ZHIGUANG (CALEB) HUO

2004 Mowry Road, 5th Floor CTRB, P.O. Box 117450, Gainesville, FL 32611-7450
(352)-294-5929 ◇ zhuo@ufl.edu
https://caleb-huo.github.io

EDUCATION

University of Pittsburgh, Pittsburgh, PA, US

- Ph.D. in Biostatistics, *April 2017*
  - Dissertation: *Statistical integrative omics methods for disease subtype discovery*
  - GPA: *3.93/4.00*
  - Advisors: George C. Tseng, ScD and Yong Seok Park, PhD
- M.S. in Physics, *Apr 2012*
  - *GPA: 3.86/4.00*

Harbin Institute of Technology, Harbin, Heilongjiang, China

- B.S. in Physics, *June 2011*
  - GPA: *90.43/100*

RESEARCH INTEREST

My research interest lies in the intersection between statistical methodology and its applications to genomics and bioinformatics. I am particularly interested in genomic data integration, models and variable selection in high-dimensional data, graphical models, Bayesian methods, optimization and statistical computing. I have collaborated with biologists in the fields of cancer and psychiatry, analyzing a broad range of genomic data. These experiences motivate me to develop methodology and software that are practical, user-friendly and easy to use.

PROFESSIONAL EXPERIENCE

- Director of the Biostatistics Consulting Lab *Sep 2017 ∼ Now*
  - Department of Biostatistics, University of Florida
- Assistant Professor *July 2017 ∼ Now*
  - Department of Biostatistics, University of Florida

PUBLICATIONS

2017

1. **Zhiguang Huo**, Shaowu Tang, Yongseok Park*, George Tseng*. (2017) P-value evaluation, variability index and biomarker categorization for adaptively weighted Fisher's meta-analysis method in omics applications. (Submitted)
2. Marianne Seney, **Zhiguang Huo**, Leon French, Rachel Puralewski, Joyce Zhang, David A Lewis, George Tseng, Etienne Sibille. (2017) Distinct molecular signatures of depression in men and women. (Submitted)
3. **Zhiguang Huo**, Chi Song, George C. Tseng. (2017) Bayesian latent hierarchical model for transcriptomic meta-analysis to detect biomarkers with clustered meta-patterns of differential expression signals. Submitted to *Annals of Applied Statistics* (under revision).
4. **Zhiguang Huo**, George C. Tseng. (2017) Integrative Sparse K-means with overlapping group lasso in genomic applications for disease subtype discovery. *The Annals of Applied Statistics*, 11(2), 1011-1039.

[0]Last modified: November 1, 2017

5. Dominique Arion, **Zhiguang Huo**, John F. Enwright, John P. Corradi, George Tseng and David A. Lewis. (2017) Transcriptome alterations in prefrontal pyramidal neurons distinguish schizophrenia from bipolar and major depressive disorders. *Biological Psychiatry*,
6. SungHwan Kim, Dongwan Kang, **Zhiguang Huo**, Yongseok Park, George C. Tseng. (2017) Meta-analytic principal component analysis in integrative omics application. (minor revision).
7. Abraham Apfel, **Zhiguang Huo**, George Tseng and Stewart J. Anderson (2017) Achieving Accurate and Stable Feature Selection via Sparse K-means. (submitted)
8. Enwright, John, **Zhiguang Huo**, Dominique Arion, John Corradi, Aiqing He, George Tseng, and David Lewis. (2017) Transcriptome alterations of prefrontal cortical parvalbumin neurons in schizophrenia. (accepted).

2016

9. **Zhiguang Huo**, Ying Ding, Silvia Liu, Steffi Oesterreich, and George Tseng. Meta-Analytic Framework for Sparse K-Means to Identify Disease Subtypes in Multiple Transcriptomic Studies. *Journal of the American Statistical Association*, 111, no. 513 (2016): 27-42.
10. Zhu, Li, Ying Ding, Cho-Yi Chen, Lin Wang, **Zhiguang Huo**, SungHwan Kim, Christos Sotiriou, Steffi Oesterreich, and George C. Tseng. "MetaDCN: meta-analysis framework for differential co-expression network detection with an application in breast cancer." *Bioinformatics* (2016): btw788.

