

## Zhiguang Huo

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CONTACT INFORMATION	4600 Bayard ST, APT 308 Pittsburgh, PA 15213	412-979-0592 <a href="mailto:zh18@pitt.edu">zh18@pitt.edu</a>
RESEARCH INTERESTS	Omics data integration, Machine learning and statistical learning, Genomics and epigenetics algorithms and applications, Bioinformatics, Optimization, Graphical model	
EDUCATION	<b>University of Pittsburgh</b> , Pittsburgh, PA, US  Ph.D., Biostatistics, <i>Expected</i> : Summer 2017 <ul style="list-style-type: none"><li>• Thesis Topic: <i>Statistical integrative omics methods for disease subtype discovery and single cell methylation methods</i></li><li>• GPA: 3.93/4.00</li><li>• Advisors: George C. Tseng, ScD and Yong Seok Park, PhD</li></ul> M.S., Physics, Apr 2012 <ul style="list-style-type: none"><li>• GPA: 3.86/4.00</li></ul> <b>Harbin Institute of Technology</b> , Harbin, Heilongjiang, China  B.S., Physics, June 2011 <ul style="list-style-type: none"><li>• GPA: 90.43/100</li></ul>	
RESEARCH EXPERIENCE	<b>Research Assistant</b>	Dec 2011 to present
	Department of Biostatistics, University of Pittsburgh Supervisor: George C. Tseng, ScD	
	<b>Research Assistant</b>	Aug 2014 to present
	Department of Biostatistics, University of Pittsburgh Supervisor: Yong Seok Park, PhD	
	<b>Collaboration</b>	Feb 2016 to present
	Department of Psychiatry, University of Pittsburgh Supervisor: George C. Tseng, ScD Collaborator: Colleen A. McClung, Ph.D, Marianne Seney, PhD, Ryan Logan, PhD	
	<b>Collaboration</b>	Oct 2015 to present
	Department of Pediatrics, University of Pittsburgh Supervisor: George C. Tseng, ScD Collaborator: Nader Shaikh , MD, MPH	
	<b>Collaboration</b>	Jul 2014 to Feb 2016
	Department of Psychiatry, University of Pittsburgh Supervisor: George C. Tseng, ScD Collaborator: David A. Lewis, MD, John F. Enwright, Ph.D., Dominique Arion, Ph.D.	
	<b>Collaboration</b>	Jul 2014 to Sep 2015
	Department of Pharmacology and Chemical Biology, Magee-Womens Research Institute Supervisor: George C. Tseng, ScD Collaborator: Steffi Oesterreich, PhD	
	<b>Collaboration</b>	Jan 2013 to Sep 2014

Department of Pathology,  
University of Pittsburgh  
Supervisor: George C. Tseng, ScD Collaborator: Jianhua Luo, MD, PhD, Yan Ping  
Yu, MD, PhD

**Collaboration**

Dec 2012 to Nov 2013

Department of Anesthesiology and Neurobiology,  
University of Pittsburgh  
Supervisor: George C. Tseng, ScD Collaborator: William R. Lariviere, PhD

**Collaboration**

Mar 2012 to Aug 2012

Department of Environmental and Occupational Health,  
University of Pittsburgh  
Supervisor: George C. Tseng, ScD Collaborator: George D Leikauf, PhD

REFEREED  
JOURNAL  
PUBLICATIONS  
(STATISTICAL)

1. **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.

REFEREED  
JOURNAL  
PUBLICATIONS  
(APPLICATION)

1. Silvia Liu, Wei-Hsiang Tsai, Ying Ding, Rui Chen, Zhou Fang, **Zhiguang Huo**, SungHwan Kim, Tianzhou Ma, Ting-Yu Chang, Nolan Michael Friedigkeit, 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.
2. 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 igflr which persists long after parturition. *Cancer Prevention Research*, pages canprevres-0178.
3. 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.
4. Xingbin Wang, Dongwan Kang, Kui Shen, Chi Song, Shuya Lu, Luning 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.

