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ACADEMIC APPOINTMENTS

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| Associate Professor , Department of Statistics
Virginia Tech, Blacksburg, VA | June 2016-present |
| Assistant Professor , Department of Statistics
Virginia Tech, Blacksburg, VA | May 2011-May 2016 |
| Visiting Assistant Professor , Department of Statistics
University of Wisconsin-Madison, Madison, WI | Aug. 2009 to May 2011 |

EDUCATION

- Ph.D., School of Industrial and Systems Engineering,
Georgia Institute of Technology (Aug. 2004 – Aug. 2009)

Advisors: Professor C. F. Jeff Wu and Professor Ming Yuan
Major concentration: Statistics.
Minor: Optimization.
- B.S., Mathematics,
Nanjing University, China (Sept. 1999 – July 2003).

RESEARCH INTERESTS

- Interface between machine learning and experimental design
- Data mining and machine learning
- Modeling and analysis of high-dimensional data
- Covariance matrix estimation and its applications
- Design and analysis of computer experiments
- Statistical methods for nanotechnology

PUBLICATIONS

Refereed Articles

1. **Deng, X.**, Yuan, M., and Sudjianto, A. (2007). A Note on Robust Kernel Principal Component Analysis, *Contemporary Mathematics*, **443**, 21–33.

2. **Deng, X.**, Joseph, V. R., Sudjianto, A., and Wu, C. F. J. (2009). Active Learning via Sequential Design with Applications to Detection of Money Laundering, *Journal of the American Statistical Association*, **104(487)**, 969–981.
3. **Deng, X.**, Joseph, V. R., Mai, W., Wang, Z. L., and Wu, C. F. J. (2009). A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, *Proceedings of the National Academy of Sciences*, **106(29)**, 11845–11850.
4. **Deng, X.** and Yuan, M. (2009). Large Gaussian Covariance Matrix Estimation with Markov Structures, *Journal of Computational and Graphical Statistics*, **18(3)**, 640–657.
5. Mai, W. and **Deng, X.** (2010). Applications of Statistical Quantification Techniques in Nanomechanics and Nanoelectronics, *Nanotechnology*, **21(40)**, 405704.
6. Shao, J., Wang, Y., **Deng, X.**, and Wang, S. (2011). Sparse Linear Discriminant Analysis by Thresholding for High Dimensional Data, *Annals of Statistics*, **39(2)**, 1241–1265.
7. Morgan, J.P. and **Deng, X.** (2012). Experimental Design, *WIREs Data Mining and Knowledge Discovery*, **2**, 164–172.
8. Shao, J. and **Deng, X.** (2012). Estimation in High-Dimensional Linear Models with Deterministic Covariates, *Annals of Statistics*, **40(2)**, 812–831.
9. Carbo, A., Bassaganya-Riera, J., Pedragosa, M., Viladomiu, M., Marathe, M., Eubank, S., Wendesdorf, K., Bisset, K., Hoops, S., **Deng, X.**, Alam, M., Krosnteiner, B., Mei, Y., and Hontecillas, R. (2013). Predictive Computational Modeling of the Mucosal Immune Responses during Helicobacter Pylori Infection, *PLoS ONE* **8(9)**: e73365.
10. Zhang, Q., **Deng, X.** Qian, P. Z. G., and Wang, X. (2013). Spatial Modeling for Refining and Predicting Surface Potential Mapping with Enhanced Resolution, *Nanoscale*, **5**, 921–926.
11. **Deng, X.** and Tsui, K. W. (2013). Penalized Covariance Matrix Estimation using a Matrix-Logarithm Transformation, *Journal of Computational and Graphical Statistics*, **22(2)**, 494–512.
12. Yeo, I-K, Johnson, R. A., and **Deng, X.** (2014). An Empirical Characteristic Function Approach to Selecting a Transformation to Normality, *Communications for Statistical Applications and Methods*, **21(3)**, 213–224.
13. Li, H., **Deng, X.**, Kim, D-Y, and Smith, E. P. (2014). Modeling Maximum Daily Temperature using a Varying Coefficient Regression Model, *Water Resource Research*, **50(4)**, 3073–3087.
14. Alam, M., **Deng, X.***, Philipson, C., Bassaganya-Riera, J., Bisset, K., Carbo, A., Eubank, S., Hontecillas, R., Hoops, S., Mei, Y., Abedi, V., and Marathe, M. (2015). Sensitivity Analysis of an ENteric Immunity Simulator (ENISI)-based Model of Immune Responses to *Helicobacter pylori* Infection, *PLoS ONE*, **10(9)**, e0136139.
15. Jin, R. and **Deng, X.** (2015). Ensemble Modeling for Data Fusion in Manufacturing Process Scale-up, *IIE Transactions*, **47(3)**, 203–214.
16. **Deng, X.**, Hung, Y., and Lin, C. D. (2015). Design for Computer Experiments with Qualitative and Quantitative Factors, *Statistica Sinica*, **25**, 1567–1581.

