CURRICULUM VITAE

CUN-HUI ZHANG

Address: Department of Statistics, Hill Center, Busch Campus
Rutgers University Piscataway NJ 08854, U.S.A.
Telephone: 848-445-7685 (Office); 732-445-3428 (Fax)
Email: czhang@stat.rutgers.edu

Education:

Ph.D. in Statistics, October 1984
M.A. in Statistics, January 1982
Columbia University, New York NY 10027

B.A. in Geology, August 1978
Huainan Mining Institute, Huainan, Anhui Province, China

Employment:

Distinguished Professor, 2000 to present
FSRM and MSDS Programs Co-Director, 2020-present
Graduate Program Director, 2000-2005
Professor, 1994-2000
Associate Professor, 1989-1994
Assistant Professor, 1987-1989
Dept. of Statistics, Hill Center, Busch Campus
Rutgers University, Piscataway NJ 08854

Assistant Professor, 1984-1987
State University of New York at Stony Brook
Dept. of Applied Mathematics and Statistics, Stony Brook NY 11794

Visiting Positions:

University of Pennsylvania, Educational Testing Service, Mathematical Sciences Research Institute at Berkeley CA, Columbia University, Hong Kong University of Science and Technology, ETH Zürich, Fudan University

Awards and Honors:

Fellow, The Institute of Mathematical Statistics

Fellow, American Statistical Association

Invited Lecture, International Congress of Mathematicians, 2022

ICSA Distinguished Achievement Award, 2021

ICCM Best Paper Award, 2019

ICCM Distinguished Paper Award, 2018

IMS Medallion Lecture, 2004

Presidential Young Investigator Award, 1988-1993

Henry Rutgers Research Fellowship, 1987-1989

Professional Activities:

Editor, *Statistical Science*, 2017-2019

Associate Editor, *Annals of Statistics*, 1993-1994, 2010-present

Associate Editor, *Statistical Science*, 2020-2022

Associate Editor, *Bernoulli*, 2015-2021

Associate Editor, *Statistics Surveys*, 2007-present

Associate Editor, *Statistica Sinica*, 1993-2002, 2006-2020

Council, Institute of Mathematical Statistics, 2016-2019

Board of Directors, International Chinese Statistical Association, 1998-2000

Recent Research Grants:

NSF DMS-15-13378 (2015-2018), C.-H. Zhang (PI), $300,000, "Semiparametric inference with high-dimensional data"

NSF IIS-1250985 (2016-2017), C.-H. Zhang (PI), $738,971, "BIGDATA: Statistical Machine Learning Methods for Scalable Data Analysis"

NSF IIS-1407939 (2016-2018), C.-H. Zhang (PI), $499,955, "Collaborative Research: Next-generation statistical optimization methods for Big Data Computing"

NSF DMS-1721495 (2017-2021), C.-H. Zhang (PI), $260,000, "Collaborative Research: Statistical Methods, Algorithms, and Theory for Large Tensors"

NSF IIS-1741390 (2017-2022), R. Chen (PI), D.Yang, C.-H. Zhang (Co-PIs), $1,000,000, "BIGDATA:F: Statistical Learning with Large Dynamic Tensor Data"

NSF CCF-1934924 (2019-2022), Fred S. Roberts (PI), Cun-Hui Zhang, Kostas Bekris, Matthew D. Stone, Konstantin M. Mischaikow (Co-PIs), $1,499,999, "HDR TRIPODS: Data Science Principles of the Human-Machine Convergence"

NSF DMS-2052949 (2021-2024), Cun-Hui Zhang (PI), Rong Chen, Han Xiao (Co-PIs), $600,000, "FRG: Collaborative Research: Dynamic Tensors: Statistical Methods, Theory, and Applications"

NSF DMS-2210850 (2022-2025), Cun-Hui Zhang (PI), $289,999, "Estimation and Inference with High-Dimensional Data"

Publications:

Zhang, C.-H. (1986). The lower limit of a normalized random walk. *Ann. Probab.* **14** 560-581.

Chow, Y. S. and Zhang, C.-H. (1986). A note on Feller's strong law of large numbers. *Ann. Probab.* **14** 1088-1094.

Robbins, H. and Zhang, C.-H. (1986). Maximum likelihood estimation in regression with uniform errors. In *Adaptive Statistical Procedures and Related Topics*, J. Van Ryzen, Ed., Institute of Mathematical Statistics, Lecture Notes-Monograph Series, Vol. **8** 365-385.

Zhang, C.-H. (1988). A nonlinear renewal theory. *Ann. Probab.* **16** 793-824.

