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Education

PhD, Statistics, 05/98, University of Texas at Dallas, (GPA 4.0/4.0)

MS, Computer Science, 12/97, University of Texas at Dallas, (GPA 4.0/4.0)

MS, Statistics, 12/95, University of Texas at Dallas, (GPA 4.0/4.0)

MS, Applied Mathematics, 05/95, University of Texas at Dallas, (GPA 4.0/4.0)

MS, Computational Mathematics, 05/90, Lanzhou University, Lanzhou, P.R.China

Diploma in Mathematics, 06/83, Zhenjiang teachers' college (now part of Jiangsu University), Zhenjiang, Jiangsu, P.R. China

Experience

Full Professor, Department of Statistics and Probability, Michigan State University, 07/06-present

Associate Professor, Department of Statistics and Probability, Michigan State University, 07/03-06/06

Assistant Professor, Department of Statistics and Probability, Michigan State University, 06/02-06/03

Assistant Professor, Department of Mathematics and Statistics, Arizona State University, 08/98-08/02

Teaching Assistant, Department of Mathematics, University of Texas at Dallas, 09/93-05/98

Co-op, System Engineering, Northern Telecom (Nortel), Richardson, Texas, 05/96-08/96

Lecturer, Department of Mathematics, Central South University, P. R. China, 08/90-08/93

Grants and Awards Received

DMS-05-01174, supplemental grant to DMS-02-34078 (**CAREER**: “Statistical Depth Functions and their Applications”), NSF, Sole Investigator, \$20,000, 06/05-05/08.

DMS-02-34078, Faculty Early Career Development (**CAREER**) Program, NSF, “Statistical depth functions and their applications”, Sole Investigator, \$300,000, 06/02-05/07.

DMS-00-71976, NSF, “Finite sample performance of multivariate location and scatter estimators”, Sole Investigator, \$82,708, 06/00-05/03.

Start-up Grant, Michigan State University, \$55,000.00, 06/02-08/07.

Matching Funds, Michigan State University, \$82,000.00, 06/03-06/07.

RIA (Research Incentive Award), Arizona State Univ., \$9,222, 01/00-09/01.

FGIA (Faculty Grant In Aid), Arizona State Univ., “Multivariate data ordering based on statistical depth function”, Sole Investigator, \$5,000, 01/99-12/99.

CIR (Investigator Incentive Award), Arizona State Univ., \$2,908, 05/00-08/02.

Travel Grants, NSF, for conferences in Chicago, Baltimore, Dallas, Czech Republic, and Argentina

Peer-Refereed Papers

1. Zuo, Y. and Zuo, H. (2023), “Least sum of squares of trimmed residuals regression”, *Electronic Journal of Statistics*, Vol. 17, No. 2, 2416-2446. [**sixteen** pieces of associated R code are published on <https://github.com/left-github-4-codes/LST>]
2. Zuo, Y. (2023), “Non-asymptotic robustness analysis of regression depth median”, *Journal of Multivariate Analysis*, (in press).
3. Zuo, Y. (2022), “Non-asymptotic analysis and inference for an outlyingness induced winsorized mean”, arXiv:2105.02337, *Statistical Papers*, <https://doi.org/10.1007/s00362-022-01353-5>