SUBMITTED  
JOURNAL  
PUBLICATIONS (IN  
REVISION)

1. **Zhiguang Huo**, Chi Song, George C. Tseng. (2016) 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*.
2. **Zhiguang Huo**, George C. Tseng. (2016) Integrative Sparse  $K$ -means for disease subtype discovery using multi-level omics data. Submitted to *Annals of Applied Statistics*.
3. Dominique Arion, John Enwright, **Zhiguang Huo**, George Tseng and David A. Lewis. Transcriptome alterations in prefrontal pyramidal neurons distinguish schizophrenia from bipolar and major depressive disorders. Submitted to *Biological Psychiatry*.

SUBMITTED JOURNAL PUBLICATIONS	<ol style="list-style-type: none"> <li>1. SungHwan Kim, Dongwan Kang, <b>Zhiguang Huo</b>, Yongseok Park, George C. Tseng. (2016) Meta-analytic principal component analysis. Submitted to <i>Annals of Applied Statistics</i>.</li> <li>2. Li Zhu, Ying Ding, Cho-Yi Chen, Lin Wang, <b>Zhiguang Huo</b>, SungHwan Kim, Christos Sotiriou, Steffi Oesterreich and George C. Tseng. (2016) MetaDCN: meta-analysis framework for differential coexpression network detection with an application in breast cancer Submitted to <i>Bioinformatics</i>.</li> </ol>
PUBLISHED ABSTRACT	<ol style="list-style-type: none"> <li>1. Oesterreich, S., Katz, T.A., Logan, G., Levine, K., Nagle, A., <b>Huo, Z.</b>, Tseng, G.C., Rui, H., Lee, A.V. and Butler, L.M., 2016. Abstract PD2-08: Potential role of prolactin signaling in development and growth of the lobular subtype of breast cancer. <i>Cancer Research</i>, 76(4 Supplement), pp.PD2-08.</li> <li>2. Enwright, John, Dominique Arion, John Corradi, Aiqing He, <b>Zhiguang Huo</b>, George Tseng, and David Lewis. (2015) Transcriptome Profiling of Layer 3 Parvalbumin Neurons from the Dorsolateral Prefrontal Cortex of Schizophrenia Subjects. <i>NEUROPSYCHOPHARMACOLOGY</i>, vol. 40, pp. S400-S401.</li> </ol>
PAPERS IN PREPARATION	<ol style="list-style-type: none"> <li>1. John Enwright, Dominique Arion, <b>Zhiguang Huo</b>, George Tseng and David A. Lewis. Transcriptome alterations in layer 3 parvalbumin neurons in the dorsolateral prefrontal cortex in schizophrenia differ from those in layer 3 pyramidal cells.</li> <li>2. <b>Zhiguang Huo</b>, Shaowu Tang, YongSeok Park and George Tseng. Biomarker categorization and fast computing of adaptively weighted Fisher's method for meta-analysis in omics applications.</li> <li>3. MetaOmics software paper</li> </ol>
BOOK AND BOOK CHAPTER	<ol style="list-style-type: none"> <li>1. George C. Tseng, <b>Zhiguang Huo</b> and Tianzhou Ma. Foundations for High-Throughput Omics Data Analysis: Methods, Theories and Applications. Chapman &amp; Hall/CRC.</li> <li>2. <b>Zhiguang Huo</b>, Shaowu Tang, 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.</li> </ol>
AWARDS	<p>Student Awards – American Statistics Association (ASA) Pittsburgh chapter</p> <ul style="list-style-type: none"> <li>• Student of the year March 2016</li> </ul> <p>Travel Awards – SAMSI Research Triangle Park, NC</p> <ul style="list-style-type: none"> <li>• Optimization Summer School Aug 2016</li> <li>• Epigenetics Workshop Mar 2015</li> <li>• Beyond Bioinformatics Workshop June 2014</li> </ul> <p>Student Awards – Department of Physics, Harbin Institute of Technology</p> <ul style="list-style-type: none"> <li>• National Scholarship of P.R. China. May 2009 (Awarded to the top 2 students in my Bachelors degree.)</li> </ul>