Robbins, H. and Zhang, C.-H. (1988). Estimating a treatment effect under biased sampling. *Proc. Nat. Acad. Sci. USA* **85** 3670-3672.

Zhang, C.-H. (1989). A renewal theory with varying drift. *Ann. Probab.* **17** 723-736.

Robbins, H. and Zhang, C.-H. (1989). Estimating the superiority of a drug to a placebo when all and only those patients at risk are treated with the drug. *Proc. Nat. Acad. Sci. USA* **86** 3003-3005.

Zhang, C.-H. (1990). Fourier methods for estimating mixing densities and distributions. *Ann. Statist.* **18** 806-831.

Robbins, H. and Zhang, C.-H. (1991). Estimating a multiplicative treatment effect under biased allocation. *Biometrika* **78** 349-354.

Li, Z. and Zhang, C.-H. (1992). Asymptotically efficient allocation rules for two Bernoulli populations. *J. Roy. Statist. Soc. B* **54** 609-616.

Vardi, Y. and Zhang, C.-H. (1992). Large sample study of empirical distributions in a random-multiplicative censoring model. *Ann. Statist.* **20** 1022-1039.

Gu, M. G. and Zhang, C.-H. (1993). Asymptotic properties of self-consistent estimators based on doubly censored data. *Ann. Statist.* **21** 611-624.

Maguluri, G. and Zhang, C.-H. (1994). Estimation in the mean residual life regression model. *J. Roy. Statist. Soc. B* **56** 477-489.

Huang, Y. and Zhang, C.-H. (1994). Estimating a monotone density from censored observations. *Ann. Statist.* **22** 1256-1274.

Klass, M. J. and Zhang, C.-H. (1994). On the almost sure minimal growth rate of partial sum maxima. *Ann. Probab.* **22** 1857-1878.

Zhang, C.-H. (1995). On estimating mixing densities in discrete exponential family models. *Ann. Statist.* **23** 929-945.

Tsai, W.-Y. and Zhang, C.-H. (1995). Asymptotic properties of nonparametric maximum likelihood estimator for interval-truncated data. *Scand. J. Statist.* **22** 361-370.

Loh, W.-L. and Zhang, C.-H. (1996). Global properties of kernel estimators for mixing densities in exponential family models for discrete variables. *Statistica Sinica* **6** 561-578.

Teicher, H. and Zhang, C.-H. (1996). A decomposition for some U-type statistics. *J. Theor. Probab.* **9** 161-170.

Giné, E. and Zhang, C.-H. (1996). On integrability in the LIL for degenerate U-statistics. *J. Theor. Probab.* **9** 385-412.

Zhang, C.-H. (1996). Strong law of large numbers for sums of products. *Ann. Probab.* **24** 1589-1615.

Zhang, C.-H. and Li, X. (1996). Linear regression with doubly censored data. *Ann. Statist.* **24** 2720-2743.

Behr, T.M. Sharky, R.M., Juweid, M.E., Dunn, R.M., Ying, Z., Zhang, C.-H., Siegel, J.A., Gold, D.V. and Goldenberg, D.M. (1996). Factors influencing the pharmacokinetics, dosimetry, and diagnostic accuracy of radioimmunodetection and radioimmunotherapy of CEA-expressing tumors. *Cancer Res.* **56** 1805-1816.

Zhang, C.-H. (1997). Empirical Bayes and compound estimation of normal means. *Statistica Sinica* **7** 181-194.

Loh, W.-L. and Zhang, C.-H. (1997). Estimating mixing densities in exponential family models for discrete variables. *Scand. J. Statist.* **24** 15-32.

Behr, T.M., Sharky, R.M., Juweid, M.E., Dunn, R.M., Vagg, R., Ying, Z., Zhang, C.-H., Swayne, L.C., Vardi, Y., Siegel, J.A. and Goldenberg, D.M. (1997). Phase I/II clinical cancer radioimmunotherapy with a ^{131}I-labelled anti-CEA murine IgG monoclonal antibody. *J. Nucl. Med.* **38** 858-870.

Chen, T.T. and Zhang, C.-H. (1997). An invariant selection rule for multiple-treatment trials with linear prior preference. *Statistica Sinica.* **7** 595-606.

Bai, Z., Cheng, P.E. and Zhang, C.-H. (1997). An extension of the Hardy-Littlewood strong law. *Statistica Sinica* **7** 923-928.

