

Curriculum Vitae

Haiyan Wang

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Research Interests

Nonparametric methods, rank tests, longitudinal and functional data analysis, analysis of clustered data, analysis of high dimensional data, bioinformatics.

Education

- Ph.D. (Statistics), 2004, The Pennsylvania State University, State College, Pennsylvania USA
 - Dissertation: Testing In Multifactor Heteroscedastic ANOVA and Repeated Measures Designs with Large Number Of Levels
 - Major professor: Michael G. Akritas
- M.S. (July, 1999), B.S. (July 1996), Beijing University, Beijing, China

Academic Experience

- Associate Professor with tenure: Feb., 2010 - Current, Kansas State University, Manhattan, Kansas USA
- Assistant Professor: Aug., 2004 - Feb. 2010, Kansas State University, Manhattan, Kansas USA
- Graduate Teaching Assistant: Aug., 1999 - Dec. 2003, Pennsylvania State University
- Graduate Research Assistant: May - August, 2001, January - May 2004, Pennsylvania State University

Peer Reviewed Publications

1. Lieceng Zhu, Xuming Liu, **Haiyan Wang**, Chitvan Khajuria, John C. Reese, R. Jeff Whitworth, Ruth Welti, and Ming-Shun Chen (2012) Rapid Mobilization of Membrane Lipids in Wheat Leaf-Sheaths during Incompatible Interactions with Hessian Fly. To appear in *Molecular Plant-Microbe Interactions*.
2. Jin-Liang Li, Li-Feng Wang, **Haiyan Wang**, Lian-Yang Bai, Zheming Yuan (2012) High-Accuracy Splice Sites Prediction Based on Sequence Component and Position Features. Accepted by *Genetics and Molecular Research*.
3. Cui, L., Wang, Z., Jiang, H., **Wang, H.**, Su, X., and Cui, L. (2012) Lack of Association of the S769N Mutation in Plasmodium falciparum SERCA (PfATP6) with Resistance to Artemisinins. Accepted by *Antimicrobial Agents and Chemotherapy*. doi:10.1128/AAC.05943-11
4. Zhou, W., Dai, Z., Chen, Y., **Wang, H.**, Chen, M., Yuan, Z. (2012) High-dimensional descriptor selection and computational QSAR modeling for antitumor activity of ARC-111 analogues based on SVR. *International Journal of Molecular Sciences*, **13**, 1161-1172; doi:10.3390/ijms13011161
5. Santosh G. and **Wang H.** (2012). Classification of Image Pixels based on Minimum Distance and Hypothesis Testing. *Computational Statistics and Data Analysis*, **56**, 2273-2287.
6. Qian, G., **Wang, H.**, and Yuan, Z. (2011) Using homology information from PDB to improve the accuracy of protein β -turn prediction by NetTurnP. *Progress in Biochemistry and Biophysics*. http://www.pibb.ac.cn/cn/ch/common/create_pdf.aspx?file_no=20110370&flag=1
7. Zhang, K., **Wang, H.**, Bathke, A.C., Harrar, S., Piepho, H.P., Deng, Y.P. (2011). A nonparametric test to compare replicated longitudinal microarray data with application in IL-2 stimulation study. *BMC Bioinformatics*. **12**:273. **Highly Accessed**. <http://www.biomedcentral.com/1471-2105/12/273>