2015 and before

11. Silvia Liu, Wei-Hsiang Tsai, Ying Ding, Rui Chen, Zhou Fang, **Zhiguang Huo**, SungHwan Kim, Tianzhou Ma, Ting-Yu Chang, Nolan Michael Priedigkeit, Adrian V. Lee, Jianhua Luo, Hsei-Wei Wang, I-Fang Chung, George C. Tseng. (2015). Comprehensive evaluation of fusion transcript detection algorithms and a meta-caller to combine top performing methods in paired-end RNA-seq data. *Nucleic Acids Research*, 10.1093/nar/gkv1234.
12. Tiffany A. Katz, Serena G. Liao, Vincent J. Palmieri, Robert K. Dearth, Thushangi Pathiraja, **Zhiguang Huo**, Patricia Shaw, Sarah Small, Nancy E. Davidson, David G. Peters, George C. Tseng, Steffi Oesterreich, Adrian V. Lee. (2015) Targeted DNA Methylation Screen in the Mouse Mammary Genome Reveals a Parity-Induced Hypermethylation of IGF1R That Persists Long after Parturition. *Cancer Prevention Research* 8, no. 10 (2015): 1000-1009.
13. Yan P. Yu, Silvia Liu, **Zhiguang Huo**, Amantha Martin, Joel B. Nelson, George C. Tseng and Jian-Hua Luo. (2015) Genomic copy number variations in the genomes of leukocytes predict prostate cancer clinical outcomes. *PloS one*, 10(8):e0135982.
14. SungHwan Kim, **Zhiguang Huo**, YongSeok Park and George Tseng. (2015) MetaOmics: transcriptomic meta-analysis methods for biomarker detection, pathway analysis and other exploratory purposes. Book chapter in Integrating omics data: statistical and computational methods. Edited by George C. Tseng, Debashis Ghosh, Xianghong Jasmine Zhou. *Cambridge University Press*. Page 39-67.
15. Xingbin Wang, Dongwan Kang, Kui Shen, Chi Song, Shuya Lu, Lunching Chang, Serena G. Liao, **Zhiguang Huo**, Naftali Kaminski, Etienne Sibille, Yan Lin, Jia Li and George C. Tseng. (2012) A Suite of R Packages for Quality Control, Differentially Expressed Gene and Enriched Pathway Detection in Microarray Meta-analysis. *Bioinformatics*, 28:2534-2536.

Under preparation

- YongSeok Park, **Zhiguang Huo**, Shaowu Tang and George Tseng. (2017) Asymptotic properties of adaptive weighted Fisher's method.
- Li Zhu, **Zhiguang Huo**, Tianzhou Ma, George Tseng. (2017) Bayesian indicator variable selection model with multi-layer overlapping groups.
- Tianzhou Ma*, **Zhiguang Huo***, Anche Kuo*, Xiangrui Zeng, Li Zhu, Ark Fang, Lin Wang, Chien-Wei Lin, Tanbin Rahman, Shuchang Liu, YongSeok Park, Sunghwan Kim, Jia Li, Lun-

Ching Chang, Chi Song, George Tseng. (2017) MetaOmics - a Comprehensive Software Suite with Interactive Visualization for Transcriptomic Meta-Analysis. (∗: co-first author).

- George C. Tseng, **Zhiguang Huo** and Tianzhou Ma. (2017) Foundations for High-Throughput Omics Data Analysis: Methods, Theories and Applications. *Chapman & Hall/CRC*.

AWARD

Student Awards

- Delta Omega Membership — April 2017
- American Statistics Association (ASA) Pittsburgh chapter — March 2016
  - Student of the year
- Department of Physics, Harbin Institute of Technology — May 2009
  - National Scholarship of P.R. China.
    (Awarded to the top 2 students in my Bachelors degree.)