Juweid, M.E., Zhang, C.-H., Blumenthal, R.D., Sharky, R.M., Dunn, R.M., Dunlop, D. and Goldenberg, D.M. (1997). Factors influencing hematologic toxicity of radioimmunotherapy with ^{131}I-labelled anti-carcinoembryonic antigen antibodies. *Cancer Suppl.* **80** 2749-2753.

Brown, L. D. and Zhang, C.-H. (1998). Asymptotic nonequivalence of nonparametric experiments when the smoothness index is 1/2. *Ann. Statist.* **26** 279-287.

Teicher, H. and Zhang, C.-H. (1998). Moments of some stopping rules. *J. London Math. Soc.* **57** 503-512.

Li, G. and Zhang, C.-H. (1998). Linear regression with interval censored data. *Ann. Statist.* **26** 1306-1327.

Zhang, C.-H. (1999). Unbiased estimation of a lattice mixing distribution and the characteristic function of a general mixing distribution. *Sankhyā A* **61** 101-112.

Zhang, C.-H. (1999). Sub-Bernoulli functions, moment inequalities and strong laws for positive and symmetrized U-statistics. *Ann. Probab.* **27** 432-453.

Vardi, Y. and Zhang, C.-H. (1999). Reconstruction of binary images from limited projections via the EM algorithm. In *Discrete Tomography: Foundations, Algorithms and Applications*, G.T. Herman and A. Kuba Eds., Birkhäuser, Boston, pp. 297-316.

Stein, R., Juweid, M.E., Zhang, C.-H. and Goldenberg, D.M. (1999). Assessment of combined radioimmunotherapy and chemotherapy for treatment of medullary thyroid cancer. *Clinical Cancer Research Suppl.* **5** 3199-3206.

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^{131}I-labelled anticarcinoembryonic antigen monoclonal antibodies. *J. Nuclear Medicine* **40** 1609-1616.

Bárány, I., Rote, G., Steiger, W. and Zhang, C.-H. (2000). A central limit theorem for convex chains in the square. *Discrete and Computational Geometry* **23** 35-50.

Vardi, Y. and Zhang, C.-H. (2000). The multivariate L_1-median and associated data depth. *Proc. Nat. Acad. Sci. USA.* **97** 1423-1426. Tech. Rep. 99-006, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Fuh, C.-D. and Zhang, C.-H. (2000). Poisson equation, moment inequalities and quick convergence for Markov random walks. *Stoch. Proc. Appl.* **87** 53-67.

Shepp, L. and Zhang, C.-H. (2000). Fast functional magnetic resonance imaging via prolate wavelets. *Appl. Comput. Harmonic Analysis* **9** 99-119.

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Lindquist, M., Yang, Q. X., Zhang, C.-H., Demeure, R. J., Smith, M. B. and Shepp, L. (2000). ROI tailored k-space sampling and a 2D prolate spheroidal wave function filter: reduction of spectral contamination in spectroscopic imaging. In *Proceedings of the 8th ISMRM Annual Meeting*, Denver, 2000, 1842.

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Zhang, C.-H. (2001). Some moment and exponential inequalities for V-statistics with bounded kernels. *J. Theor. Probab.* **14** 511-525. Tech. Rep. 99-004, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Zhang, C.-H. (2001). Discussion on "Inference for semiparametric models: some questions and an answer" by P.J. Bickel and J. Kwon. *Statistica Sinica* **11** 941-945.

Shoung, J.-M. and Zhang, C.-H. (2001). Least squares estimators of the mode of a unimodal regression function. *Ann. Statist.* **29** 648-665. Tech. Rep. 99-005, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Vardi, Y., Ying, Z. and Zhang, C.-H. (2001). Two-sample tests for growth curves under dependent right censoring. *Biometrika* **88** 949-960. Tech. Rep. 99-009, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Zhang, C.-H. (2002). Risk bounds in isotonic regression. *Ann. Statist.* **30** 528-555. Tech. Rep. 99-003, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Brown, L. D. Cai, T. T., Low, M. G. and Zhang, C.-H. (2002). Asymptotic equivalence theory for nonparametric regression with random design. *Ann. Statist.* **30** 688-707. Coupling inequalities for some random design matrices and asymptotic equivalence of nonparametric regression and white noise. Tech. Rep. 96-020, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Tian, X., Vardi, Y. and Zhang, C.-H. (2002). L_1-depth, depth relative to a model, and robust regression. In *Statistical Data Analysis Based on the L_1-Norm and Related Methods*, Y. Dodge, Ed., Birkhäuser, Boston, pp. 285-299.