8. **Wang, H.**, Maldonado, D., and Silwal, S. (2011). A Nonparametric-Test-Based Structural Similarity Measure for Digital Images. *Computational Statistics and Data Analysis*. 55: 2925-2936. doi:10.1016/j.csda.2011.04.021
9. **Wang, H.** and Akritas, M. (2011), Asymptotically Distribution Free Tests in Heteroscedastic Unbalanced High Dimensional ANOVA. *Statistica Sinica*. Vol. **21**(3), 1341-1377.
10. **Wang, H.** and Akritas, M. (2010a), Rank test for heteroscedastic functional data. *Journal of Multivariate Analysis*. **101**: 1791-1805.
11. Zhang, K. and **Wang, H.** (2010), Nonparametric tests for longitudinal array comparative genomic hybridization data. *Statistics and Its Interface*. Vol **3**, No. 2, Pages 211-222.
12. Bathke, A.C., Harrar, S.W., **Wang, H.**, Zhang, K., and Piepho H. (2010), Series of Randomized Complete Block Experiments with Non-normal Data. *Computational Statistics and Data Analysis*. Vol. **54**, Issue 7, Pages 1840-1857.
13. **Wang, H.**, Tolos, S. and Wang, S. (2010), A Distribution Free Nonparametric Test to Detect Dependence Between a Response Variable and Covariate in Presence of Heteroscedastic Treatment Effects. *The Canadian Journal of Statistics*. Vol. **38**, No. 3, Pages 408-433.
14. Zhang, S., Shukle, R., Mittapalli, O., Zhu, Y.C., Reese, J.C., **Wang, H.**, Hua B., and Chen M. (2010). The gut transcriptome of a gall midge, *Mayetiola destructor*. *Journal of Insect Physiology*. Volume 56, Issue 9, September 2010, Pages 1198-1206.
15. Liu, X., Williams, C.E., Nemacheck, J.A., **Wang, H.**, Subramanyam, S., Zheng, C. and Chen, M. (2010), Reactive Oxygen Species Is Involved in Plant Defense against a Gall Midge. *Plant Physiology*. **152**: 985-999.
16. **Wang, H.**, Higgins, J., and Blasi, D. (2010). Distribution-Free Tests For No Effect Of Treatment In Heteroscedastic Functional Data Under Both Weak And Long Range Dependence. *Statistics and Probability Letters*. **80**: 390-402. Doi:10.1016/j.spl.2009.11.016
17. **Wang, H.** and Akritas, M. (2010b). Inference from heteroscedastic functional data, *Journal of Nonparametric Statistics*. **22**:2, 149-168. DOI: 10.1080/10485250903171621
18. Miao, J., Fan, Q., Cui, L., Li, X., **Wang, H.**, Ning, G., Reese, J.C., Cui, L. (2010) The MYST family histone acetyltransferase regulates gene expression and cell cycle in malaria parasite *Plasmodium falciparum*. *Molecular Microbiology* **78**(4): 883-902.
19. Song, W., **Wang, H.** and Yao, W. (2009). On the Adaptive Robust Modal Local Polynomial Regression, *International Journal of Statistical Sciences*. **9**: 217-231.
20. **Wang, H.** and Akritas, M. (2009b). Rank Tests in Heteroscedastic Multi-Way HANOVA, *Journal of Nonparametric Statistics*. **21**(6): 663-681.
21. von Borries, G. and **Wang, H.** (2009). Partition clustering of high dimensional low sample size data based on p-values, *Computational Statistics and Data Analysis*. **53**: 3987-3998.
22. Chen M.S., Echegaray E., Whitworth, R.J., **Wang H.**, Sloderbeck, P.E., Knutson, A., Giles K.L. and Royer T.A. (2009). Virulence analysis of Hessian fly (*Mayetiola destructor*) populations from Texas, Oklahoma, and Kansas, *Journal of Economic Entomology*. **102**(2): 774-780.
23. Chen, M.S., Liu X.M., **Wang H.**, and El Bouhssini M. (2009). Hessian fly (*Mayetiola destructor*) interactions with barley, rice, and wheat seedlings, *Journal of Economic Entomology*. **102**(4): 1663-1672.
24. **Wang, H.**, Neill, J.W. and Miller, F.R. (2008). Nonparametric Clustering of Functional Data, *Statistics and Its Interface*. **1**: 47-62.
25. **Wang, H.** (2006). Book review for "Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models Edited by Faraway J. J.", *Biometrics*. **62**(4): 1278.
26. **Wang, H.** and Akritas, M.G. (2004). Rank Tests for ANOVA with Large Number of Factor Levels, *Journal of Nonparametric Statistics*, **16**(3-4): 563-589.