17. **Deng, X.** and Jin, R. (2015). QQ Models: Joint Modeling for Quantitative and Qualitative Quality Responses in Manufacturing Systems, *Technometrics*, **57(3)**, 320–331.
18. Wang, X., Wu, S., Wang, K., **Deng, X.**, Liu, L., and Cai, Q. (2016) A Spatial Calibration Model for Nanotube Film Quality Prediction, *IEEE Transactions on Automation Science and Engineering*, **13(2)**, 903-917.
19. Zeng, L., **Deng, X.**, and Yang, J. (2016). Constrained Hierarchical Modeling of Degradation Data in Tissue-engineered Scaffold Fabrication, *IIE Transactions*, **48(1)**, 16-33.
20. Jiang, H. J., **Deng, X.***, Lopez, V., and Hamann, H. (2015). Online Updating of Computer Model Output Using Real-time Sensor Data, *Technometrics*, to appear.
21. Li, H., **Deng, X.**, Dolloff, A., and Smith, E. P. (2016). Bivariate Functional Data Clustering: Grouping Streams based on a Varying Coefficient Model of the Stream Water and Air Temperature Relationship, *Environmetrics*, **27(1)**, 15-26.
22. Sun, H., **Deng, X.**, Wang, K., and Jin, R. (2016). Logistic Regression for Crystal Growth Process Modeling through Hierarchical Nonnegative Garrote based Variable Selection, *IIE Transactions*, *accepted*.
23. **Deng, X.**, Lin, C. D., Liu, K-W, and Rowe, R. K. (2016). Additive Gaussian Process for Computer Models with Qualitative and Quantitative Factors, *Technometrics*, *accepted*.

Refereed Conference Papers

24. Lozano, A. C., Jiang, H. J., and **Deng, X.** (2013). Robust Joint Sparse Estimation of Multiresponse Regression and Inverse Covariance Matrix, *19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2013)*, 293-301.
25. Jiang, H. J., **Deng, X.**, Lopez, V., and Hamann, H. (2013). A Statistical Approach to Real-time Updating and Automatic Scheduling of Physical Models, *ASME 2013 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems*, IPACK2013-73042.
26. Nino-Ruiz, E. D., Sandu, A., and **Deng, X.** (2015). A Parallel Ensemble Kalman Filter Implementation based on Modified Cholesky Decomposition. *The 6th Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA'15)*, Article 4. DOI=<http://dx.doi.org/10.1145/2832080.2832084>.

Book Chapter

27. Moon, J. Y., Chaibub Neto, E., **Deng, X.**, and Yandell, B. S. (2014). Bayesian Causal Phenotype Network Incorporating Genetic Variation and Biological Knowledge, in *Probabilistic Graphical Models for Genetics, Genomics and Postgenomics*, Oxford University Press.
28. Michalak, P., Sobral, B. W., Abedi, V., Kim, Y-B., **Deng, X.**, Philipson, C., Viladomiu, M., Lu, P., Wendelsdorf, K., Hontecillas, R. and Bassaganya-Riera, J. (2015). From Big Data Analytics and Network Inference to Systems Modeling, in *Computational Immunology: Models and Tools*, *Elesvier*.

