
TIANZHOU (CHARLES) MA

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<https://matianzhou.github.io/>

EDUCATION

University of Pittsburgh,

Pittsburgh, PA, US

- Ph.D. in Biostatistics, *April 2018*
 - GPA: *3.98/4.00*
 - Thesis: *Differential expression and feature selection in the analysis of multiple omics studies.*
 - Advisors: George C. Tseng, ScD and Zhao Ren, PhD

Yale University,

New Haven, CT, US

- M.S. in Biostatistics, *May 2013*
 - GPA: *Honors*
 - Thesis: *Incorporating functional annotation information in prioritizing disease associated SNPs from genome wide association studies.*
 - Advisor: Hongyu Zhao, PhD

University of Toronto,

Toronto, ON, Canada

- Honours B.Sc. in Genes, Genetics and Biotechnology (specialist), *June 2010*
 - GPA: *3.93/4.00*
 - *with High Distinction (Summa Cum Laude)*

RESEARCH INTEREST

My research interest lies in the intersection between statistical methodology and its applications to multi-omics (e.g. genotyping, gene expression, epigenomics, proteomics, etc.) and bioinformatics. In particular, I am interested in omics data integration and meta-analysis, Bayesian modeling, high-dimensional variable selection, general statistical learning, and software development for general bioinformatic problems. In addition to methodology development, I have also collaborated with researchers in the cancer field (e.g. breast cancer and ovarian cancer), psychiatry and epidemiology for data analysis and motivation of new methodology.

PROFESSIONAL EXPERIENCE

- Assistant Professor

Aug 2018 ~ Now

- Department of Epidemiology and Biostatistics, University of Maryland College Park

PUBLICATIONS

2018

1. **Tianzhou Ma**, Zhao Ren and George C. Tseng. (2018). Variable screening with multiple studies. *Statistica Sinica*. Accepted.
2. Zhou Fang, **Tianzhou Ma**, Li Zhu, Qi Yan, Wei Chen, Gong Tang and George C. Tseng. (2018). A Bayesian Model for Integrating High-Throughput Multi-Omics Data with Missingness Handling. *Bioinformatics*. Accepted.

⁰Last modified: October 16, 2018

3. **Tianzhou Ma***, Zhiguang Huo*, Anche Kuo*, Li Zhu, Zhou Fang, Xiangrui Zeng, Chien-Wei Lin, Silvia Liu, Lin Wang, Peng Liu, 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. *Bioinformatics*. Accepted. (*co-first author).
4. Grabosch S, Bulatovic M, Zeng F, **Ma T**, Zhang L, Ross M, Brozick J, Fang Y, Tseng G, Kim E, Gambotto A, Elishaev E, Edwards R and Vlad, A. *Oncogene*. Accepted.
5. Li Zhu, Zhiguang Huo, **Tianzhou Ma**, George Tseng. (2018). Bayesian indicator variable selection model with multi-layer overlapping groups. Under revision in *Annals of Applied Statistics*. (a preliminary version won the ENAR distinguished student paper award).
6. Zhiguang Huo, Li Zhu, **Tianzhou Ma**, Hongcheng Liu, Song Han, Daiqing Liao, Jinying Zhao and George Tseng. (2018). Two-way Horizontal and Vertical Omics Integration for Disease Subtype Discovery. Under revision in *Statistics in Biosciences*.
7. Andersen CL, Boisen MM, Sikora MJ, **Ma T**, Tseng G, Suryawanshi S, Vlad AM, Elishaev E, Edwards RP and Oesterreich S. (2018). The evolution of estrogen receptor signaling in the progression of endometriosis to endometriosis-associated ovarian cancer. Submitted to *Cancer*.
8. Luo J, Liu S, Tao J, Ren B, Chen Z, Li F, Nalesnik M, **Ma T**, Cieply K, Cheng S, Chen Q, Michalopoulos GK, Nelson JB, Hamilton R, Bhargava R, Pennathur A, Luketich JD, Monga SP, Tseng G and Yu Y. (2018). Oncogenic Gene Fusion and Chromosome Rearrangement of *Pten-NOLC1* in Human Cancers. Submitted to *Science*.