27. Shi, P., **Wang, H** and Zheng, Z. (2001). Semiparametric model selection in large samples, *J. Syst. Sci. Complex.* **14**(4): 378-387.
28. Shi P., **Wang H.**, Zhang L. (2000). Asymptotic theory of nonparametric regression estimates with censored data, *Science In China.* **43**(6): 574-580.

Manuscripts under review/revision

29. Silwal, S. and **Wang, H.**, Maldonado, D.,(2010). Image similarity assessment via nonparametric hypothesis testing on wavelet coefficients. Submitted to CSDA.
30. Miao Miao, Hao Meng, Lanou Wu, Daniel Parker, Jia Li, Zhen Zhao, Zenglei Wang, Rongping Zhang, Qi Fan, **Haiyan Wang**, Liwang Cui and Zhaoqing Yang (2011) In Vitro Sensitivity of Plasmodium falciparum from China-Myanmar Border Area to Major ACT Drugs and Polymorphisms in Potential Target Genes. Submitted to PLoS ONE on Sep 4, 2011.
31. Zhang, Hongyan, **Wang, Haiyan**, Dai, Zhijun, Chen, Ming-shun, and Yuan, Zheming (2011) Improving Accuracy for Cancer Classification with a New Algorithm for Genes Selection.
32. Jin, L., Wang S., and **Wang, H.** A new nonparametric stationarity test of time series in time domain. Submitted to Biometrika around 3/23/12.

Manuscripts in progress

32. **Wang H.**, Zhang, K., Carroll R.J. and Suojin Wang (2011). Distribution-Free tests for unbalanced heteroscedastic longitudinal data in high dimensional ANOVA setting.
33. Tolos, S., **Wang, H.**, Wang, S. and Brown, S. (2011). A distribution-free test of no main nonparametric covariate effect and no treatment and covariate interaction.
34. Lee, G. and **Wang, H.** (2011) Hypothesis Testing in Correlated High Dimensional Matrix Data with Limited Replications.

Presentations and Invited Talks

- ❑ A Distribution-Free Test to Detect General Dependence and High Dimensional Variable Selection. Invited talk in special session of "Mathematical Statistics" at the 1081st AMS Meeting, March 30 - April 1, 2012.
- ❑ Nonparametric Variable Selection in High Dimensional Data for Classification. Invited seminar talk at Department of Statistics, Penn State University. Aug. 2011.
- ❑ Nonparametric tests and test-based genome partitioning for longitudinal DNA copy number data. Invited seminar talk at Department of Mathematics and Statistics, University of Missouri at Kansas City. Oct. 2010.
- ❑ K-nearest neighbor based distribution-free tests to identify relationship between variables in presence of potentially a large number of categorical factors. Invited seminar talk at Department of Statistics, University of Missouri. Sep. 2010.
- ❑ A new image similarity index based on nonparametric hypothesis testing. Invited talk at the International Conference on Statistical Analysis of Complex Data. July 2010.
- ❑ A nonparametric test of nonlinear covariate effects and their interactions with categorical factors. Invited seminar talk at Department of Statistics, Shanghai Fiance and Economics University. July 2010.
- ❑ A Nonparametric Test of Independence and Its Application in Digital Image Quality Assessment, Invited Project PACE speaker for Colloquium at Department of Mathematical Sciences, University of Montana (PACE represents Partnership for Comprehensive Equity with the goal to increase the representation and advancement of women in academic science and engineering careers). May 2-6, 2010.
- ❑ Nonparametric test for longitudinal data in nonclassical setting, Invited young researcher talk at UGA symposium "New Directions in Asymptotic Statistics", May 15-16, 2009.
- ❑ Nonparametric Tests For Longitudinal Array Comparative Genomic Hybridization Data, poster at Statistical Methods for Complex Data, College Station, TX, March 2009.
- ❑ A nonparametric test of independence between response and covariates adjusted for treatment effects, invited talk at Workshop on "Nonparametric Statistics, Refined, Redefined, and Renewed", Arlington TX, April 2009.