PRESENTATIONS	<b>Statistical Meetings</b>
	<ul style="list-style-type: none"> <li>• Poster, SAMSI optimization summer school, Research Triangle Park, NC Aug 2016 Topic: Integrative Sparse <math>K</math>-means for disease subtype discovery using multi-level omics data.</li> <li>• Poster, Pittsburgh ASA banquet, Pittsburgh, PA Mar 2016 Topic: Integrative Sparse <math>K</math>-means for disease subtype discovery using multi-level omics data.</li> <li>• Oral Presentation, JSM, Seattle, WA Aug 2015 Topic: Meta-analytic framework for sparse <math>K</math>-means to identify disease subtypes in multiple transcriptomic studies.</li> <li>• Poster, Pittsburgh ASA banquet, Pittsburgh, PA Apr 2015 Topic: Meta-analytic framework for sparse <math>K</math>-means to identify disease subtypes in multiple transcriptomic studies.</li> <li>• Oral Presentation, ENAR Conference, Miami, FL Mar 2015 Topic: Meta-analytic framework for sparse <math>K</math>-means to identify disease subtypes in multiple transcriptomic studies.</li> <li>• Poster, Dean's Day's competition, GSPH, University of Pittsburgh Mar 2015 Topic: Discover and Characterize Invasive Lobular Breast Carcinoma Subtypes.</li> <li>• Oral Presentation, ENAR Conference, Baltimore, MA Mar 2014 Topic: Meta-analytic framework for sparse <math>K</math>-means to identify disease subtypes in multiple transcriptomic studies.</li> <li>• Poster, Dean's Day's competition, GSPH, University of Pittsburgh Mar 2014 Topic: Meta-analytic framework for sparse <math>K</math>-means to identify disease subtypes in multiple transcriptomic studies.</li> </ul>
	<b>Department of Biostatistics, University of Pittsburgh</b>
	<ul style="list-style-type: none"> <li>• Seminar talk (How to use Latex to make slides) Nov 2015</li> </ul>
TEACHING EXPERIENCE	<b>Guest lecture</b>
	<ul style="list-style-type: none"> <li>• Guest lecture on BIOST 2021 - Special Studies in Bayesian Data Analysis Nov 2016 (TBD)</li> <li>• Guest lecture on BIOST2055 - Introductory high-throughput genomic data analysis I: data mining and applications Mar 2016 (Differential and isoform analysis of RNA-seq data )</li> <li>• Guest lecture on BIOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms Dec 2015 (Reproducible research and parallel computing in R)</li> <li>• Guest lecture on BIOST2078 - Introductory high-throughput genomic data analysis II: theories and algorithms Dec 2014 (Reproducible research)</li> </ul>
	<b>Teaching assistant</b>
	<ul style="list-style-type: none"> <li>• BIOST 2078 - Introductory high-throughput genomic data analysis II: theories and algorithms Sep 2014 - Dec 2014 with George C. Tseng Department of Biostatistics, University of Pittsburgh</li> <li>• PHYS 0212 - Introduction to Laboratory Physics Jan 2012 - Apr 2012 with Russell J. Clark Department of Physics and Astronomy, University of Pittsburgh</li> <li>• PHYS 0212 - Introduction to Laboratory Physics Aug 2011 - Dec 2011 with Russell J. Clark Department of Physics and Astronomy, University of Pittsburgh</li> </ul>
REFERENCES	George C. Tseng

Professor	Phone: 412-624-5318
Department of Biostatistics (primary appointment)	
Department of Human Genetics	
Department of Computational & Systems Biology	E-mail: <a href="mailto:ctseng@pitt.edu">ctseng@pitt.edu</a>
University of Pittsburgh	

Yong Seok Park	
Assistant Professor	Phone: 412-624-3028
Department of Biostatistics	E-mail: <a href="mailto:yongpark@pitt.edu">yongpark@pitt.edu</a>
University of Pittsburgh	

#### SKILLS

##### Computer Programming:

- R (4 years),
- Linux (4 years),
- Matlab (2 year),
- Python (1 year),
- Java, C++, C (0.5 year).

#### RUNNING

- Chicago Marathon, Chicago, IL 10/09/2016  
coming soon...
- First National Bank Pittsburgh Triathlon (Sprint), Pittsburgh, PA 08/14/2015  
TIME 1:10:30 (only biking + running)
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/01/2016  
TIME 3:58:46
- First National Bank Pittsburgh Triathlon (Olympic standard), Pittsburgh, PA 08/09/2015  
Time 3:29:24
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/03/2015  
TIME 3:49:38
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/04/2014  
TIME 4:07:44
- Dick's Sporting Goods Pittsburgh Marathon, Pittsburgh, PA 05/05/2013  
TIME 4:48:49