29. Alam, M., Abedi, V., Bassaganya-Riera, J., Wendelsdorf, K. Bisset, K., **Deng, X.**, Eubank, S., Hontecillas, R., Hoops, S., Marathe, M. (2015). Agent-Based Modeling and High Performance Computing, in *Computational Immunology: Models and Tools*, Elsevier.

Papers Submitted

30. Kang, L., **Deng, X.**, and Jin, R. (2015). Bayesian D-Optimal Design of Experiments with Quantitative and Qualitative Responses, revision for *Journal of the American Statistical Association*.

31. **Deng, X.** and Qian, P. Z. G. (2015). Designs of Simulation Experiments for Estimating Error Rate of a Classification Rule, revision for *Technometrics*.

32. Li, H., **Deng, X.**, and Smith, E. P. (2015). Modeling and Clustering Paired Stream and Air Temperature Sensor Data with Missing Data, revision for *Environmetrics*.

33. Zhang, A., **Deng, X.**, Wang, J., and Hobart, J. (2015). A Two-stage Risk Model Construction and Evaluation in Reject Inference, submitted to *Annals of Applied Statistics*.

34. Jin, R. and **Deng, X.** (2015). Dynamic Quality Models for Manufacturing Systems Considering Equipment Degradation, submitted to *Journal of Quality and Technology*.

35. Zhang, A. and **Deng, X.** (2015). A Regularized Approach to Sparse Linear Discrimination Analysis for Two-class Classification, submitted to *Computational Statistics and Data Analysis*.

36. Lozano, A. C., Jiang, H. J., and **Deng, X.** (2015). Log-Nonlinear Formulations for Robust High-dimensional Modeling, submitted to *Log-Linear Models, Extensions and Applications*, MIT Press.

37. **Kang X.**, **Deng X.**, Tsui K. and Pourahmadi, M (2016). Order-Averaged Cholesky-GARCH Models: Comparison of Asset Ordination Methods, submitted to *Journal of Business & Economic Statistics*.

38. Wu, H., **Deng, X.**, and Ramakrishnan, N. (2016). Sparse Estimation of Multivariate Poisson Log-Normal Model and Inverse Covariance for Counting Data, submitted to *NIPS 2016*.

39. Zeng, L. and **Deng, X.** (2016). A Constrained Gaussian Process Approach to Modeling Tissue-engineered Scaffold Degradation, submitted to *IIE Transactions*.

40. Nino-Ruiz, E. D., Sandu, A., and **Deng, X.** (2016). A Parallel Ensemble Kalman Filter Implementation Based on Modified Cholesky Decomposition, submitted to *Journal of Computational Science*.

41. **Deng, X.**, Hung, Y., and Lin, C. D. (2016). Design and Analysis of Computer Experiments, submitted to book chapter of *Handbook of Research on Applied Cybernetics and Systems Science*, IGI Global.

GRANTS

G1. Modeling and Quality Control for Manufacturing Big Data System, **Procter & Gamble Co.**, Co-PI, \$50,000, 08/01/2015-07/31/2016. (50% credit)

G2. Collaborative Research: Experimental Design and Analysis of Quantitative-Qualitative Responses in Manufacturing and Biomedical Systems, **NSF-CMMI-1435996**, Co-PI, \$226,020, 09/01/14-08/31/17. (50% credit)

G3. Collaborative Research: A Statistics-Guided Framework for Synthesis and Characterization of Nanomaterials, **NSF-CMMI-1233571**, PI, \$123,192, 09/01/12-08/31/15. (100% credit)

G4. Empirical Model Validation for Thermal Spray Coating Processes, **CCAM** (Commonwealth Center for Advanced Manufacturing), PI, \$60,754, 08/11/2014-08/03/2015. (50% credit)

G5. An Integrated Modeling Framework for Thermal Spray Processes, **CCAM** (Commonwealth Center for Advanced Manufacturing), Co-PI, \$35,000, 02/04/2013-03/31/2014. (50% credit)