- ❑ Computational Methods to Characterize Regulatory Networks involved in Plant Response to Abiotic Stresses, Poster presentation at Genes in Ecology, Ecology in Genes Symposium at Kansas City, Nov. 2008.
- ❑ Nonparametric Mixture Model Based Clustering of Discrete Functional Data, Topic contributed talk on Joint Statistical Meetings, Aug. 2008.
- ❑ Invited talk at Classification Society of North America in Saint Louis, June 2008.
- ❑ Invited talk at Nonparametrics and mixture models conference in Penn State, May 2008.
- ❑ Invited talk at the Kansas Ecological Genomics Research forum, May 2008.
- ❑ Inference on nonparametric hypothesis testing in high dimensional data, International Conference on High Dimensional Data Analysis, August, 2007, Kuming, China, invited.
- ❑ Clustering time course gene expression data using nonparametric hypothesis testing, Joint Statistical Meetings 2007, topic-contributed.
- ❑ Inference on nonparametric hypothesis testing and its application in microarray and mass spectrometric data, IMS 10th Meeting of New Researchers in Statistics and Probability, 2007.
- ❑ A divisive method via multivariate hypothesis testing for clustering gene expression patterns, Joint Statistical Meetings 2006, contributed.
- ❑ Chair for Session: QTL Analysis and Mapping, Joint Statistical Meetings, 2006.
- ❑ "Analysis of Microarray Gene Expression Data with Nonparametric Hypothesis Testing", Department of Statistics seminar at University of Florida, Mar 21, 2006, invited.
- ❑ Nonparametric Hypothesis Testing in Functional Data, Joint Statistical Meetings, 2005, topic contributed.
- ❑ Clustering curves based on hypothesis testing, 8th New Researchers' Conference, 2005, poster.
- ❑ Clustering Genes for Time Course Microarray Data, Graybill Conference, 2005, poster.
- ❑ "Testing in multi-factor heteroscedastic ANOVA and repeated measures designs with large number of levels", at seminars between January 2004 and March 2004 in Oklahoma State University; Kansas State University; Utah State University; Portland State University; Texas A & M University; University of Toronto. All invited.
- ❑ Analysis of Heteroscedastic Multifactor Designs with Large Number of Factor Levels, ENAR 2004, contributed.
- ❑ Rank tests for Heteroscedastic Mixed-Effects Model when the Number of Repeated Measurements is Large, Joint Statistical Meetings, 2003, contributed.
- ❑ Inference of Mixed-Effects Model based on original observations when the Number of Repeated Measurements is large, International Conference on Current Advances and Trends in Nonparametric Statistics, July 2002, invited.
- ❑ Semiparametric Model Selection in Large Samples, Sixth Chinese National Conference on Probability and Statistics, 1999, contributed.

Workshops Attended

- ❑ NISS/ASA Writing Workshop for Junior Researcher
- ❑ Workshop on Frontiers of Statistics, 2006, Princeton University.
- ❑ Seventh Annual Winter Workshop on longitudinal data analysis, 2005, UFL.
- ❑ American Statistical Association (ASA) Workshop on "Nonparametric Statistics: Frontier", 2005, Texas.

Honors, Awards and Funding

- ❑ President's Faculty Development Award, \$2500, May 2010.
- ❑ Principal Investigator, Ecological Genomics Seed Grant, \$35,589 for June 2008 - May, 2009, "Computational methods to characterize regulatory networks involved in plant response to abiotic stresses". Nine month support for a GRA in Statistics. Funded by Kansas State University Ecological Genomics Institute.
- ❑ Big 12 Faculty Fellowship Award \$2500, 2008-2009 Academic Year.
- ❑ ADVANCE CEO Award, Kansas State University (2004, 2005, 2006, 2007, 2008, 2009 total \$6,533)
- ❑ ADVANCE Distinguished Lecture Series grant (2004, 2005, 2006, 2007, total around \$4,800)
- ❑ Travel Fund Awards, Department of Statistics, Penn State (2002, 2003, 2004)

□ Vollmer-Kleckner Scholarship, Department of Statistics, Penn State, 2001

Courses Taught at K-State

My standard teaching loads are four courses per academic year (two courses per semester). Among the courses listed below, Stat 902 and 903 are newly developed Ph.D core courses; the two Stat 950's are new graduate level special topics courses.

