

Dan Shen

CONTACT INFORMATION	Department of Mathematics & Statistics University of South Florida http://math.usf.edu/faculty/dshen/	<i>Email:</i> danshen@usf.edu <i>Phone:</i> (813) 974-5062
EDUCATION AND TRAIN	Postdoctoral Fellow Department of Biostatistics and Biomedical Research Imaging Center, University of North Carolina at Chapel Hill Advisor: Prof. Hongtu Zhu	2012-2014
	Ph.D. in Statistics Department of Statistics & Operations Research, University of North Carolina at Chapel Hill Advisors: Prof. J.S. Marron and Prof. Haipeng Shen	2012
	M.S. in Probability and Statistics Chinese Academy of Sciences Advisor: Prof. Xiaoyu Hu	2007
	B.S. in Mathematics Education School of Mathematics, Soochow University	2004
PROFESSIONAL EXPERIENCE	Assistant Professor (tenure track) , Department of Mathematics & Statistics, University of South Florida	2014-Present
RESEARCH INTERESTS	<ul style="list-style-type: none">• Neuroimaging Statistics, Bioinformatics• Machine Learning• Functional Data Analysis, Multivariate Analysis, High Dimensional Inference	
HONORS AND AWARDS	<ul style="list-style-type: none">• IMS Laha Travel Award• IMS Laha Travel Award• Hoeffding Award (Ranked No 1 in statistics among the first year graduate students), UNC-CH• School Award (Ranked No 1 in statistics and probability among the first year graduate students), Chinese Academy of Sciences• Outstanding Graduate, Soochow University• Third Rank Major Scholarship, Soochow University• Outstanding class president, Soochow University	2012 2011 2008 2006 2004 2003 2003
GRANT SUBMITTED AND PENDING:	PI , Simons Collaboration Grants for Mathematicians PI , Elsevier Mathematical Sciences Sponsorship Fund PI , AMS-Simons Travel Grants New Researcher Grant (Role: PI) , Statistical Modeling for Neuroimaging and Genetic Data Analysis NIH R21 grant (Role: Co-Investigator) , FE65-Tip60 Acetylase Complex is a Metastatic Barrier of Breast Tumorigenesis DOD grant (Role: Co-Investigator) , The FE65-Tip60 Complex Functions as a Metastatic Barrier of Breast Tumorigenesis NIH R15 grant (Role: Co-Investigator) , Development novel algorithms and an Online web server for the identification of drug	2017 12/2016 2016 2016 2015 2015 2015

RESEARCH
EXPERIENCE:

Postdoctoral Fellow, Department of Biostatistics and Biomedical Research Imaging Center, UNC-CH
2012-2014

- *Topics*: Brain image and genetic data analysis, sparse low rank regression analysis and variable selection in neuroimaging and genetic data analysis.

Research Assistant, Neurodevelopmental Disorders Research Center, School of Medicine, UNC-CH
Summer 2012

- Cross-sectional cortical thickness and surface area study: determine the relationship between cortical thickness (CT) and surface area (SA) with Mullens developmental scores of babies at years 1 and 2.

Graduate Fellow, Statistical and Applied Mathematical Sciences Institute 2010-2011

- Served as the lead data analyst for Human Brain Artery Trees.

Research Assistant, Department of Microbiology and Immunology and Center for AIDS Research, UNC-CH
Summers 2010 and 2011

- Build a probability model for genomic problem.

Data Analyst, Self-Help (non-profit agency) Summer 2009

- Applying logistic regression to financial data.

CONSULTING
EXPERIENCE:

- Statistical consulting for Drs. Paul Emile Rossouw and Micheal Webb, School of Dentistry, UNC-CH 2014
- Statistical consulting for Lilian Calderon (Associate Professor), the Department of Biomedical and Pharmaceutical Sciences, the University of Montana 2013
- Statistical consulting for Abigail E. Miller (PharmD), UNC Eshelman School of Pharmacy (using backward selection method to do logistic regression analysis). 2009
- Statistical consulting for Lisa Dinkins (PharmD) and Kelly Scolaro (PharmD), UNC Eshelman School of Pharmacy (Design the statistical test to analyze clients' data). 2008

GRADUATE
STUDENTS:

Department of Mathematics and Statistics, University of South Florida

Ph.D student:

- Sanders, Houston (co-advisor with Prof. Kandethody M. Ramachandran), (on going)

Master students:

- Xiaochuang Zhao, Master's Student in Statistics, "Ensemble Learning Method on Marchine Maintenance Data" November, 2015
- Wei Chen, Master's Student in Statistics, "Analysis of Rheumatoid Arthritis Data using Logistic Regression and Penalized Approach" November, 2015