4. Shao, W., Zuo, Y., Luo, J. (2022), “Employing the MCMC Technique to Compute the Projection Depth in High Dimensions”, *Journal of Computational and Applied Mathematics*, vol.(411), 114278
<https://doi.org/10.1016/j.cam.2022.114278>
5. Zuo, Y. (2021), “Computation of projection regression depth and its induced median”, *Computational statistics and data analysis*, Vol. 158, June 2021, 107184. <https://doi.org/10.1016/j.csda.2021.107184>
[some thirty-plus instances of (Matlab, R, and Rcpp) code associated with the article are available at <https://github.com/zuo-github/comp-prd-medians>] arXiv:1905.11846.
6. Zuo, Y. (2021), “On general notions of depth for regression” *Statistical Science* 2021, Vol. 36, No. 1, 142–157, arXiv:1805.02046.
7. Zuo, Y. (2021). “Robustness of the deepest projection regression depth functional”, *Statistical Papers*, vol. 62(3), pages 1167–1193.
8. Zuo, Y. (2020), “Depth induced regression medians and uniqueness”, *Stats* 2020, 3(2), 94–106, arXiv:1906.10461.
9. Zuo, Y. (2020), “Large sample properties of the regression depth induced median”, *Statistics and Probability Letters*, November 2020 166, arXiv:1809.09896.
10. Shao, W., and Zuo, Y. (2020). “Computing the halfspace depth with multiple try algorithm and simulated annealing algorithm”, *Computational Statistics*, vol. 35(1), pages 203–226.
11. Zuo, Y. (2018). “A new approach for the computation of halfspace depth in high dimensions”, *Communications in Statistics - Simulation and Computation*, 48(3): 900–921.
12. Liu, X., Luo S., and Zuo, Y. (2018). “The limit of finite sample breakdown point of Tukey’s halfspace median for general data”, *Acta Mathematica Sinica*, 34(9): 1403–1416.
13. Liu, X., Zuo, Y., and Wang, Q. (2017). “Finite sample breakdown point of Tukey’s halfspace median”, *Science in China Series A: Mathematics*, 60: 861–874.
14. Liu, X., Luo, S., and Zuo, Y. (2017). “Some results on the computing of Tukey’s halfspace median”, *Statistical Papers*, DOI 10.1007/s00362-017-0941-5.
15. Zuo, Y. (2016). “On the performance of confidence intervals on quantiles”, *Journal of Advanced Statistics*, 1(3), 171–179.
16. Zuo, Y. (2015). “Bahadur representations for bootstrap quantiles”, *Metrika*, 78(5), 597–610.

17. Liu, X. and Zuo, Y. (2015). "CompPD: A MATLAB package for computing projection depth", *Journal of Statistical Software*, 65(2), 1-21.
18. Liu, X. and Zuo, Y. (2014). "Computing halfspace depth and regression depth" *Communications in Statistics - Simulation and Computation*, 43(5), 969-985.
19. Liu, X. and Zuo, Y. (2014). "Computing projection depth and its associated estimators", *Statistics and Computing*, 24 (1), 51-63.
20. Zuo, Y. (2013). "Multidimensional medians and uniqueness", *Computational Statistics and Data Analysis*, 66, 82-88.
21. Liu, X., Zuo, Y. and Wang, Z. (2013). "Exactly computing bivariate projection depth contours and median", *Computational Statistics and Data Analysis*, 60, 1-11.
22. Shao, W. and Zuo, Y. (2012). "Simulated annealing for higher dimensional projection depth", *Computational Statistics and Data Analysis* 56, 4026-4036.
23. Luo, J. and Zuo, Y. (2011). "A new test for large dimensional regression coefficients", *Open Journal of Statistics*. 1(3), 212-216.
24. Luo, J. and Zuo, Y. (2011). "Statistical methods for differential gene detection in microarray", *Advances and Applications in Statistical Sciences*. 6(2), 77-88.
25. Jiang, B., Zhang, X., Zuo, Y., Kang, G. (2011). "A powerful truncated tail strength method for testing multiple null hypotheses in one dataset", *Journal of Theoretical Biology*, 277 (1), 67-73.
26. Zuo, Y. and Lai, S. (2011). "Exact computation of the bivariate projection depth and Stahel-Donoho estimator", *Computational Statistics and Data Analysis*, 55(3), 1173-1179.
27. Zuo, Y. (2010). "Is the t confidence interval: $\bar{x} \pm t_{\alpha}(n-1) \frac{s}{\sqrt{n}}$ optimal?", *The American Statistician*, 64(2), 170-173.
28. Serfling, R. and Zuo, Y. (2010). "Some Perspectives on Multivariate Quantile and Depth Functions"(discussion paper), *The Annals of Statistics*, 38(2), 676-684.
29. Zuo, Y. and Kang, G. (2010). "A mixed two-stage analysis for detecting interactions in genomewide association studies", *Journal of theoretical Biology*, 262(4), 576-583.
30. Yuan, Y., Wu, J., Zuo, Y. and Chen, J. (2009). "A new method for fitting the complicated water level process of the lower Yellow River", *Science in China Series E: Technological Sciences*, 52(10): 2997-3003.