Undergraduate level courses:

Stat 490: Statistics for Engineering I (Spring 2007, Fall 2007, Fall 2011)

Stat 510: Introductory Probability and Statistics I (Fall 2004)

Graduate level courses:

Stat 702: Statistical Methods for the Social Sciences (Spring 2005, Spring 2006, Spring 2010)

Stat 703: Statistical Methods for Natural Scientists (Fall 2009, Fall 2010)

Stat 706: Basic Elements of Statistical Theory (Fall 2004, Fall 2005, Fall 2006)

Stat 716: Nonparametric Statistics (Fall 2011)

Stat 726: Introduction to Splus/R computing (Spring 2009)

Stat 745: Statistical Graphics (Spring 2006 (2nd half), Spring 2008, Spring 2010, Spring 2012)

Stat 770: Theory of Statistics (Fall 2006, Fall 2008)

Stat 825: Numerical Methods in Statistics (Spring 2011)

Stat 902: Generalized Lineal Models (Spring 2005, Spring 2007, Spring 2009)

Stat 903: Spatial and Longitudinal Data Analysis (Fall 2005, Fall 2007, Fall 2009, Spring 2011)

Stat 950: Data Mining (Spring 2006, Fall 2010)

Stat 950: Special topics on hypothesis testing in high-dimensional data (Spring 2005)

Stat 981: Advanced Inference (Spring 2012)

Student Advising

I have been the major professor for seven Ph.D. students and eight master students. Three of my Ph.D. students successfully finished their degree and found their career in academia.

Ph.D. students:

- George von Borries (Defended in Feb. 2008. Current job: Assistant Prof., Univ. of Brasilia)
- Ke Zhang (Defended in Dec. 2008. First job: Abbott Laboratories. Second job starting in Nov. 2009: Tenure track Assis. Prof., Univ. of North Dakota)
- Siti Tolos (Defended is Nov 2010, First job: International Islamic Univ. of Malaysia.)
- Grace Lee (program of study approved)
- Girly Ramirez (program of study approved)
- Mohammed Gharaibeh (program of study filed in Spring, 2011)
- Mohammad Santout (program of study filed in Summer, 2011)

Master students

- Lei Dong (Defended in Dec. 2009). First job: Statistician in K.U. Medical Center, Department of Internal Medicine.
- Sharad Silwal (Defended in Dec. 2009). Currently Ph.D. student in Mathematics, KSU.
- Lee Goerl (program of study approved in Dec. 2008).
- Grace Lee (program of study approved in Fall 2010; degree awarded Fall 2010).
- Santosh Ghimire (Defended in Spring 2011). Currently Ph.D. student in Mathematics, KSU.
- Liang Peng ((program of study filed in Spring 2011; Defended in Summer 2011. Currently: Ph.D. student in Computer Science, Utah State Univ.).
- Dustin Maurer (program of study filed in Spring, 2011; Defended in Summer 2011. Currently: Ph.D. student in Bioinformatics, University of Kansas).

- Eric Mann (program of study filed in Summer, 2011; Defended in Fall 2011. First Job: Consultant, a private firm at Kansas City).

Student Committees Served

Ying Liu (Ph.D., Statistics), Wijith (Ph.D., Statistics), Champa Magalla (Ph.D. Statistics), Nishantha Samarakoon (Ph.D. Statistics), Zhongwen Tang (Ph.D. Statistics), Mike Anderson (Ph.D. Statistics), Edwin Nudm (Ph.D. Statistics), Champa Magalla (Ph.D. Statistics).

Zanying Zhong (M.S., Statistics), Tej Shrestha (M.S. Statistics, June 2010), Jianjun Hua (M.S. Fall 2011) Lixia Fan (M.S. Statistics, April 2010), Xiuqin Bai (M.S. Statistics, June 2010), John Richards (M.S. Statistics, May 2010), Sam Wilson (M.S., Statistics).