G6. Ensemble Modeling for Continuous Fiber Manufacturing, Chengdu Jiyi Technology Co. Ltd., Co-PI, \$60,000, 07/10/2013-09/10/2014. (50% credit)

STUDENT ADVISING

As Ph.D. Advisor

Completed

- Han Li (Ph.D. in Statistics at Virginia Tech), “Statistical Modeling and Analysis of Bivariate Spatial-Temporal Data with the Application to Stream Temperature Study”, October, 2014 (Co-advisor: Eric Smith).
- Angang Zhang (Ph.D. in statistics at Virginia Tech), “Some Advances in Classifying and Modeling Complex Data”, November, 2015.

Current

- Xiaoning Kang (Ph.D. in statistics, expected spring 2016)
- Shuyu Chu (Ph.D. in statistics, expected spring 2017)
- Sumin Shen (Ph.D. in statistics, expected spring 2019)

TEACHING EXPERIENCE

Department of Statistics, Virginia Tech

Fall 2015, Stat 5504 – Multivariate Methods (SPOT Overall: 5.71/6)

Spring, 2015, Stat 5204 – Experimental Design and Analysis (SPOT Overall: 4.96/6)

Fall 2014, Stat 5504 – Multivariate Methods (SPOT Overall: 5.67/6)

Spring 2014, Stat 5304 – Statistical Computing (SPOT Overall: 5.71/6)

Spring, 2014, Stat/CS 5526–Data Analytics II (SPOT Overall: 5.75/6)

Spring, 2013, Stat 6424 – Advanced Multivariate Analysis (SPOT Overall: 6/6)

Fall 2012, Stat 5504 – Multivariate Methods (SPOT Overall: 4.93/6)

Spring 2012, Stat 5304 – Statistical Computing (SPOT Overall: 5/6)

Fall, 2011, Stat/CS 5525 – Data Analytics I (SPOT Overall: 5.20/6)

ACADEMIC AWARDS & SCHOLARSHIPS

- Recipient of Mentoring Project Award, Virginia Tech, 2012.
- Nomination for Council Member of the INFORMS at Data Mining (DM) Section, 2012.
- Nomination for 3M Non-Tenured Faculty Award, 2012.
- NSF Travel Support, International Conference on Robust Statistics (ICORS), 2012.
- Finalist of best student paper competition organized by the Quality, Statistics, and Reliability (QSR) Section of INFORMS 2008 Annual Meeting.
- QPRC Student Scholarship, Quality and Productivity Research Conference, 2008.
- DAE Conference Support for Junior Researchers, Design and Analysis of Experiments Conference, 2007.
- JRC Student Scholarship, Joint Research Conference, 2006.
- Kiplinger Fellowship, Georgia Institute of Technology, 2004, 2005.

INVITED TALKS

- Bayesian D-Optimal Design of Experiments with Quantitative and Qualitative Responses, ICSA Applied Statistics Symposium, 2016, Atlanta, GA.
- Online Updating of Computer Model Output Using Real-time Sensor Data, Department of Statistical Sciences and Operational Research, Virginia Commonwealth University, 2015, Richmond, VA.
- Additive Gaussian Process for Computer Models with Qualitative and Quantitative Factors, IMS-China International Conference on Statistics and Probability, 2015, Kunming, China.
- Online Updating of Computer Model Output Using Real-time Sensor Data, the Fifth International Workshop on Reliability Technology and Quality Science, 2015, Beijing, China.
- A Two-stage Risk Modeling in Reject Inference, Department of Industrial and Systems Engineering, Virginia Tech, 2015, Blacksburg, VA.
- A Two-Stage Model Building and Evaluation in Reject Inference, Department of Applied Mathematics, Illinois Institute of Technology, 2015, Chicago, IL.
- Spatial Data Classification in Biomedical Thermal Images, INFORMS Annual Meeting, 2014, San Francisco, CA.
- Bayesian Variable Selection for Computer Experiments, Conference on Experimental Design and Analysis (CEDA) 2014, Taipei, Taiwan.
- Joint Modeling for Mixed Quality Responses in the Manufacturing System, Department of Industrial and Systems Engineering, Virginia Tech, 2013, Blacksburg, VA.
- QQ Model: Joint Modeling with Quantitative and Qualitative Responses in Manufacturing Scale-up, INFORMS Annual Meeting, 2013, Minneapolis, MN.

