling microbiome data with complex structures", 2023 ICSA Applied Statistics Symposium   Jun 2023

2023 MPS Workshop for Young Investigators at Washington D.C. (6/4-/6), Supported by NSF   Jun 2023

Invited talk on "Bayesian Shrinkage Kernel Regression for joint selection of microbiome data", 2023 IISA Conference   Jun 2023

Invited talk on "Bayesian strategies in modeling high-dimensionality and compositionality of microbiome data with complex structures", Cleveland Clinic - Case Western Reserve University - Ohio State University 2023 Annual Joint Biostatistics Symposium   Apr 2023

Invited talk on "New statistical approaches for linking entire and individual microbiome to patient outcomes", CMStatistics 2022 hybrid conference   Dec 2022

Invited talk on "Volcano and valley prior with adhesive shrinkage for high dimensional data", ICSA Applied Statistics Symposium   Jun 2022

Invited talk on "New statistical approaches for microbiome selection and cancer research", BERD seminar at McGovern Medical School, UTHealth   Apr 2022

Invited talk on "Bayesian Zero-Constrained Regression Modeling with Structured Prior for Microbiome Feature Selection", ENAR Spring Meeting   Mar 2022

Invited talk on "Bayesian compositional regression for microbiome feature selection and cancer research", UC Statistics Seminar at University of Cincinnati   Mar 2022

Invited talk on "Bayesian Zero-Constrained Regression Modeling with Structured Prior for Microbiome Feature Selection", Joint Statistical Meetings (JSM), Virtual Meeting   Aug 2021

Invited talk on "Bayesian compositional regression with structured priors for microbiome feature selection", ICSA Applied Statistics Symposium, Virtual Meeting   Dec 2020

Attending "Cold Spring Harbor Laboratory Meeting on Microbiome", Virtual Meeting   Oct 2020

Presentation of "Bayesian logistic regression and survival models with structured priors for microbiome feature selection", Joint Statistical Meetings (JSM), Virtual Meeting   Aug 2020

Presentation of "Progressive permutation for a dynamic representation of the robustness of microbiome discoveries", iBright Conference, Houston, TX   Nov 2019

Presentation of "A new flexible prior being local and nonlocal for Bayesian variable selection", Joint Statistical Meetings (JSM), Denver, CL   Jul 2019

Presentation of "Bayesian variable selection in regression with compositional covariates", Eastern North American Region (ENAR), Philadelphia, PA   Mar 2019

Attending talks on "Gut health, microbiota & probiotics throughout the lifespan", Harvard Probiotics Symposium, Boston, MA   Oct 2018

Poster presentation of "Supervised learning on the progression of Alzheimer's disease using a multi-state Markov model", Eastern North American Region (ENAR), IBM T. J. Watson Research Center, NY Jun 2017

Presentation of "Patient-specific prediction of abdominal aortic aneurysm expansion using Bayesian calibration", Joint Statistical Meetings (JSM), Chicago, IL   Aug 2016

Presentation of "Bayesian calibration methods and its application in biomedical science", Eastern North American Region (ENAR), Austin, TX   Mar 2016

Attending CCNS: Computational neuroscience summer school, SAMSI (Statistical and Applied Mathematical Sciences Institute), Durham, NC   Jul 2015

ACADEMIC HONORS & AWARDS	Winner in student poster competition, ISBIS, IBM T. J. Watson Research Center, NY, USA Jun 2017

Winner in student poster competition, ISBIS, IBM T. J. Watson Research Center, NY, USA   Jun 2017

Dissertation Completion Fellowship, Michigan State University, USA   Dec 2016

Paid Workshop on Challenges in Computational Neuroscience, SAMSI, USA   Jul 2015

Dissertation Continuation Fellowship, Michigan State University, USA   May 2015

Admitted by MSU with a TA scholarship, USA   Mar 2012

Honorary Title of outstanding post-graduate student, Soochow University, China   Jun 2011

The Third Prize in National Post-Graduate Mathematical Contest in Modeling.   Dec 2009

The Tri-Excellent Student, Nanjing University of Posts & Telecoms, China.   Nov 2008

	The National Inspirational Scholarship.	Nov 2008
	The First Prize in National College Mathematical Modeling Contest of Jiangsu, China.	Dec 2007
	The First-class Scholarship of NUPT & of Jiangsu Province.	Nov 2006

SOFTWARE

R Shiny App for visualizing the results from progressive permutation analysis of microbiome data (https://biostatistics.mdanderson.org/shinyapps/ProgPerm/)

R package "ProgPerm" for preforming progressive permutation analysis on microbiome data (https://github.com/LyonsZhang/ProgPerm)

MATLAB package "BAZE" for Bayesian zero-constrained regression with compositional covariates (https://github.com/LyonsZhang/BAZE)

SKILLS

Programming: MATLAB, R, SAS, SQL, Python, MINITAB, SPSS, C++, Mathematica, HPCC, LaTeX.