DEPARTMENT AND UNIVERSITY SERVICE: **University of South Florida**

UNIVERSITY SERVICE:

1. **Ph.D Committee**, 2014-Present

- Ran Zhang, Ph.D. Student in industrial and management systems engineering, "Decision support models for a few critical problems in transportation system design and operations" Oct, 2016
- Bhikhari Prasad Tharu, Ph.D. Student in statistics, "Statistical Analysis and Modeling Health Data: A Longitudinal Study" Jun, 2016
- Sherlene Enriquez Savery, Ph.D. Student in statistics, "Statistical Analysis of a Risk Factor in Finance and Environmental Models for Belize" Jun, 2016
- Xing Wang, Ph.D. Student in statistics, "Time Dependent Kernel Density Estimation: A New Parameter Estimation Algorithm, Applications in Time Series Classification and Clustering" May, 2016
- Joy D' Andrea, Ph.D. Student in statistics, "A Statistical Analysis of Hurricanes in the Atlantic Basin & Sinkholes in Florida" March, 2016

- Taysseer Sharaf, Ph.D Student in statistics, “Statistical Learning with Artificial Neural Networks Applied to Health and Environmental Data” April, 2015
- Ph.D students in statistics: Pulahinge Hansa S. Rodrigo, Abolfazl Saghafi, Bhikhari Tharu and Xing Wang
- Ph.D student in computer sciences: Ian Markwood

2. **Committee** 2014-2015
 - The joint Graduate Program with Biostatistics from the College of Public Health
 - Strategic Plan for the Statistics Program
3. **Assistant Director**, Statistical Consulting and Analytics Group 2014-Present
4. **Judge**, MCOM Masters Students 2015 Research Day Poster Competition 02/10/2015

PROFESSIONAL SERVICE:

Session Chair, 2015 Annual Florida Chapter Meeting of ASA Program 2015

TEACHING EXPERIENCE:

- Assistant Professor**, University of South Florida 2014-Present
- STA 6746 Multivariate Analysis Fall 2016
 - STA 4702 Multivariate Statistical Methods Fall 2016
 - STA 4442-Introduction to Probability Spring 2016
 - MAT 6908 Independent Study Fall 2015
 - MAT 6971 Thesis: Master’s Fall 2015
 - STA 6746 Multivariate Analysis Fall 2015
 - STA 4702 Multivariate Statistical Methods Fall 2015
 - STA 4442-Introduction to Probability Fall 2015
 - STA 4442-Introduction to Probability Spring 2015
 - STA 4442-Introduction to Probability Fall 2014
- Instructor**, UNC-Chapel Hill 2011-2013
- Guest lecturer for Nonparametric Smoothing and Functional Data Analysis Sep 24, 2013
 - Guest lecturer for Object Oriented Data Analysis Oct 11, 2012
 - STOR 151- Basic Statistics Summer 2012
 - STOR 151- Basic Statistics Fall 2011
- Instructional Assistant**, UNC-Chapel Hill 2007-2011
- STOR 155- Basic Statistics (twice) Summer 2011
 - STOR 655- Statistical Theory (core Ph.D course) Spring 2009
 - STOR 634- Measure Theory (core Ph.D course) Fall 2008
 - STOR 155- Basic Statistics Spring 2008
 - STOR 151- Basic Statistics Fall 2007
- Instructional Assistant**, Chinese Academy of Sciences 2004-2007
- Advanced Probability (graduate course) Fall 2006
 - Real and Function Analysis (graduate course) Spring 2006

PUBLICATIONS

Submitted:

1. Mingyang Li, Haodong Meng and **Dan Shen** (2015). Bayesian Lifetime Modeling of Lognormal Regression Mixture With an Unknown Number of Sub-populations, *submitted to Transactions on Reliability*.

Published:

2. Hongtu Zhu, **Dan Shen**, Xuewei Peng and Yufeng Liu (2016). MWPCR: Multiscale Weighted Principal Component Regression for High-dimensional Prediction, *Journal of the American Statistical Association*

Association, accepted.