2017

9. **Tianzhou Ma**, Faming Liang and George C. Tseng. (2017). Biomarker detection and categorization in ribonucleic acid sequencing meta-analysis using Bayesian hierarchical models. *Journal of the Royal Statistical Society: Series C*, 66(4): 847-867. (won ASA Section on Bayesian Statistical Science (SBSS) student paper award to attend 2017 JSM, reported on RNA-Seq Blog)
10. **Tianzhou Ma**, Faming Liang, Steffi Oesterreich and George C. Tseng. (2017). A Joint Bayesian Model for Integrating Microarray and RNA Sequencing Transcriptomic Data. *Journal of Computational Biology*, 24(7): 647-662. (selected to present at Dahshu Data Science Symposium: Computational Precision Health 2017 and won the best paper award)
11. **Tianzhou Ma**, Chi Song and George C. Tseng. (2017). Discussant paper on "Statistical contributions to bioinformatics: Design, modelling, structure learning and integration". *Statistical Modelling*, 17(4-5): 305-315.
12. Scifo E, Pabba M, Kapadia F, **Tianzhou Ma**, Lewis DA, Tseng GC and Sibille E. (2017). Sustained molecular pathology across episodes and remission in depression. *Biological Psychiatry*, 83(1): 81-89.
13. Andersen CL, Sikora MJ, Boisen MM, **Ma T**, Christie A, Tseng G, Park Y, Luthra S, Chandran U, Haluska P, Mantia-Smaldone GM, Odunsi K, McLean K, Lee AV, Elishaev E, Edwards RP and Oesterreich S. (2017). Active estrogen receptor- α signaling in ovarian cancer models and clinical specimens. *Clinical Cancer Research*, 23(14): 3802-3812. PMID: 28073843.
14. Linkov F, Goughnoura SL, **Ma T**, Xu Z, Edwards RP, Lokshin AE, Ramanathan RC, Hamad GG, McCloskey C and Bovbjerg DH. (2017). Changes in inflammatory endometrial cancer-associated biomarkers in individuals undergoing surgical weight loss. *Gynecologic Oncology*. Accepted. PMID: 28797697.
15. French L, **Tianzhou Ma**, Oh H, Tseng GC, and Sibille E. (2017). Age-related gene expression in the frontal cortex suggests synaptic function changes in specific inhibitory neuron subtypes. *Frontiers in aging neuroscience*, 9: 162. PMID: 28611654.
16. Pabba M, Scifo E, Kapadia F, Nikolova YS, **Ma T**, Mechawar N, Tseng GC and Sibille E. (2017). Resilient protein co-expression network in male orbitofrontal cortex layer 2/3 during human aging. *Neurobiology of Aging*, 58: 180-190. PMID: 28750307.
17. Grabosch S, Tseng G, Edwards RP, Lankes HA, Moore K, Odunsi K, Vlad A, **Ma T**, Strange M, Brozick J, Lugade A, Omilian A, Bshara W, Stuckey AR, Walker JL and Birrer M. (2017). Multi-

plex profiling identifies distinct local and systemic alterations during intraperitoneal chemotherapy for ovarian cancer: An NRG Oncology/Gynecologic Oncology Group Study. *Gynecologic Oncology*, 146(1):137-145. PMID: 28483269.

2016

18. 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. (2016). 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*, 44(5):e47.
19. Zhang L, **Ma T**, Brozick J, Babalola K, Budiu R, Tseng G and Vlad AM. (2016). Effects of Kras activation and Pten deletion alone or in combination on MUC1 biology and epithelial to mesenchymal transition in ovarian cancer. *Oncogene*, 35(38): 5010-20. PMID: 26973247.
20. Chen CY, Logan RW, **Ma T**, Lewis DA, Tseng GC, Sibille E and McClung CA. (2016). Effects of aging on circadian patterns of gene expression in the human prefrontal cortex. *Proceedings of the National Academy of Sciences*, 113(1): 206-21. PMID: 26699485. (High Attention Paper, 99th percentile, News on National Public Radio (NPR))
21. Sanei-Moghaddam A, **Ma T**, Goughnour SL, Edwards RP, Lounder PJ, Ismail N, Comerci JT, Mansuria SM and Linkov F. (2016). Changes in hysterectomy trends after the implementation of a clinical pathway. *Obstetrics & Gynecology*, 127(1), 139-147. PMID: 26646126.