31. Zuo, Y. (2009). "Data depth trimming counterpart of the classical t (or T^2) procedure", *Journal of Probability and Statistics*, Article ID 373572, 9 pages, doi:10.1155/2009/373572.
32. Zuo, Y. and Lai, S. (2009). "On a robust and efficient maximum depth estimator", *Science in China Series A: Mathematics*, 52(6), 1-21.
33. Wu, M. and Zuo, Y. (2009). "Trimmed and Winsorized means based on a scaled deviation", *Journal of Statistical Planning and Inference*. 139(2), 350-365.
34. Wu, M. and Zuo, Y. (2008). "Trimmed and Winsorized Standard Deviations based on a scaled deviation", *Journal of Nonparametric Statistics*, 20(4), 319-335.
35. Kang, G., Yue, W., Zhang, J., Huebner, M., Zhang, H., Ruan, Y., Lu, T., Ling, Y., Zuo, Y., Zhang, D (2008). "Two-stage designs to identify the effects of SNP combinations on complex diseases", *Journal of Human Genetics*, 53(8), 739-46.
36. Zuo, Y., Zou, G., Wang, J., Zhao, H., Liang, H. (2008). "Optimal two-stage design for case-control association analysis incorporating genotyping error", *The Annals of Human Genetics*, 72(3), 375-387.
37. Kang, G., Yue, W. Zhang, J., Cui, Y., Zuo, Y., and Zhang, D. (2008). "An entropy-based approach for modeling and testing genetic epistasis underlying complex diseases", *Journal of theoretical Biology*, 250(2), 362-374.
38. Kang, G., Zuo, Y. (2007). "Entropy-based joint analysis for two-stage genome-wide association studies", *Journal of Human Genetics*, 52(9), 747-756.
39. Zuo, Y. and He, X. (2006). "On the limiting distributions of multivariate depth-based rank sum statistics and related tests", *The Annals of Statistics*, 34(6), 2879-2896.
40. Zuo, Y. (2006). "Multi-dimensional trimming based on projection depth". *The Annals of Statistics*, 34(5), 2211-2251.
41. Zuo, Y. and Du, J. (2006). "On an L-estimator with data-dependent coefficients", *International Journal of Statistics and Management Systems*, 1(1), 24-47.
42. Zuo, Y. (2006). "Robust location and scatter estimators in multivariate analysis" (invited book chapter to honor Peter Bickel on his 65th Birthday), *The Frontiers in Statistics*, Imperial College Press (23 pages)

43. Zuo, Y., Zou, G. and Zhao, H. (2006). "Two-stage designs in case-control association analysis", *Genetics*, 173, 1747-1760.
44. Sha, Q., Zhu, X., Zuo, Y., Cooper, R. and Zhang, S. (2006). "A combinatorial searching method for detecting a set of interacting loci associated with complex traits", *The Annals of Human Genetics*, 70(5), 677-692.
45. Zou, G. and Zuo, Y. (2006). "On the sample size requirement in genetic association tests when the proportion of false positives is controlled", *Genetics*, 172(1), 1-5.
46. Arcones, M., Cui, H. and Zuo, Y. (2006). "Empirical depth processes", *Test* (Spanish statistical and operations research society), 15(1), 151-177.
47. Zuo, Y. and Cui, H. (2005). "Depth weighted scatter estimators", *The Annals of Statistics*, 33(1): 381-413.
48. Zuo, Y. (2004). "Projection based affine equivariant multivariate location estimators with the best possible finite sample breakdown point", *Statistica Sinica*, 14(4): 1199-1208.
49. Zuo, Y. (2004). "Robustness of weighted L_p - depth and L_p - median", *Allgemeines Statistisches Archiv* (Journal of the German Statistical Society), 88(1): 1-20.
50. Zuo, Y., Cui, H. and Young, D. (2004). "Influence function and maximum bias of projection depth based estimators", *The Annals of Statistics*, 32(1): 189-218.
51. Zuo, Y., Cui, H. and He, X. (2004). "On the Stahel-Donoho estimator and depth-weighted means of multivariate data", *The Annals of Statistics*, 32(1): 167-188.
52. Zuo, Y. (2004). "Statistical depth functions and some applications", *Advances in Mathematics* (China), 33(1), 1-26.
53. Zuo, Y. (2003). "Projection based depth functions and associated medians", *The Annals of Statistics*, 31(5), 1460-1490.
54. Zuo, Y. (2003). "Finite sample tail behavior of multivariate location estimators", *Journal of Multivariate Analysis*, 85, 91-105.
55. Zuo, Y. (2002). "Multivariate trimmed means based on data depth", *Statistical Data Analysis Based on the L_1 -Norm and Related Methods* (Y. Dodge ed.). Birkhäuser, 313-322.
56. Zuo, Y. (2001). "Finite sample tail behavior of Hodges-Lehmann type estimators", *Statistics*, 35, 557-568.