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Jörnsten, R., Vardi, Y. and Zhang, C.-H. (2002). On the bitplane compression of microarray images. In *Statistical Data Analysis Based on the L_1-Norm and Related Methods*, Y. Dodge, Ed., Birkhäuser, Boston, pp. 415-425.

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Yang, Q.X., Lindquist, M.A., Shepp, L., Zhang, C.-H., Wang, J. and Smith, M.B. (2002). Two dimensional prolate spheroidal wave functions for MRI. *J. Magnetic Resonance* **158** 43-51.

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Hajjar, G., Sharkey, R.M., Burton, J., Zhang, C.-H., Yeldell, D., Matthies, A., Alavi, A., Losman, M.J., Brenner, A., and Goldenberg, D. (2002). Phase I radioimmunotherapy trial with iodine-131–labelled humanized MN-14 anti-carcinoembryonic antigen monoclonal antibody in patients with metastatic gastrointestinal and colorectal cancer. *Clin. Colorectal Cancer* **2** 31-42.

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Melnik, O., Vardi, Y. and Zhang, C-H. (2003). Algorithms for combining classifiers with applications to face recognition. In *Proceedings of the Biometrics Consortium Conference (BCCC)*, September 22nd-24th, 2003 Washington D.C.

Melnik, O., Vardi, Y. and Zhang, C.-H. (2004). Mixed group ranks: preference and confidence in classifier combination. *IEEE Trans. Pattern Analysis and Machine Intelligence* **26** 973-981.

Brown, L. D. Carter, A.V., Low, M. G. and Zhang, C.-H. (2004). Asymptotic equivalence theory for a Poisson process with variable intensity. *Ann. Statist.* **32** 2074-2097.

Zhang, C.-H. (2005). General empirical Bayes wavelet methods and exactly adaptive minimax estimation. *Ann. Statist.* **33** 54-100. General empirical Bayes wavelet methods. Tech. Rep. 2000-007, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854.

Melnik, O., Vardi, Y. and Zhang, C.-H. (2005). A probability model for combining ranks. In *Multiple Classifier Systems: Proceedings of the Sixth International Workshop, MCS 2005*, N.C. Oza, R. Polikar, J. Kittler, et al. Eds., Springer-Verlag, Berlin Heidelberg, (Lecture Notes in Computer Science, Vol. **3541**) 64-73.

http://dx.doi.org/10.1007/11494683_7

Chen, R.W., Shepp, L.A., Yao, Y.-C. and Zhang, C.-H. (2005). On optimality of bold play for primitive casinos in the presence of inflation. *J. Appl. Probab.* **42** 121-137.

Huang, J. and Zhang, C.-H. (2005). Asymptotic analysis of a two-way semilinear model for microarray data. *Statistica Sinica* **15** 597-618.

Zhang, C.-H. (2005). Estimation of sums of random variables: examples and information bounds. *Ann. Statist.* **33** 2022-2041.

Huang, J. and Zhang, C.-H. (2005). Comment on "Semilinear high-dimensional model for normalization of microarray data: a theoretical analysis and partial consistency" by Fan, Peng and Huang. *J. Amer. Statist. Assoc.* **100** 800-804.

Huang, J., Wang, D. and Zhang, C.-H. (2005). A two-way semi-linear model for normalization and analysis of cDNA microarray data. *J. Amer. Statist. Assoc.* **100** 814-829.

Lindquist, M., Zhang, C.-H., Glover, G., Shepp, L. and Yang, Q. (2005). The generalized 2D-PSWF method for tracking dynamic signal with high temporal resolution. In *Proceedings of the 13th ISMRM Annual Meeting*, Miami, 2005, 2308.

Ying, Z. and Zhang, C.-H. (2006). A conversation with Yuan Shih Chow. *Statistical Science* **21** 99-112.

Huang, J. and Zhang, C.-H. (2006). A two-way semilinear model for normalization and analysis of microarray data. In *Springer Handbook of Engineering Statistics*, H. Pham Ed., Springer, New York, pp. 719-735.

Nagai, K. and Zhang, C.-H. (2006). Nonlinear renewal theorems for random walks with perturbations of intermediate order. In *Recent Developments in Nonparametric Inference and Probability: Festschrift for Michael Woodroofe*, R. Keener and J. Sun, Eds., Institute of Mathematical Statistics, Lecture Notes-Monograph Series **50** 164-175.

Zhang, C.-H. (2006). Upper limit of normalized random walks with infinite moments. In *Random Walks, Sequential Analysis and Related Topics*, C. A. Hsiung, Z. Ying and C.-H. Zhang, Eds., World Scientific, Singapore, pp. 157-168.