3. Makoto Aoshima, **Dan Shen**, Haipeng Shen, Kazuyoshi Yata, Yihui Zhou and J. S. Marron (2016). A Survey of High Dimension Low Sample Size Asymptotics, *Australian & New Zealand Journal of Statistics, accepted.*
4. Dakun Shen, Ian Markwood, **Dan Shen** and Yao Liu (2016). Virtual Safe: Unauthorized Movement Detection for Mobile Devices, *IEEE CNS 2016 conference, accepted.*
5. **Dan Shen**, Haipeng Shen and J. S. Marron (2016). A general framework for consistency of principal component analysis, *Journal of Machine Learning Research, 17, 1-34.*
(**An early version of this paper won 2012 IMS Laha Travel Award**)
6. Guorong Wu, Xuewei Peng, Shihui Ying, Qian Wang, Pewthian Yap, **Dan Shen**, and Dinggang Shen (2016). eHUGS: Enhanced Hierarchical Unbiased Graph Shrinkage for Efficient Groupwise Registration, *PLOS ONE, 11, e0146870.*
7. **Dan Shen**, Haipeng Shen, Hongtu Zhu and J. S. Marron (2015). The Statistics and Mathematics of High Dimension Low Sample Size Asymptotics, *Statistica Sinica, accepted.*
8. Yin Lu, **Dan Shen**, Maxwell Pietsch, Chetan Nagar, Zayd Fadli, Hong Huang, YiCheng Tu and Feng Cheng (2015). A novel algorithm for analyzing drug-drug interactions from MEDLINE literature, *Scientific Reports, 5, 17357–17357.*
9. **Dan Shen** and Hongtu Zhu (2015). Spatially weighted principal component regression for high-dimensional prediction, *International Conference on Information Processing in Medical Imaging, 9123, 758–769.*
10. **Dan Shen**, D.P. Dittmer and J. S. Marron (2015). The limits of multiplexing, *WIREs Computational Statistics, 7(6), 394-399.*
11. **Dan Shen**, Haipeng Shen, Shankar Bhamidi, Yolanda Munoz-Maldonado, Yongdai Kim and J. S. Marron (2014). Functional data analysis of tree data objects, (**Featured Article**) *Journal of Computational and Graphical Statistics, 23, 418-238.*
(* **one of ten articles chosen as finalists by Taylor & Francis for their inaugural Mathematics & Statistics Readers' Award 2015**)
12. Hanwen Huang, Yufeng Liu, J. S. Marron, **Dan Shen** and Haipeng Shen (2013). Invited discussion: Large covariance estimation by thresholding principal orthogonal complements, *Journal of the Royal Statistical Society Series B, forthcoming.* (* **authors ordered alphabetically**)
13. **Dan Shen**, Haipeng Shen and J. S. Marron (2013). Consistency of Sparse PCA in high dimension, low sample size contexts, *Journal of Multivariate Analysis, 115, 317-333.*
(**An early version of this paper won 2011 IMS Laha Travel Award**)
14. **Dan Shen**, Xiaoyu Hu (2011). The Multifractal Structure of the product of two stable occupation measures, *Statistics and Probability Letters, 81, 478-488.*
15. Lingtao Kong, **Dan Shen** and Xiaoyu Hu (2009). The fractal structures of the exceptional sets of lévy processes, *Science in China Series A: Mathematics, 52, 1459-1466.*
16. **Dan Shen** (2008). The multifractal structure of the projection of two independent stable occupation measures. *Journal of the Graduate School of the Chinese Academy of Sciences, 25, 145-150.* (in Chinese)

Technical Reports:

17. **Dan Shen**, Haipeng Shen, Hongtu Zhu and J. S. Marron (2013). High dimensional principal component scores and data visualization.

18. **Dan Shen**, Haipeng Shen, Hongtu Zhu and J. S. Marron (2013). Surprising asymptotic conical structure in critical sample eigen-directions.
19. **Dan Shen**, Haipeng Shen and Hongtu Zhu (2013). Sparse low rank regression analysis.

In Preparation:

20. **Dan Shen**, Sally Hamami, Gustavo Gryzinski, Yin Lu and Feng Cheng (2015). Identification of genetic biomarkers for brain cancer development.
21. **Dan Shen** and Hongtu Zhu (2015). Longitudinal low rank regression for Longitudinal imaging genetic data.
22. **Dan Shen**, Haipeng Shen and J. S. Marron (2015). General support set and direction consistency of sparse PCA.
23. Lilian Calderón-Garcidueñ, Eleonore Blaurock-Busch, Yvette Busch, Maricela Franco-Lira, Mariana Aragón-Flores, Hongtu Zhu, **Dan Shen**, et al (2015). Brain, epithelial barrier and environmental pollutant autoantibodies and children: Impact on Neurodegeneration.