2015 and before

22. Mony JT, Zhang L, **Ma T**, Grabosch S, Tirodkar TS, Brozick J, Tseng G, Elishaev E, Edwards RP, Huang X and Vlad AM. (2015). Anti-PD-L1 prolongs survival and triggers T cell but not humoral anti-tumor immune responses in a human MUC1-expressing preclinical ovarian cancer model. *Cancer Immunology, Immunotherapy*, 64(9):1095-108. PMID: 25998800.
23. Liao S, Hartmaier RJ, McGuire KP, Puhalla SL, Luthra S, Chandran UR, **Ma T**, Bhargava R, Davidson NE, Benz S, Lee AV, Tseng GC and Oesterreich S. (2015). The molecular landscape of premenopausal breast cancer. *Breast Cancer Research*, 17(1): 1-13. PMID: 26251034. (discussed in an interview; *Nature*, 527: S108-109)
24. Suryawanshi S, Huang X, Elishaev E, Budiu RA, Zhang L, Kim S, Donnellan N, Mantia-Smaldone G, **Ma T**, Tseng G, Lee T, Mansuria S, Edwards RP and Vlad AM. (2014). Complement Pathway Is Frequently Altered in Endometriosis and Endometriosis-Associated Ovarian Cancer, *Clinical Cancer Research*, 20(23): 6163-6174. PMID: 25294912.
25. Lin Hou*, **Tianzhou Ma*** and Hongyu Zhao. (2014). Incorporating functional annotation information in prioritizing disease associated SNPs from genome wide association studies. *Science China Life Sciences*, 57(11), 1072-1079. (*co-first author)

Ready to submit, In preparation

26. **Tianzhou Ma**, Tanbin Rahman, Li Zhu, Xiangrui Zeng, Jingyi J. Li and George C. Tseng. (2018). Poorly mimic or greatly mimic? A model-based evaluation with functional characterization for comparison of differential transcriptomic systems across model organisms or across species. Ready to submit.
27. Zhou Fang, Chien-wei Lin, Xiangrui Zeng, **Tianzhou Ma**, George C. Tseng. (2018). Comparative Pathway Integrator: a framework of meta-analytic integration of multiple transcriptomic studies for consensual and differential pathway analysis. Ready to submit.
28. Tanbin Rahman*, **Tianzhou Ma*** and George C. Tseng. (2018). Penalized likelihood approach for the clustering of RNA-seq count data. Ready to submit. (*co-first author).
29. Lin C, Chang L, **Tianzhou Ma**, Oh, H, Lewis D, Tseng GC and Sibille E. (2018). Genetic Modulation of Brain Molecular Aging. In preparation.
30. Seney M, French B, **Ma T**, Tseng G, Sibille E and Lotrich F. (2018). Interferon-alpha can worsen anhedonic behavior, with correlated changes in transcripts related to mTOR signaling. In

preparation.

Book

31. George C. Tseng, Zhiguang Huo and **Tianzhou Ma**. Foundations for High-Throughput Omics Data Analysis: Methods, Theories and Applications. *Chapman & Hall/CRC*. In preparation and expected in 2018.

AWARDS

Student Awards

- Delta Omega Honorary Society in Public Health Apr 2018
 - Delta Omega Membership
- ASA Section on Bayesian Statistical Science (SBSS) Aug 2017
 - Student Paper Award
- American Statistics Association (ASA) Pittsburgh chapter Apr 2017
 - Student of the Year
- Dahshu Data Science Symposium: Computational Precision Health 2017 Feb 2017
 - Best Paper Award
- Department of Biostatistics, University of Pittsburgh
 - Best Student Presentation Award Apr 2017
 - Outstanding Graduate Student Researcher Award Apr 2016
- Graduate School of Public Health, University of Pittsburgh Apr 2015
 - Dean's Day Poster Competition Award
- Faculty of Arts and Science, University of Toronto
 - Three consecutive years on Dean's list 2008-2010
- University College, University of Toronto 2008-2010
 - Three consecutive years' recipient of University College Scholarship

Travel Awards

- SAMSI, Research Triangle Park, NC.
 - Travel Award to attend "Optimization Opening Workshop" Aug 2016

