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EDUCATION

- Ph.D. in Mathematics, 2009, **Cornell University**, Ithaca, NY
  Ph.D. Dissertation: *Decision Approach and Shrinkage Confidence Intervals*
- B.S. in Mathematics, 2003, **Nankai University**, Tianjin, China

EMPLOYMENT

- Director of Graduate Programs, Temple University, 2019-present.
- Visiting Scholar, Department of Statistics, Harvard University, 2019
- Associate Professor, Department of Statistical Science, Temple University, 2016-present,
- Associate Professor, Center for Data Analytics and Biomedical Informatics (Secondary Appointment), Temple University, 2016-present,
- Charles E. Beury Research Fellow, Fox School of Business, Temple University, 2016-present,
- Assistant Professor, Department of Statistics, Temple University, 2009-2016,
- Visiting Scholar, Cornell University, May-August 2010,
- Research and Teaching Assistant, Cornell University, 2004-2009.

RESEARCH CONTRIBUTIONS

Statistical Methodology

1. Liao, Y., Xiang, Y., Zhao, Z. and Ai, D. (2022) Bayesian Mixed Effect Higher-Order Hidden Markov Models with Applications to Predictive Healthcare Using Electronic Health Records. Submitted.
2. Zhang, K., Zhao, Z., and Zhou, W. (2021) BEAUTY Powered BEAST. arXiv (All authors are equally contributed and listed alphebetically.) Submitted.
3. Sanat K. Sarkar, Zhao, Z. (2019) Local False Discovery Rate Based Methods for Multiple Testing of One-Way Classified Hypotheses. Submitted.
4. Kwon Y., Zhao, Z. (2022) On F-modelling based Empiricial Bayes Estimation of Variances. Biometrika. Accepted.
5. Zhao, Z. (2021) Where to find needles in a haystack? *TEST*. In Press.

6. Xing, X., Zhao, Z. and Liu, J. (2021) Controlling False Discovery Rate using Gaussian Mierrors. *Journal of the American Statistician Association.* In press.

7. Lin, Q., Zhao, Z., and Liu, J. (2021) Global testing under the sparse alternatives for single index models. Festschrift in Honor of R. Dennis Cook. In press.

8. Lin, Q., Zhao, Z. , and Liu, J. (2019) Sparse Sliced Inverse Regression via Lasso, *Journal of the American Statistician Association.* Vol. 114, Issue 528, 1726-1739.

9. Lin, Q., Zhao, Z., and Liu, J. (2018) On consistency and sparsity for sliced inverse regression in high dimension. *Annals of Statistics.* Vol. 46, No. 2, 580-610.

10. Chang, Y. W., Tsong, Y., and Zhao, Z. (2016) Sample size determination for a three-arm equivalence trial of Poisson and Negative binomial responses. *Journal of Biopharmaceutical Statistics.* Vol. 27, Issue 2, 239-256.

11. Liu, Y., Sarkar, S. K., and Zhao, Z. (2015) A new approach to multiple testing of grouped hypotheses. *Journal of Statistical Planning and Inference.* Vol. 179, 1-14. (One of the most downloaded articles from Journal of Statistical Planning and Inference in the last 90 days.)

12. Ji, P. and Zhao, Z. (2015) Rate optimal multiple testing procedure in high-dimensional regression. arXiv

13. He, L., Sarkar, S. K. and Zhao, Z. (2015) Capturing the severity of Type II errors in high-dimensional multiple testing. *Journal of Multivariate Analysis.* Vol. 142, 106-116.

14. Zhao, Z. and Sarkar, S. K. (2015) A Bayesian approach to construct multiple confidence intervals of selected parameters with sparse signals. *Statistica Sinica.* Volume 25, Number 2, 725-742.

15. Clements, N., Sarkar, S. K., Zhao, Z. and Kim, D. (2014) Applying multiple testing procedure to detect changes in east African vegetation. *Annals of Applied Statistics.* Volume 8, No.1, 286-308.

16. Chang, Y. W., Tsong, Y., Dong, X. and Zhao, Z. (2013) Sample size determination for a three-arm equivalence trial of normally distributed responses. Journal of Biopharmaceutical Statistics. *Journal of Biopharmaceutical Statistics.* Vol. 24, Issue 6, 1190-1202.