- Robust Estimation for Sparse Multivariate Regression, School of Mathematics, Peking University, 2012, Beijing, China.
- Robust Estimation for Gaussian Graphical Model and Sparse Multivariate Regression, International Conference on Robust Statistics (ICORS), 2012, Burlington, Vermont.
- Modeling and Analysis of and Analysis of High-Dimensional Data, School of Mathematics Beijing Institute of Technology, 2012, Beijing, China.
- Online Computer Model Updating with Application to Data Center Thermal Management, The Second International Conference on the Interface between Statistics and Engineering (ICISE2), 2012, Tainan, Taiwan.
- Log Covariance Matrix Estimation, Department of Statistics, Texas A&M University, 2012, College Station, TX.
- A Two-stage Modeling Strategy to Quantify Potential Distribution on 2D Nanowire Topography Surface, INFORMS 2011, Charlotte, NC.
- Experimental Designs for Statistical Learning, Joint Statistical Meetings (JSM), 2011, Miami Beach, FL.
- Penalized Covariance Matrix Estimation using a Matrix-Logarithm Transformation, Spring Research Conference (SRC), 2011, Chicago, IL.
- Sliced Latin Hypercube Designs, Quality and Productivity Research Conference (QPRC), 2011, Roanoke, VA.
- Log Covariance Matrix Estimation, the Fourth Erich L. Lehmann Symposium, 2011, Houston, TX.
- Research in Machine Learning: Active Learning via Sequential Design and Log Covariance Matrix Estimation, Department of Mathematics and Statistics, Portland State University, 2011, Portland, OR.
- Experimental Design for Machine Learning, Department of Statistics and Actuarial Science, University of Waterloo, 2011, Waterloo, Canada.
- Experimental Design for Machine Learning, Department of Statistics, University of Pittsburgh, 2011, Pittsburgh, PA.
- Experimental Design for Machine Learning, Department of Statistics, George Mason University, 2011, Fairfax, VA.
- Experimental Design for Machine Learning, Department of Statistics, Virginia Tech, 2011, Blacksburg, VA.
- Improvement on Cross-Validation via Sliced Statistical Design, INFORMS 2010, Austin, TX.

- A Statistical Approach to Modeling the Potential Data in Nano-quantification, INFORMS 2010, Austin, TX.
- Large Gaussian Covariance Matrix Estimation with Markov Structures, Joint Statistical Meetings (JSM), 2010, Vancouver, Canada.
- Statistical Quantification in Nanomaterials, First International Workshop on Reliability Technology and Quality Science (IWRTQS), 2009, Beijing, China.
- Sparse Discriminant Analysis for Multi-categorical Classification, WNAR-IMS Meeting, 2009, Portland, OR.
- A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, Center for Quality and Applied Statistics, Rochester Institute of Technology, 2009, Rochester, NY.
- A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, Department of Statistics, Purdue University, 2009, West Lafayette, IN.
- Statistical Quantification in Nanomaterials and Research in Machine Learning, Department of Statistics, University of Wisconsin-Madison, 2009, Madison, WI.
- Research in Machine Learning: Active Learning and Covariance Matrix Estimation, Department of Mathematics, Wayne State University, 2009, Detroit, MI.
- Active Learning via Sequential Design with Applications to Detection of Money Laundering, INFORMS 2007, Seattle, WA.
- Active Learning via Sequential Design with Applications to Detection of Money Laundering, Design and Analysis of Experiments (DAE) 2007, Memphis, TN.

