Wei Zong

Ph.D. in Biostatistics
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Education

UNIVERSITY OF PITTSBURGH *Pittsburgh, PA, US*

Ph.D. in Biostatistics, 2018 - 2023
Dissertation: Statistical Modeling for High-Dimensional Omics Studies for Congruence, Heterogeneity and Clustering
Advisor: Prof. George Tseng
GPA: 4.0; Qualifying Exam Rank: 1st

UNIVERSITY OF CAMBRIDGE *Cambridge, UK*

MASt in Mathematical Statistics, 2016 - 2017
Selective Courses: Modern Statistical Methods (e.g., Regularized Regression, SVM etc.), Bayesian Modelling and Computation, Applied Statistics (e.g., GLM, Mixed Effects Models, Nonparametric Regression etc.)
GPA: 4.0; Merit

HERIOT-WATT UNIVERSITY *Edinburgh, UK*

BSc in Actuarial Science, 2014 - 2016
GPA: 4.0; First class honors; Rank: 1/93

SOUTHWESTERN UNIVERSITY OF FINANCE AND ECONOMICS *Sichuan, China*

BEc in Bilingual Actuarial Science, 2012-2014
GPA: 4.0; Rank 1/67

Research Interests

Statistical machine learning, cluster analysis, high-dimensional data, Bayesian analysis, genomics and bioinformatics, scientific collaboration

Teaching Experience

2022 & 2023 **Teaching Fellow** UPitt, *Pittsburgh, PA*

BIOST 2094-Advanced R Computing (10-20 students)
Taught hybrid class in Spring 2022 and in-person class in Spring 2023 as a co-lecturer. Re-designed the curriculum to include advanced programming skills (parallel computing and Rcpp) and genomics analysis using R.

2002-2023 **Peer Mentor** UPitt, *Pittsburgh, PA*

Mentee (Ruofei Yin): 2th year MS student
Mentor the development of a methodological project investigating the strange association of library size and normalized expression level presented in many public RNA-Seq datasets. Teach omics data preprocessing and downstream analysis for collaborative projects.

Employment History

2023– **Biostatistician** Translational and Early Development, Sanofi Pasteur LLC, *Waltham, MA*

Provide statistical support to translational sciences and biomarker strategy for vaccine projects. Provide statistical training to scientists.

2018–2023 **Graduate Student Researcher** Department of Psychiatry, UPitt, *Pittsburgh, PA*

Provided statistical consulting to multiple investigators, focusing on high-throughput omics data analysis. Responsibilities included the full analysis pipeline, from preprocessing raw data to downstream statistical analysis. Contributed to multiple research projects exploring the link between psychiatric disorders (e.g., bipolar disorder, major depression, drug addiction) and the molecular circadian clock.

2020 **Statistician Intern** Oncology, Bayer U.S. LLC, *Whippany, NJ*

Designed and implemented Bayesian power calculation for GO/NO-GO/INDETERMINATE decisions of continuity to binary and continuous outcome proof-of-concept (PoC) trials. Developed a user-friendly R-shiny app for future internal use.

Grant Application Experience

2019-2020 **Co-Principal Investigator (NIH UL1TR001857)** UPitt, *Pittsburgh, PA*

Total Funding: $10,000
Title: Robust order-based machine learning framework on omics data for medical decisions. Applied as a co-PI for the CTSI Quantitative Methodologies Pilot Program Award

Publications

Note: Papers are listed in reverse chronological order by topic area. * indicates co-authorship.

Statistical Methodology

[1] **Wei Zong**, Danyang Li, Marianne L Seney, Colleen A Mcclung, and George C Tseng. Model-based multifacet clustering with high-dimensional omics applications. *Biostatistics*, 2024.

[2] Yujia Li*, Liu Peng*, Wenjia Wang*, **Wei Zong**, Yusi Fang, Zhao Ren, Lu Tang, Juan Celedon, Steffi Oesterreich, and George C Tseng. Outcome-guided disease subtyping by generative model and weighted joint likelihood in transcriptomic applications. *Annals of Applied Statistics*, pages 18:1947–1964, 2024.