17. Zhao, Z., Wang, W. and Wei, Z. (2013) An empirical Bayes testing procedure for detecting variants in analysis of next generation sequencing data. *Annals of Applied Statistics.* Volume 7, No.4, 2229-2248.

18. Hwang, J. T., Zhao, Z. (2013) Empirical Bayes confidence intervals for selected parameters in high dimensional data. *Journal of the American Statistical Association.* Volume 108, Issue 502, 607-618.

19. Zhao, Z. and Hwang, J. T. (2012) Empirical Bayes FCR controlling confidence interval. *Journal of the Royal Statistical Society, Series B*, Volume 74, Issue 5, 871-891.

20. Zhao, Z. (2010) Double shrinkage empirical Bayesian estimation for unknown and unequal variances, *Statistics and Its Interface.* Volume 3, 533-541.

21. Hwang, J. T., Qiu, J. and Zhao, Z. (2009) Empirical Bayes confidence intervals shrinking both means and variances. *Journal of the Royal Statistical Society, Series B.* Volume **71**, Issue 1, 265-285.

Statistical Application

1. Zhang, J., Zhao, Z. , Zhang, K., and Wei, Z. (2019) A Feature Sampling Strategy for Analysis of High Dimensional Genomic Data. IEEE/ACM Transactions on Computational Biology and Bioinformatics. Vol. 16, No. 2, 434-441.

2. Ni, H., Qin, J., Zhou, L., Zhao, Z., Wang, J., Hou, F. (2017). Network analysis in detection of early-stage mild cognitive impairment. *Physica A: Statistical Mechanics and its Applications.* Vol. 142, 113-119.

3. Zhang, J., Zhao, Z. , Zhang, K., and Wei, Z. (2016) A Feature Sampling Strategy for Analysis of High Dimensional Genomic Data. APBC2017: The Fifteenth Asia Pacific Bioinformatics Conference.

4. Anis, M., Zhao, Z. , Khurana, J., Krynetskiy, E. and Soliman, A. (2017) Determining candidate single nucleotide polymorphisms in acquired laryngotracheal stenosis. The Laryngoscope Vol. 128, Issue 3, 111-116.

5. Anis, M., Zhao, Z., Khurana, J., Krynetskiy, E. and Soliman, A. (2014) Translational genomics of acquired laryngotracheal stenosis. *The Laryngoscope.* Vol. 124, Issue 5, 175-179.

GRANT

1. Principle Investigator. National Science Foundation. BIGDATA: Collaborative Research: F: Statistical Theory and Methods beyond the Dimensionality Barrier. 2016-2019. National Science Foundation IIS-1633283.

2. Co-Principle Investigator. Department of Transportation of State Pennsylvania. Winter Roadway Maintenance Material Enhancers (Field) Evaluation. 2016-2018.

3. Principle Investigator. National Science Foundation. *Bayesian Decision Theoretic Methods for Some High-Dimensional Multiple Inference Problems.* 2012-2015. National Science Foundation, DMS, 1208735.

PATENT

1. Methods, systems, and computer readable media for non-parametric dependence detection using bitwise operations in a computing system

SOFTWARE

1. R package: CLAT: Cdf and Local fdr Assisted multiple Testing method (CLAT)

2. R package: LassoSIR: Sparsed Sliced Inverse Regression via Lasso (LassoSIR)

3. R package: Multiple Testing Procedure for Grouped Hypotheses (GroupTest)

4. Bayesian LASSO with Zero Inflated Mixture Prior

5. EBVariant: An Empirical Bayes testing procedure for detecting variants in analysis of next generation sequencing data.

MENTORSHIP

I am serving as Ph.D. Dissertation Chair for

- Jian Sun. July 2019 - current.
- Tong Wang. July 2017 - current.
- Zhengkang Liang, July 2018 - current.
- Yu Tian. July 2017 - current.
- Yeil Kwon. 2015 - 2018. *Nonparametric empirical Bayes simultaneous estimation for multiple variances.* First position as a Tenure-Track Assistant Professor of Department of Mathematics, University of Central Arkansas.
- Yanping Liu, *New Approaches to Multiple Testing of Grouped Hypotheses.* Co-chaired with Dr. Sanat K. Sarkar. 2013 - 2016. First position in Merck.
- Victoria(Yu-Wei) Chang, *Sample Size Determination for a Three-arm Biosimilar Trial.* 2012 - 2014. First position in Boehringer Ingelheim.