57. Zuo, Y. (2001). "Some quantitative relationships between two types of finite sample breakdown point", *Statistics and Probability Letters*, 51 (4), 369-375.
58. Zuo, Y. (2000). "Multivariate monotone location estimators", *Sankhyā, Series A*, 62 (2), 161-177.
59. Zuo, Y. and Serfling, R. (2000). "General notions of statistical depth function", *The Annals of Statistics*, 28 (2), 461-482.
60. Zuo, Y. and Serfling, R. (2000). "Structural properties and convergence results for contours of sample statistical depth functions", *The Annals of Statistics*, 28 (2), 483-499.
61. Zuo, Y. (2000). "A note on finite sample breakdown points of projection based multivariate location and scatter statistics", *Metrika*, 51 (3), 259-265.
62. Zuo, Y. and Serfling, R. (2000). "Nonparametric multivariate notions of 'scatter' and 'more scattered' based on statistical depth function", *Journal of Multivariate Analysis*, 75, 62-78.
63. Zuo, Y. and Serfling, R. (2000). "On the performance of some robust non-parametric location measures relative to a general notion of multivariate symmetry", *Journal of Statistical Planning and Inference*, 84, 55-79.
64. Zuo, Y. (2000). "Finite sample tail behavior of multivariate trimmed mean based on Tukey-Donoho halfspace depth", *Metrika*, 52 (1), 69-75.
65. Zuo, Y. and Zhang, J. (1995). "The existence and uniqueness of solutions for the equations in Runge-Kutta methods", *International Journal of Computer Mathematics*, 55, 67-77.
66. Zuo, Y. and Zhang, J. (1994). "The existence and uniqueness of solutions for the equations in Runge-Kutta methods", *International Journal of Computer Mathematics*, 50, 23-33.
67. Zuo, Y. and Zhang, J. (1991). "On the solvability of the Runge-Kutta equations", *Sichuan Shifan Daxue Xuebao Ziran Kexue Ban* (Chinese), 14 (4), 1-6.
68. Zuo, Y. and Zhang, J. (1991). "Nonlinear stability for a class of two-stage Runge-Kutta methods", *Sichuan Shifan Daxue Xuebao Ziran Kexue Ban* (Chinese), 14 (3), 56-60.
69. Zuo, Y. and Zhang, J. (1991). "B-convergence of the two-stage diagonally implicit R-K methods", *Sichuan Shifan Daxue Xuebao Ziran Kexue Ban* (Chinese), 14 (2), 14-22.

70. Zuo, Y. and Zhang, J. (1990). “B-convergence of a class of linear multistep methods”, *Sichuan Shifan Daxue Xuebao Ziran Kexue Ban* (Chinese), 13 (2), 7-11.
71. Zuo, Y. and Zhang, J. (1989). “The improvement of Taylor algorithm”, *Sichuan Shifan Daxue Xuebao Ziran Kexue Ban* (Chinese), 12 (2), 7-14.

Submitted Papers

- 04 Zuo, Y. (2022), “Asymptotics for the least trimmed squares estimator”, (under review).
- 03 Zuo, Y. (2023), “Robust penalized least squares of depth trimmed residuals regression for high-dimensional data”, (under review)

Technical Report(s)

- 02 Zuo, Y. (2022), “New algorithms for computing the least trimmed squares estimator”. arXiv4220133

[**eight** associated pieces of R code are published on <https://github.com/left-github-4-codes/comp-lts>]
- 01 Zuo, Y. (2022). “Asymptotic normality of the least sum of squares of trimmed residuals estimator”. arXiv4243064

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