PRESENTATIONS

Invited:

- Dimension Reduction of Neuroimaging Data Analysis, Department of Statistics, Florida State University 10/2016
- Dimension Reduction of Neuroimaging Data Analysis, QHS 2016 Research Conference on “Challenges and Advances on Big Data in Neuroimaging” 08/2016
- Dimension Reduction for Big Data Analysis, Department of Mathematics, ICSA Applied Statistics Symposium 06/2016
- Statistical Analysis of Neuroimaging Data, University of Maryland, School of Medicine 06/2016
- Dimension Reduction for Big Data Analysis, Department of Mathematics, Northeastern University 01/2016
- Dimension Reduction for Big Data Analysis, Department of Statistics, University of Pittsburgh 10/2015
- MWPCR: Multiscale Weighted Principal Component Regression for High-dimensional Prediction, the International Society for Non-Parametric Statistics (ISNPS) 07/2015
- Spatially weighted principal component regression for high- dimensional prediction, the 24th biennial international conference on Information Processing in Medical Imaging (IPMI 2015) 07/2015
- Identification of genetic biomarkers for brain cancer development, 2015 USF Research Day Poster Competition 02/2015
- Dimension Reduction for Big Data Analysis, 2015 Annual Florida Chapter Meeting of ASA program. 02/2015
- Dimension Reduction for Big Data Analysis, Department of Biostatistics and Bioinformatics, Moffitt Cancer Center. 12/2014
- Dimension Reduction for Big Data Analysis, USF Interdisciplinary Statistical Science Group Seminar Series . 10/2014
- PCA Asymptotics and Application to Image Analysis, Department of Mathematical and Statistical Sciences, University of Colorado Denver. 03/2014

- PCA Asymptotics and Application to Image Analysis, Department of Mathematics and Statistics, University of South Florida. 03/2014
- PCA Asymptotics and Application to Image Analysis, Department of Mathematics, Ohio University. 03/2014
- PCA Asymptotics and Application to Image Analysis, Department of Mathematics, Washington University in St. Louis. 02/2014
- PCA Asymptotics and Application to Image Analysis, Department of Mathematics and Computer Science, University of Missouri-St. Louis. 02/2014
- PCA Asymptotics and Application to Image Analysis, Department of Mathematical Sciences, Florida Atlantic University. 02/2014
- PCA Asymptotics and its Application, Department of Mathematical Sciences, New Mexico State University. 12/2013
- A general asymptotic framework for consistency of PCA and sparse PCA, Joint Statistical Meetings - American Statistical Association, San Diego, CA. 08/2012
- PCA asymptotics and analysis of tree data, Department of Statistics, George Washington University. 03/2012
- General framework for consistency of PCA and sparse PCA, Department of Statistics, Oklahoma State University. 03/2012
- General framework for consistency of PCA and sparse PCA, Department of Statistical Science, Duke University. 02/2012
- General framework for consistency of PCA and sparse PCA, Department of Mathematics, Boise State University. 02/2012
- Consistency of PCA and sparse PCA and Analysis of tree data, Department of Mathematical Sciences, Michigan Technological University. 01/2012
- General framework for consistency of PCA and sparse PCA, Department of Mathematics, Central Michigan University. 11/2011
- Dyck path and branch length analysis, SAMSI AOOD Transition Workshop. 06/2011

Contributed:

- Surprising asymptotic conical structure in critical sample eigen-directions, ENAR Spring Meeting, Orlando, FL. 03/2013

SOFTWARE

Functional Data Analysis of Artery Trees

- A Matlab package for the analysis of human brain artery trees.
<http://www.unc.edu/~dshen/Tree/treecode.rar>

Cross-Section Cortical Thickness and Surface Area Analysis

- A Matlab package for the brain image analysis: study the relation between cortical thickness (CT) and surface area (SA) with Mullens developmental scores, unreleased (need the permission of collaborators)

Sparse PCA in HDLSS

- A Matlab package for the sparse PCA in HDLSS.
<http://www.unc.edu/~dshen/RSPCA/spca.rar>

The limits of multiplexing

- A Matlab package for the probability model for genomics.
<http://www.unc.edu/~dshen/ml/ml.rar>

COMPUTATIONAL SKILLS

- Software: ParaView, MATLAB, R, SAS, SPSS, Latex, Windows.

PROFESSIONAL MEMBERSHIP

- American Statistical Association
- Institute of Mathematical Statistics
- Eastern North American Region, International Biometric Society

ACADEMIC SERVICE

Editorial Board Member:

- Journal of Statistics and Mathematical Sciences

Grant Reviewer:

- NSA Mathematical Sciences Grant Program

Journal Refereeing:

- Journal of the American Statistical Association
- Journal of Multivariate Analysis
- Scandinavian Journal of Statistics
- Computational Statistics
- Electronic Journal of Statistics
- Computational Statistics and Data Analysis
- Statistics and Computing
- American Statistician
- The Indian Journal of Statistics
- Technometrics
- WIREs Computational Statistics
- Australian & New Zealand Journal of Statistics
- BMC Health Services Research
- PLOS one
- Scientific Reports

REFERENCES

J.S. Marron

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Chapel Hill, NC 27599
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Hongtu Zhu

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Biostatistics Department
The University of Texas
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Haipeng Shen

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University of Hong Kong
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