Travel Awards

- SAMSI Research Triangle Park, NC.
  - Interface of Statistics and Optimization — Feb 2017
  - Optimization Summer School — Aug 2016
  - Epigenetics Workshop — Mar 2015
  - Beyond Bioinformatics Workshop — June 2014

TEACHING EXPERIENCE (UNIVERSITY OF PITTSBURGH)

Main Lecturer (teaching fellow)

- BIOST2094 - Advanced R Computing – (with Tianzhou Ma) — Spring 2017
- BIOST2025 - Special Studies in Bayesian Data Analysis — Fall 2016
  - (with George Tseng, Tianzhou Ma and Li Zhu)

Guest Lecturer

- BIOST2055 - Introductory high-throughput genomic data analysis I: data mining and applications — Mar 2016
  - Differential and isoform analysis of RNA-seq data
- BIOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms — Dec 2015
  - Reproducible research and parallel computing in R
- BIOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms — Dec 2014
  - Reproducible research

Teaching Assistant

- BIOST 2078 - Introductory high-throughput genomic data analysis II: theories and algorithms — Fall 2014
- PHYS 0212 - Introduction to Laboratory Physics — Spring 2012
- PHYS 0212 - Introduction to Laboratory Physics — Fall 2011

PRESENTATIONS

Poster and Oral Presentation

- Poster, Dean's Day's competition, GSPH, University of Pittsburgh — April 2017
  - Circadian rhythms of gene expression in the human prefrontal cortex reveal distinct pattern between schizophrenia and control subjects

- Invited talk, University of Florida, Gainesville, FL Feb 2017
  - Meta-analytic and integrative framework for sparse ¡i¿K¡/i¿-means to identify disease subtypes.
- Poster, SAMSI optimization summer school, Research Triangle Park, NC Aug 2016
  - Integrative Sparse K-means for disease subtype discovery using multi-level omics data.
- Poster, Pittsburgh ASA banquet, Pittsburgh, PA Mar 2016
  - Integrative Sparse K-means for disease subtype discovery using multi-level omics data.
- Oral Presentation, JSM, Seattle, WA Aug 2015
  - Meta-analytic framework for sparse K-means to identify disease subtypes in multiple transcriptomic studies.
- Poster, Pittsburgh ASA banquet, Pittsburgh, PA Apr 2015
  - Meta-analytic framework for sparse K-means to identify disease subtypes in multiple transcriptomic studies.
- Oral Presentation, ENAR Conference, Miami, FL Mar 2015
  - Meta-analytic framework for sparse K-means to identify disease subtypes in multiple transcriptomic studies.
- Poster, Dean's Day's competition, GSPH, University of Pittsburgh Mar 2015
  - Discover and Characterize Invasive Lobular Breast Carcinoma Subtypes.
- Oral Presentation, ENAR Conference, Baltimore, MA Mar 2014
  - Meta-analytic framework for sparse K-means to identify disease subtypes in multiple transcriptomic studies.
- Poster, Dean's Day's competition, GSPH, University of Pittsburgh Mar 2014
  - Meta-analytic framework for sparse K-means to identify disease subtypes in multiple transcriptomic studies.

Seminar Talk

- Department of Biostatistics, University of Pittsburgh Nov 2015
  - How to use Latex to make slides

REVIEWER SERVICE

- PLOS ONE
- Scientific Reports
- Journal of the Royal Statistical Society Series C

MEMBERSHIP

- Member of International Chinese Statistical Association *Mar 2015 ∼ Now*
- Member of Eastern North American Region International Biometric Society *Oct 2013 ∼ Now*
- Member of American Statistical Association *Nov 2013 ∼ Now*

HOBBIES

Running, skiing, other endurance activities.

Running Record

- Bank of America Chicago Marathon, Chicago, IL. 10/09/2016
- First National Bank Pittsburgh Triathlon (Sprint), Pittsburgh, PA 08/14/2016
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA. 05/01/2016
- First National Bank Pittsburgh Triathlon (Olympic standard), Pittsburgh, PA 08/09/2015
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/03/2015
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/04/2014

- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/05/2013