Students' Awards

1. Yanping Liu, **ICSA Student Travel Award**, International Chinese Statistical Association Applied Statistics Symposium June, 2015
2. Yu-Wei Chang, **Josephs Heyse Publication Award**, Temple University April 2015
3. Yu-Wei Chang, **Poster Award Winner**, Nonclinical Biostatistics Conference October, 2013
4. Yu-Wei Chang, **Poster Award Winner**, DIA/FDA Statistics Forum April, 2013

I am serving as a member of Advisory Committees for

• Hailey Park • Mengtian Li • Lanyu Lei • Michale D Power • Shinjini Nandini • Chao Han (Computer Science, Temple University) • Yanhui Xu • Zeda Li • Scott Bruce • Jie Zhang (Computer Science, NJIT) • Jelena Gligorijevic • Hang Kim • Kun Tang • Jing Xiao• Bu Hyoung Lee• Yiyong Fu• Yihuan Xu• Wei Wang (NJIT) • Nicolle Clements• Ibrahim Turkoz• Elizabeth Stone• Bhramori Banerjee• Li He• Tingting Zhan• Vishwanath Iyer

TEACHING

Graduate Course

- Stat8112, 8113, Statistical Methods in Business Research I, II
- Stat8003, Statistical Methods I
- BA9105, Business Research: Econometrics I
- Stat8106, Generalized Linear Models I
- Stat8001, 8002, Probability Theory I, II

Undergraduate Course

- Stat3503/Stat8109, Intermediate Business Statistics
- Stat2103, Business Statistics
- Stat2512, Intermediate Statistics
- Stat2102, Selected Statistics Applications in Business

SERVICE CONTRIBUTION

Professional Service

- Chair of the membership committee, ICSA, 2022
- NSF review panel, March 2020
- Editorial board reviewers, *Journal of Machine Learning Research*, 2020 - present.
- Associate editor, *Statistical Analysis and Data Mining, 2013 - present.*
- Program committee of *ICSA* Applied Statistics Symposium 2018
- Program committee of *ICSA*-China Conference 2019
- Membership committee, *ICSA (International Chinese Statistical Association), 2015-2017*,
- Organizing committee of the conference on high dimensional statistics, 2013, Temple University
- Ad-hoc Review (* more than once): • scandinavian journal of statistics • Journal of the American Statistical Association(*) • Journal of Royal Statistical Society, Series B(*) • Biometrika • Annals of Statistics • Biometrics • The American Statistician(*) • Statistica Sinica(*) • Journal of Statistical Planning and Inference(*) • Journal of the Korean Statistical Society • Statistical Analysis and Data Mining • Journal of Probability and Statistics • Journal of Nonparametric Statistics • Journal of Statistical Modelling • Test • Journal of Biopharmmaceutical Research • Statistics and Probability Letters.

PRESENTATIONS

Presentations at Professional Conferences and Meetings

- **Invited.** BEAUTY powered BEAST. 63rd ISI World Statistics Congress 2021 (ISI WSC 2021). 2021
- **Invited Discussant.** Bayesian selective inference, International Seminar on Selective Inference. 2020
- **Invited.** Global testing under the sparse alternatives for single index models, CMStatistics Conference, Pisa, Italy, 2018
- **Invited.** Global testing under the sparse alternatives for single index models, The Second Annual Meeting of International Consortium of Chinese Mathematicians, Taipei, Taiwan, 2018