[3] **Wei Zong**, Tanbin Rahman, Li Zhu, Xiangrui Zeng, Yingjin Zhang, Jian Zou, Song Liu, Zhao Ren, Jingyi Jessica Li, Etienne Sibille, et al. Transcriptomic congruence analysis for evaluating model organisms. *Proceedings of the National Academy of Sciences*, 120(6):e2202584120, 2023.

[4] **Wei Zong**, Marianne L Seney, Kyle D Ketchesin, Michael T Gorczyca, Andrew C Liu, Karyn A Esser, George C Tseng, Colleen A McClung, and Zhiguang Huo. Experimental design and power calculation in omics circadian rhythmicity detection using the cosinor model. *Statistics in Medicine*, 42(18):3236–3258, 2023.

[5] Xiangning Xue, **Wei Zong**, Zhiguang Huo, Kyle D Ketchesin, Madeline R Scott, Kaitlyn A Petersen, Ryan W Logan, Marianne L Seney, Colleen McClung, and George Tseng. Diffcircapipeline: a framework for multifaceted characterization of differential rhythmicity. *Bioinformatics*, 39(1):btad039, 2023.

[6] Xiangrui Zeng*, **Wei Zong***, Chien-Wei Lin, Zhou Fang, Tianzhou Ma, David A Lewis, John F Enwright, and George C Tseng. Comparative pathway integrator: A framework of meta-analytic integration of multiple transcriptomic studies for consensual and differential pathway analysis. *Genes*, 11(6):696, 2020.

Interdisciplinary Collaboration

[7] Megan S Perez, RuoFei Yin, Madeline R Scott, **Wei Zong**, Marianne L Seney, Xiangning Xue, Mariah A Hildebrand, Vaishnavi G Shankar, Jill R Glausier, David A Lewis, et al. Sex and regional differences in gene expression across the striatum in psychosis. *Translational Psychiatry*, 15(1):192, 2025.

[8] Lauren M DePoy, Kaitlyn A Petersen, **Wei Zong**, Kyle D Ketchesin, Ross C Matthaei, RuoFei Yin, Megan S Perez, Chelsea A Vadnie, Darius Becker-Krail, Madeline R Scott, et al. Cell-type and sex-specific rhythmic gene expression in the nucleus accumbens. *Molecular Psychiatry*, pages 1–11, 2024.

[9] Kaitlyn A Petersen, **Wei Zong**, Lauren M Depoy, Madeline R Scott, Vaishnavi G Shankar, Jennifer N Burns, Allison J Cerwensky, Sam-Moon Kim, Kyle D Ketchesin, George C Tseng, et al. Comparative rhythmic transcriptome profiling of human and mouse striatal subregions. *Neuropsychopharmacology*, 49(5):796–805, 2024.

[10] Kyle D Ketchesin*, **Wei Zong***, Mariah A Hildebrand, Madeline R Scott, Marianne L Seney, Kelly M Cahill, Vaishnavi G Shankar, Jill R Glausier, David A Lewis, George C Tseng, et al. Diurnal alterations in gene expression across striatal subregions in psychosis. *Biological psychiatry*, 93(2):137–148, 2023.

[11] Madeline R Scott, **Wei Zong**, Kyle D Ketchesin, Marianne L Seney, George C Tseng, Bokai Zhu, and Colleen A McClung. Twelve-hour rhythms in transcript expression within the human dorsolateral prefrontal cortex are altered in schizophrenia. *PLoS Biology*, 21(1):e3001688, 2023.

[12] Xiangning Xue, **Wei Zong**, Jill R Glausier, Sam-Moon Kim, Micah A Shelton, BaDoi N Phan, Chaitanya Srinivasan, Andreas R Pfenning, George C Tseng, David A Lewis, et al. Molecular rhythm alterations in prefrontal cortex and nucleus accumbens associated with opioid use disorder. *Translational Psychiatry*, 12(1):123, 2022.