OTHER PRESENTATIONS

- Additive Gaussian Process for Computer Models with Qualitative and Quantitative Factors, Joint Statistical Meetings (JSM), 2015, Seattle, WA.
- Robust Sparse Estimation of Multi-Response Regression, Joint Statistical Meetings (JSM), 2013, Montreal, Canada.
- Large Gaussian Covariance Matrix Estimation, First International Conference on the Interface between Statistics and Engineering (ICISE), 2009, Beijing, China.
- Large Gaussian Covariance Matrix Estimation with Markov Structures, Spring Research Conference (SRC), 2009, Vancouver, Canada.
- A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, INFORMS 2008, Washington DC.

- Large Gaussian Covariance Matrix Estimation with Markov Structures, Joint Statistical Meetings (JSM), 2008, Denver, CO.
- A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, Quality and Productivity Research Conference (QPRC), 2008, Madison, WA.
- A Statistical Approach to Quantifying the Elastic Deformation of Nanomaterials, Spring Research Conference (SRC), 2008, Atlanta, GA.
- A Note on Robust Kernel Principal Component Analysis (Poster), SIAM International Conference on Data Mining (SDM), 2008, Atlanta, GA.
- Efficient Sequential Design Method for Detecting Money Laundering, Joint Statistical Meetings (JSM) 2007, Seattle, WA.
- Robust Kernel Principal Component Analysis, Joint Research Conference (JRC), 2006, Knoxville, TN.

PROFESSIONAL SERVICE

Editorial Board

Associate Editor for *Technometrics*: 2016-Present.

Referee and reviewer for

Annals of Statistics

Journal of the American Statistical Association

Journal of the Royal Statistical Society – Series A

Journal of the Royal Statistical Society – Series B

Journal of the Royal Statistical Society – Series C

Journal of Machine Learning Research

Journal of Computational and Graphic Statistics

Computational Statistics and Data Analysis

Biometrika

Technometrics

Statistica Sinica

Bernoulli Journal

Electronic Journal of Statistics

Scandinavian Journal of Statistics

Statistics and Its Interface

Communications in Statistics

Sankhyā B

American Statistician

IIE (Institute of Industrial Engineers) Transactions

Journal of Statistical Planning and Inference

Journal of Quality Technology

Computational Statistics

Statistical Papers
Quality Technology and Quantitative Management
Journal of Systems Science and Complexity
International Conference on Machine Learning (ICML 2015)
Conference on Neural Information Processing Systems (NIPS 2014, 2015)
International Conference on Artificial Intelligence and Statistics (AISTAT 2009, 2010, 2012, 2014, 2015)

Other Activities:

NSF Three-Day Review Panel, 2016.

NSF Three-Day Review Panel, 2015.

ASA SPES Representative Officer for Spring Research Conference: 2014-2016.

Invited Paper Session organizer, Section on Physical and Engineering Sciences of ASA for Joint Statistical Meetings (JSM), Chicago, IL, 2016.

Invited Paper Session organizer, Section of Quality, Statistics, and Reliability (QSR), INFORMS Annual Meeting, Philadelphia, PA, 2015.

Invited Paper Session organizer, Section of Quality, Statistics, and Reliability (QSR), INFORMS Annual Meeting, Minneapolis, MN, 2013.

Scientific Program Committee, IMS/ASA Spring Research Conference 2012: Enabling the Interface between Statistics & Engineering, Boston, MA, 2012.

Invited Paper Session organizer, Section of Quality, Statistics, and Reliability (QSR) INFORMS Annual Meeting, Charlotte, NC, 2012.

Invited Paper Session organizer, The 2nd International Conference on the Interface between Statistics and Engineering, Tainan, Taiwan, 2012.

Invited Paper Session organizer, IMS/ASA Spring Research Conference, Chicago, IL, 2011.

Invited Paper Session organizer, Section on Physical and Engineering Sciences of ASA for Joint Statistical Meetings (JSM), Miami, FL, 2011.

PROFESSIONAL ASSOCIATIONS

- Member of American Statistical Association.
- Member of International Chinese Statistical Association.
- Member of Institute for Operations Research and the Management Sciences (INFORMS).

COMPUTING SKILLS

- Statistical Package – R, JMP, SAS, Minitab.
- Programming Language – C&C++, Matlab, FORTRAN.