

ZHIGUANG (CALEB) HUO

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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

2018

1. **Zhiguang Huo***, Li Zhu, Tianzhou Ma, Li Zhu, Song Han, Daiqing Liao, Jinying Zhao and George Tseng* (2018). Two-way Horizontal and Vertical Omics Integration for Disease Subtype Discovery. (Submitted) (*: co-corresponding author).
2. Tianzhou Ma*, **Zhiguang Huo***, Anche Kuo*, Li Zhu, Fang Zhou, Xiangrui Zeng, Chien-Wei Lin, Silvia Liu, Lin Wang, Tanbin Rahman, Lun-Ching Chang, Sunghwan Kim, Jia Li, Yongseok Park, Chi Song and George C. Tseng. (2018). MetaOmics - Comprehensive Analysis Pipeline and Web-based Software Suite for Transcriptomic Meta-Analysis. (Submitted) (*: co-first author).
3. **Zhiguang Huo**, Shaowu Tang, Yongseok Park, George Tseng. (2018) P-value evaluation, variability index and biomarker categorization for adaptively weighted Fisher's meta-analysis method in omics applications. (Submitted)

⁰Last modified: January 11, 2018

4. Marianne Seney, **Zhiguang Huo**, Kelly Cahill, Leon French, Rachel Puralewski, Joyce Zhang, George Tseng, David A Lewis, Etienne Sibille. (2018) Opposite molecular signatures of depression in men and women. *Biological Psychiatry* (Minor revision)
5. **Zhiguang Huo**, Chi Song, George C. Tseng. (2018) 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).

2017

6. SungHwan Kim, Dongwan Kang, **Zhiguang Huo**, Yongseok Park, George C. Tseng. (2017) Meta-analytic principal component analysis in integrative omics application. *Bioinformatics*, 1, 8.
7. 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. *Molecular Psychiatry*.
8. **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.
9. 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*.

2016

10. **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.
11. 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

12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
- 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

- 2018 ASA Biometrics Section JSM Travel Award, Vancouver, BC, Canada. Aug 2018
- Objective Bayes meeting 2017 travel award, Austin, TX. Dec 2017
- 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

Lecturer, University of Florida

- PHC6068 - Biostatistical computing Fall 2017

Main Lecturer (teaching fellow), University of Pittsburgh

- BOST2094 - Advanced R Computing – (with Tianzhou Ma) Spring 2017
- BOST2025 - Special Studies in Bayesian Data Analysis Fall 2016
 - (with George Tseng, Tianzhou Ma and Li Zhu)

Guest Lecturer, University of Pittsburgh

- BOST2055 - Introductory high-throughput genomic data analysis I: data mining and applications Mar 2016
 - Differential and isoform analysis of RNA-seq data
- BOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms Dec 2015
 - Reproducible research and parallel computing in R
- BOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms Dec 2014
 - Reproducible research

Teaching Assistant, University of Pittsburgh

- 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, Objective Bayes meeting 2017, University of Texas, Austin, TX Dec 2017
 - Bayesian latent hierarchical model for transcriptomic meta-analysis to detect biomarkers with clustered meta-patterns of differential expression signals
- 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 K -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 (2)
- Scientific Reports (2)
- Journal of the Royal Statistical Society Series C (1)
- Bioinformatics (1)

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

- Five Points of Life Race Marathon, Gainesville, FL. 2/18/2018
- 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