Computing: Monte Carlo simulation, MCMC, Gibbs sampling, EM-algorithm, variance reduction, importance sampling, Metropolis-Hastings, simulated annealing, search and optimization methods, finite-element, clustering, permutation, PCoA, dimension reduction, Laplace approximation, graphical models, image processing, gene sequencing, etc.

PROFESSIONAL MEMBERSHIP & SERVICE

Paper Reviewer
Biometrics (1)
Statistics in Medicine (5)
Genome Biology (1)
Gut Microbes (1)
BMC Bioinformatics (1)
BMC Medical Research Methodology (1)
BMC Medical Informatics and Decision Making (1)
Journal of Applied Statistics (1)

Jan 2023–Dec 2023

Biometrics
Computational Statistics and Data Analysis
Statistics in Medicine
Computational Statistics
Journal of Applied Statistics
Statistics in Biosciences
Sankhya B The Indian Journal of Statistics
Bioinformatics
BMC Bioinformatics
PLOS Computational Biology
Gut Microbes
mSystems Journal
Health Services & Outcomes Research Methodology (HSOR)
Journal of Dynamic Systems, Measurement and Control
Frontiers in Endocrinology
Frontiers in Pharmacology
Frontiers in Education
Journal of Immunotherapy and Precision Oncology
IEEE Access

Dissertation Committee

Daoyu Duan, Ph.D. student of EPBI program at CWRU, Chair: Hao Feng
The objective of the proposal is to empower researchers with robust tools for the analysis of complex epitranscriptome data, addressing challenges in DMR detection, power analysis, and specialized methods for single-base N6-methyladenosine and pseudouridinedata.

Feb 2023–present

Dinh Duy An Nguyen, Ph.D. student of SYBB program at CWRU, Chair: Thomas LaFramboise
The objective of the proposal is to investigate the tumor microbial RNA contents in patients with Acute Myeloid Leukemia, exploring its potential as both prognostic and diagnostic biomarkers.

Jun 2023–present

Xiangning Xue, Ph.D. student of Biostatistics program at University of Pittsburg, Chair: George Tseng
The research focuses on investigating the circadian pattern of gene expression in neurodegenerative diseases through a Bayesian model called CircaBayes, designed for multi-group circadian analysis.

May 2023–present

Other Committee

Protocol Review & Monitoring Committee   MetroHealth Medical Center
I assess the suitability of statistical methods, conduct evaluations of sample size calculations, review randomization procedures, and examine data analysis plans.

Aug 2023–present

EPIBIO Qualify Exam Committee   Department of Population and Quantitative Health Sciences
I am responsible for designing, reviewing, and administering a comprehensive exam, evaluating candidates' understanding of epidemiology and biostatistics, providing feedback, and ensuring adherence to policies and continuous improvement of the exam process.

Aug 2023–present

Grant Training and Service

2023 MPS Workshop for Young Investigators at Washington D.C., Supported by NSF

Jun 2023–Jun 2023

NSF Reviewer,   2024

Session Chair

Session title: Bayesian variable selection: when horseshoe meets nonlocal; JSM 2020 topic-contributed program; Session Sponsor: Section on Bayesian Statistical Science   Aug 2020
Session title: Bayesian methods for complex and high dimensional data; Statistical Advances in Microbiome Research; ICSA 2023 Applied Statistics Symposium   Jun 2023
Session title: Statistical advances in high-dimensional and complex data analysis;   JSM 2023 topic-contributed program; Session Sponsor: Section on Bayesian Statistical Science   Aug 2023

Poster Session Judges

ICSA 2020 Applied Statistics Symposium   Dec 2020

Membership

American Statistical Association (ASA),   Jan 2013-present
Eastern North American Region (ENAR) International Biometric Society   Jan 2015-present
International Chinese Statistical Association (ICSA)   Oct 2019-present
International Society of Bayesian Analysis   Feb 2021-present