- **Invited.** Group Assisted Multiple Testing. ICSA Applied Statistics Symposium, New Jersey 2018
- **Invited.** Group Assisted Multiple Testing. Conference on Statistical Learning and Data Science. Chapel Hill, NC 2016
- **Invited.** Rate optimal multiple testing procedure in high-dimensional regression, IMS China International Conference on Statistics and Probability, Yunnan, China 2015
- **Invited.** Rate optimal multiple testing procedure in high-dimensional regression, ICSA China Statistics Conference, Shanghai, China 2015
- **Contributed.** Rate optimal multiple testing procedure in high-dimensional regression, Joint Statistical Meetings, Boston, MA 2014
- **Invited.** Rate optimal multiple testing procedure in high-dimensional regression, International Workshop on Multiplicity, Shanghai, China 2014
- **Invited.** Optimal Multiple Testing Procedure Under Linear Regression Model, ENAR Conference, Orlando, FL 2013
- **Contributed.** Optimal Multiple Testing Procedure Under Linear Regression Model, Joint Statistical Meetings, San Diego, CA 2012
- **Invited.** Capturing the Severity of Type II Errors in High-Dimensional Multiple Testing, ICSA Applied Statistics Symposiu, Boston, MA, 2012
- **Contributed.** On the Credible Interval under the zero-inflated Mixture Prior in High Dimension Inference, Joint Statistical Meetings, Miami, FL, 2011
- **Invited.** On the Generalized Benjamini-Hochberg procedure, IMS-China International Conference on Statistics and Probability, Xi'an, Shanxi, 2011
- **Invited.** On the Generalized Benjamini-Hochberg procedure, ICSA Applied Statistics Symposium, New York City, NY, 2011
- **Invited.** Empirical Bayes Confidence Intervals for Selected Parameters for a Large Number of Normal Populations with Unequal but Estimable Means and Variances, the Eighth ICSA International Conference, Guangzhou, Guangdong, 2010
- **Contributed.** Empirical Bayes Confidence Intervals for Selected Parameters for a Large Number of Normal Populations with Unequal but Estimable Means and Variances, Joint Statistical Meetings, Vancouver, Canada, 2010
- **Contributed.** Empirical Bayes FCR Controlling Confidence Interval, Joint Statistical Meetings, Washington DC, 2009
- **Invited.** Empirical Bayes Confidence Intervals Shrinking Both Means and Variances, the 17-th annual International Chinese Statistical Association Applied Statistics Symposium, Piscataway, NJ, 2008

Presentations at Departmental Colloquia

- Global testing under the sparse alternatives for single index models. George Mason University 2019
- Nonparametric Empirical Bayes Estimator For Simultaneous Variances, University of Connecticut, CT 2017
- A New Approach to Multiple Testing of Grouped Hypotheses, University of Illinois Urbana-Champaign, IL 2016
- A New Approach to Multiple Testing of Grouped Hypotheses, University of Delaware, DE 2015
- Testing Multiple Hypothesis in Big Data Analysis, Southwest Jiaotong University, Chengdou, China 2015
- Testing Multiple Hypothesis in Big Data Analysis, Beihang University, Beijing, China 2015
- Optimal Multiple Testing Methods, Auburn University, AL 2014
- Optimal Multiple Testing Procedure Under Linear Regression Model, Department of Statistics, University of Georgia, GA 2013
- Empirical Bayes Confidence Intervals for Selected Parameters in High dimension, National Institute of Environmental Health Sciences (NIEHS), Research Triangle Park, NC, 2011
- On the Credible Interval under the zero-inflated Mixture Prior in High Dimension Inference, Department of Mathematics, New Jersey Institute of Technology, Newark, NJ, 2011
- Empirical Bayes Confidence Intervals for Selected Parameters for a Large Number of Normal Populations with Unequal but Estimable Means and Variances, Department of Operations Research and Financial Engineering, Princeton University, Princeton, NJ, 2011
- Empirical Bayes Confidence Intervals for Selected Parameters with Unknown and Unequal Variances, Department of Statistics, University of Missouri, Columbia, MO, 2010
- Empirical Bayes Confidence Intervals for Selected Parameters with Unknown and Unequal Variances, Department of Statistics, Nankai University, Tianjin, China, 2010
- Empirical Bayes Confidence Intervals Shrinking Both Means and Variances, Department of Statistics, Temple University, Philadelphia, PA, 2009
- Empirical Bayes Confidence Intervals Shrinking Both Means and Variances, Department of Mathematics, Syracuse University, Syracuse, NY, 2008

HONORS & AWARDS

- Dean's Research Honor Roll, Fox School of Business Management, Temple University, 2014
- High Achievements in Sponsored Projects, Fox School of Business Management, Temple Univeristy, 2014, 2015, 2016
- Raghavarao Publication Award, Temple University, 2014

- Liu Memorial Award, awarded by Cornell University, 2009
- Laha Travel Award, awarded by the Institute of Mathematics Statistics, 2009,
- Batting Award, awarded by the Department of Mathematics, Cornell University, 2008
- Graduate School Travel Award and Fellowship awarded by Cornell University, 2008