Hsiung, C.A., Ying, Z. and Zhang, C.-H. (2006). *Random Walks, Sequential Analysis and Related Topics*. World Scientific, Singapore.

Lindquist, M.A., Zhang, C.-H., Glover, G., Shepp, L. and Yang, Q.X. (2006). A generalization of the two dimensional prolate spheroidal wave function method for non-rectilinear MRI data acquisition methods. *IEEE Trans. Image Processing* **15** (9) 2792-2804.

Melnik, O., Vardi, Y. and Zhang, C.-H. (2007). Convex learners for RankBoost. *J. Machine Leaning Research* **8** 791-812.

Viger, F., Barrat, A., Dall'Asta, L., Zhang, C.-H. and Kolaczyk, E.D. (2007). What is the real size of a sampled network? The case of the Internet. *Physical Review E* **75** 056111 1-10.

Vardi, Y. and Zhang, C.-H. (2007). Measures of network vulnerability. *IEEE Signal Processing Letters* **14** 313-316.

Wang, D., Zhang, C.-H., Soares, M.B., and Huang, J. (2007). Systematic approachs for incorporating control spots and data quality information to improve normalization of cDNA microarray data. *J. Biopharmaceutical Statist.* **17** 415-431.

Tang, W. and Zhang, C.-H. (2007). Empirical Bayes methods for controlling the false discovery rate with dependent data. In *Complex Datasets and Inverse Problems: Tomography, Networks, and Beyond*, R. Liu, W. Strawderman and C.-H. Zhang, Eds., Institute of Mathematical Statistics, Lecture Notes-Monograph Series **54** 151-160.

Fang, J., Vardi, Y. and Zhang, C.-H. (2007). An iterative tomogravity algorithm for the estimation of network traffic. In *Complex Datasets and Inverse Problems: Tomography, Networks, and Beyond*, R. Liu, W. Strawderman and C.-H. Zhang, Eds., Institute of Mathematical Statistics, Lecture Notes-Monograph Series **54** 12-23.

Liu, R., Strawderman, W. and Zhang, C.-H. (2007). *Complex Datasets and Inverse Problems: Tomography, Networks, and Beyond*. Institute of Mathematical Statistics, Lecture Notes-Monograph Series.

Zhang, C.-H. (2007). Continuous generalized gradient descent. *J. Comp. Graph. Statist.* **16** 761-781. Tech. Rep. 2005-005, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854

Lindquist, M., Zhang, C.-H., Glover, G. and Shepp, L. (2008). Rapid three-dimensional functional magnetic resonance imaging of the initial negative BOLD response. *J. Magnetic Resonance* **191** 100-111.

Zhang, C.-H. (2008). Discussion: One-step sparse estimates in nonconcave penalized likelihood models. *Ann. Statist.* **36** 1553-1560.

Lindquist, M., Zhang, C.-H., Glover, G. and Shepp, L. (2008). Acquisition and Statistical Analysis of Rapid 3D fMRI data. *Statistica Sinica* **18** 1395-1419.

Zhang, C.-H. and Huang, J. (2008). The sparsity and bias of the LASSO selection in high-dimensional regression. *Ann. Statist.* **36** 1567-1594. Model-selection consistency of the LASSO in high-dimensional linear regression. Tech. Rep. 2006-003, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854

Huang, J., Ma, S. and Zhang, C.-H. (2008). Adaptive Lasso for sparse high-dimensional regression models. *Statistica Sinica* **18** 1603-1618.

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Jiang, W. and Zhang, C.-H. (2009). General maximum likelihood empirical Bayes estimation of normal means. *Ann. Statist.* **37** 1647-1684.

Zhang, C.-H. (2009). Generalized maximum likelihood estimation of normal mixture densities. *Statistica Sinica* **19** 1297-1318.

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Ye, F. and Zhang, C.-H. (2010). Rate minimaxity of the Lasso and Dantzig selector for the ℓ_q loss in ℓ_r balls. *J. Machine Leaning Research* **11** 3519-3540. Rate minimaxity of the Lasso and Dantzig estimators. Tech. Rep. 2009-001, Dept. Statistics, Rutgers University, Piscataway, New Jersey 08854

Fan, C., Zhang, D. and Zhang, C.-H. (2011). On sample size of the Kruskal-Wallis test with application to a mouse peritoneal cavity study. *Biometrics* **67** 213-224.

Li, P. and Zhang, C.-H. (2011). A new algorithm for compressed counting with applications in Shannon entropy estimation in dynamic data. *JMLR: Workshop and Conference Proceedings, COLT* **19** 477-496.

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