Prashanth Boddhireddy (Ph.D., Plant Pathology), Zhigang Guo (Ph.D., Plant Pathology), Nikhil Churi (Ph.D., Industrial and Manufacturing Systems Engineering), Yu Jiang (Ph.D., Human Nutrition), Na Qin (Ph.D., Industrial and Manufacturing Systems Engineering), Yaseen Alhaj-Yaseen (Ph.D., Economics), Aobo Dong (M.S., A.Q. Miller School of Journalism & Mass Communications) Reddy Prashanth (Ph.D. Plant Pathology).

Outside chair for Alexey V. Ferapontov (Ph.D., Physics).

Service to the Department

Applied Statistics in Agriculture Conference, Chair for local arrangement (Spring 2010 -current)
 Qualifying exam committee (August 2007-Spring 2008, Chair; Fall 2008-Summer 2009, member)
 Department Head search committee (Fall 2007- Spring 2008)
 Undergraduate assessment committee (Fall 2007-current)
 Seminar Chair (Dec. 2004 - May 2006, Aug. 2009- Dec. 2009, Aug. 2011 - Dec. 2011)
 Student Progress Committee (Dec. 2005 - May 2007)
 Faculty Search Committee (Spring 2006, Spring 2007, Fall 2010)
 Undergraduate Lead Advisor (August 2005 - August 2007)
 Statistics in Agriculture - local arrangements (Fall 2009-Spring 2010)
 Departmental scholarships and awards (Fall 2009-Spring 2010)
 Library liaison (Fall 2009-Spring 2010)

Professional Membership and Service

Served as a member of the Advisory Committee for a NIH proposal by Venkat N Gudivada (Engineering and Computer Science Professor, Marshall University), Elizabeth Wells (Math/Stat professor, University of Arkansas at Pine Bluff) and Dhana Rao (Biology professor, Marshall University).

Served as a member for International Biometric Society Young Statistician Showcase committee for IBC 2012 in Kobe, Japan.

Jan. 2012 - current, Elected member of the International Statistical Institute (ISI).

Jan. 2011 - current, Associate Editor for Journal of Nonparametric Statistics.

Dec. 2011 - current, Associate Editor for Open Journal of Statistics.

April 2011 - current, Review Editor for Frontiers in Bioinformatics and Computational Biology.

April 2007- March 2008, Treasurer of ASA Kansas-Missouri Section.

Served as a member for International Biometric Society Young Statistician Showcase Committee. In charge of selecting the Best Student Paper Award from all applicants in the continent of America attending IBC 2012 in Kobe, Japan.

Served as a referee for Journal of the American Statistical Association, Statistica Sinica, Annals of

Applied Statistics, Journal of Nonparametric Statistics, Statistica Neerlandica, Journal of Classification.

Book reviewer for Prentice Hall manuscript "Introduction to Mathematical Statistics" by Ramachandran, Rao, and Tsokos.

Other synergistic activities

- Participated in a NSF IGERT preliminary proposal to promote interdisciplinary training on ecological genomics for graduate students in Biology (2008).
- Representative for a multi-department effort on Bioinformatics Minor curriculum for K-State undergraduate students. Made a sample program of study for Statistics major (2008).
- Co-organizer for Kansas State Sorghum Translational Genomics Symposium (2009).
- Provide statistical analysis for the following projects (2008-current):
 - Comparison of Hessian fly interaction with rice, barley, and wheat
 - Lipid analysis during Hessian fly interaction with resistant and susceptible wheat
 - Role of reactive oxygen species in plant defense against Hessian fly
 - Gene expression and tiling array data analysis during Hessian fly interaction with rice and wheat.
 - Virulence analysis of Hessian fly populations from Texas, Oklahoma, and Kansas

Computer Skills

- Very strong in R/Splus; familiar with SAS, Minitab; some experience on SPSS.
- Languages: C, Fortran, Pascal.
- Applications: L^AT_EX, common Windows database, spreadsheet, and presentation software