[13] Darius D Becker-Krail, Kyle D Ketchesin, Jennifer N Burns, **Wei Zong**, Mariah A Hildebrand, Lauren M DePoy, Chelsea A Vadnie, George C Tseng, Ryan W Logan, Yanhua H Huang, et al. Astrocyte molecular clock function in the nucleus accumbens is important for reward-related behavior. *Biological psychiatry*, 92(1):68–80, 2022.

[14] Kyle D Ketchesin*, **Wei Zong***, Mariah A Hildebrand, Marianne L Seney, Kelly M Cahill, Madeline R Scott, Vaishnavi G Shankar, Jill R Glausier, David A Lewis, George C Tseng, et al. Diurnal rhythms across the human dorsal and ventral striatum. *Proceedings of the National Academy of Sciences*, 118(2):e2016150118, 2021.

[15] Marianne L Seney, Sam-Moon Kim, Jill R Glausier, Mariah A Hildebrand, Xiangning Xue, **Wei Zong**, Jiebiao Wang, Micah A Shelton, BaDoi N Phan, Chaitanya Srinivasan, et al. Transcriptional alterations in dorsolateral prefrontal cortex and nucleus accumbens implicate neuroinflammation and synaptic remodeling in opioid use disorder. *Biological psychiatry*, 90(8):550–562, 2021.

[16] Despoina Aslanoglou, Suzanne Bertera, Marta Sánchez-Soto, R Benjamin Free, Jeongkyung Lee, **Wei Zong**, Xiangning Xue, Shristi Shrestha, Marcela Brissova, Ryan W Logan, et al. Dopamine regulates pancreatic glucagon and insulin secretion via adrenergic and dopaminergic receptors. *Translational psychiatry*, 11(1):59, 2021.

[17] Ryan W Logan, Angela R Ozburn, Rachel N Arey, Kyle D Ketchesin, Alicia Winquist, Andrew Crain, Brian TD Tobe, Darius Becker-Krail, Matthew B Jarpe, Xiangning Xue, **Wei Zong**, et al. Valproate reverses mania-like behaviors in mice via preferential targeting of hdac2. *Molecular psychiatry*, 26(8):4066–4084, 2021.

[18] Lauren M DePoy, Darius D Becker-Krail, **Wei Zong**, Kaitlyn Petersen, Neha M Shah, Jessica H Brandon, Alyssa M Miguelino, George C Tseng, Ryan W Logan, and Colleen A McClung. Circadian-dependent and sex-dependent increases in intravenous cocaine self-administration in npas2 mutant mice. *Journal of Neuroscience*, 41(5):1046–1058, 2021.

[19] Marianne L Seney, Kelly Cahill, John F Enwright III, Ryan W Logan, Zhiguang Huo, **Wei Zong**, George Tseng, and Colleen A McClung. Diurnal rhythms in gene expression in the prefrontal cortex in schizophrenia. *Nature communications*, 10(1):3355, 2019.

Awards and Honors

2022 ASA Biopharmaceutical Student Travel Grant. *Evaluated by a committee composed of members from industry, the FDA, and academia.*

2022 Outstanding Graduate Student Researcher. *Awarded by the Department of Biostatistics (UPitt) for excellent collaborative work.*

2021 Dean's Day Biostatistics Doctoral Award. *Awarded by the School of Public Health (UPitt) for poster presentation on Dean's day.*

2016 The Roger Gray Memorial Prize of Statistics. *Awarded by the Department of Actuarial Mathematics and Statistics (HW) to the best Senior year student.*

2015 University Prize and Scottish Widows Prize. *Awarded by the Department of Actuarial Mathematics and Statistics (HW) to the best Junior year student.*

2013, 2014 Academic Excellence Scholarship-First Prize. *Awarded for excellent academic performance (SWUFE).*

Presentations

2022 ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop. *"Multivariate clinical variable guided disease subtyping"*

2022 Symposium on Data Science & Statistics. *"CAMO: A molecular congruence analysis framework for evaluating model organisms"*

2022 ASA Pittsburgh Chapter Spring Banquet. *"CAMO: A molecular congruence analysis framework for evaluating model organisms"*

2021 Dean's Day Competition. *"Diurnal rhythms across the human dorsal and ventral striatum"*

References

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