TEACHING EXPERIENCE

- **Lecturer, University of Pittsburgh**
 - BIOST2094: Advanced R Computing (with Zhiguang Huo; 16 students) Spring 2017
 - BIOST2025: Special Studies in Bayesian Data Analysis (with George Tseng, Zhiguang Huo and Li Zhu; 23 students) Fall 2016
 - BIOST2094: Statistical Computing in R (21 students) Spring 2015
- **Guest Lecturer, University of Pittsburgh**
 - BIOST2078: Introductory high-throughput genomic data analysis II: theories and algorithms: *Selected Bayesian Methods in Genomic Studies* Dec 2015
- **Teaching Assistant, University of Pittsburgh and Yale University**
 - BIOST 2078: Introductory high-throughput genomic data analysis II: theories and algorithms Fall 2015
 - IMED 645: Introduction to Biostatistics, Yale University School of Medicine Summer 2012

PRESENTATIONS

Poster and Oral Presentation

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- Oral Presentation, JSM 2017, Baltimore, MD Aug 2017
– Biomarker detection and categorization in RNA-seq meta-analysis using Bayesian hierarchical model.
 - Oral Presentation, ENAR 2017 Spring meeting, Washington, DC March 2017
– Biomarker detection and categorization in RNA-seq meta-analysis using Bayesian hierarchical model.
 - Oral Presentation, Dahshu Data Science Symposium: Computational Precision Health 2017, San Francisco, CA Feb 2017
– A joint Bayesian modeling for integrating microarray and RNA-seq transcriptomic data.
 - Oral Presentation, JSM 2016, Chicago, IL Aug 2016
– Biomarker detection and categorization in RNA-seq meta-analysis using Bayesian hierarchical model.
 - Poster, ASA Spring Banquet, Pittsburgh, PA April 2016
– A Bayesian hierarchical model for RNA-seq meta-analysis and biomarkers categorization by study heterogeneity.
 - Poster, GSPH Dean's day competition, University of Pittsburgh April 2016
– Disrupted circadian rhythms at the molecular level in Bipolar disorder (BP) and Schizophrenia (SCZ).
 - Poster, ENAR 2017 Spring meeting, Austin, TX March 2016
– A Bayesian hierarchical model for RNA-seq meta-analysis and biomarkers categorization by study heterogeneity.
 - Oral Presentation, 5th Annual Women's Cancer Research Center (WCRC) Retreat, Nemacolin Woodlands Resort, PA Nov 2015
– Immune gene signature pairs predict survival in immune-reactive cancer patients: a Pan-cancer analysis.
 - Poster, GSPH Dean's day competition, University of Pittsburgh April 2015
– Cross-species Gene Expression Analysis: In what functional domains do mouse models predict human disease on a molecular basis?

Invited Talk

- Department of Epidemiology and Biostatistics, University of Maryland College Park Dec 2017
– Differential expression analysis in multiple omics studies.
- Statistical Genetics/Genomes Lab, University of Pittsburgh Dec 2015
– A Bayesian hierarchical model for RNA-seq meta-analysis and biomarkers categorization by study heterogeneity.

PROFESSIONAL SERVICE

Referee of Journals

- *PLOS One*, *PLOS Computational Biology*, *Annals of Applied Statistics*, *Genome Medicine*, *BMC Bioinformatics*

Service to the Profession

- 2016-2018, American Statistical Association Pittsburgh Chapter Student Representative

CONFERENCES AND WORKSHOPS

- 2016-2017 JSM.
- 2014-2017 ENAR Spring meeting.
- 2017 Summer Short Course on Causal Discovery and Datathon, Pittsburgh, PA. June 2017
- 3rd Annual Statistical Methods in Imaging Conference, Pittsburgh, PA. May 2017

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- Computational Precision Health 2017, San Francisco, CA. Feb 2017
 - 5th Annual WCRC Retreat, Nemacolin Woodlands Resort, PA. Nov 2015

PROGRAMMING AND SOFTWARES

- R, SAS, Stata, C++, Python, UNIX shell scripting and others.

MEMBERSHIP

- Member of American Statistical Association *Sep 2013 ~ Now*
- Member of Eastern North American Region International Biometric Society *Sep 2013 ~ Now*
- Member of International Chinese Statistical Association *Mar 2015 ~ Now*

HOBBIES

Writing, Playing basketball and soccer.