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## JACQUELINE M. HUGHES-OLIVER

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### Major Areas of Research and Applications

Prediction and Classification, Data Mining, Variable Selection and Dimension Reduction, Design of Experiments, Group Testing, Spatial Modeling; Cheminformatics and Drug Discovery, Ontology-Guided Analysis, Point Source Modeling, Transportation Modeling

### Education

- Ph.D., Statistics, North Carolina State University, Raleigh, May 1991  
Split minor: Mathematics and Operations Research  
Dissertation topic: Estimation Using Group-Testing Procedures: Adaptive Iteration  
Advisor: Dr. William H. Swallow.
- Bachelor of Arts, Magna Cum Laude with High Honors in Mathematics, University of Cincinnati, College of Arts and Sciences, Cincinnati, Ohio, June 1986.

### Research and Work Experience

- July 2006—Present: **Professor of Statistics, North Carolina State University**
- August 2011—May 2014: Professor of Statistics, George Mason University
- July 2007—June 2010: Co-Director of Graduate Programs, Department of Statistics, North Carolina State University
- Aug 2003—May 2004: SAMSI (Statistical & Applied Mathematical Sciences Institute) Faculty Fellow for the Program on Data-Mining and Machine Learning
- July 1999—June 2006: Associate Professor of Statistics, North Carolina State University
- July 1999—June 2011: Member of the Genomics Faculty, North Carolina State University
- Aug 1992—June 1999: Assistant Professor of Statistics, North Carolina State University
- Aug 1991—July 1992: Visiting Assistant Professor of Statistics, University of Wisconsin at Madison
- June 1989—May 1990: Mathematical Statistician, National Institute of Environmental Health Sciences
- May 1988—August 1988: Statistical Associate, Glaxo Incorporated
- June 1985—July 1986: Statistical Trainee, Environmental Protection Agency

### Grants

- Influence of Metal-Working Fluid Formulations on Dermal Absorption of Biocides. I was Co-Investigator, with PI Ronald Baynes. National Institutes of Health, NIH R01 OH003669. Funded at \$726,580 over period 8/1/10-8/31/13.
- Mentoring Students to Total Success. Pamela Arroway was PI. I was co-PI until 2011. National Science Foundation, NSF DUE-0806909. Funded at \$600,000 over period 9/1/08-8/31/2013.

- Comparative and Web-Enabled Virtual Screening. I was PI, with co-PIs Stanley Young and Douglas Hawkins. National Human Genome Research Institute, National Institutes of Health, Roadmap Initiative, NIH P20 HG003900. Funded at \$1,111,110 over period 9/23/05-7/31/09.
- General Data-Analysis Tools to Relate Chemical Diversity to Biological Outcomes. Paul Clemons was PI. I was Other Investigator. Oct 2005—Sept 2007. National Human Genome Research Institute, National Human Genome Research Institute, National Institutes of Health, Roadmap Initiative. Funded at about \$750,000.
- Ontology enhanced statistical analysis. GlaxoSmithKline. One month of summer 2005 salary to direct a Graduate Industrial Trainee working for GlaxoSmithKline. Funded.
- Benchmarking Computational Models for Drug Discovery: Chemical Descriptors, Model Validation, and Model Applicability Criteria. NISS APDF Proposal. \$9,600. I was PI, with co-PIs William Welch, Alex Tropsha, Yvonne Martin. Funded.
- Extension of "A Spatial Editing and Validation Process for Short Count Traffic Data." Dec 2003—June 2004. North Carolina Department of Transportation, Division of Planning and Environment. Funded at \$45,000.
- Engaging the Next Generation of Biostatisticians. (Co-PIs are Dennis D. Boos and Marie Davidian; other investigators are Andrew S. Allen, Kevin J. Anstrom, Robert M. Califf, Robert A. Harrington, Victor Hasselblad, Jacqueline M. Hughes-Oliver, William H. Swallow, Anastasios A. Tsiatis, Kimberly S. Weems, Daowen Zhang.) Sept 2003—Aug 2007. National Heart, Lung, and Blood Institute of the National Institutes of Health. Funded at \$802,560.
- Extension of "A Spatial Editing and Validation Process for Short Count Traffic Data." June 2003—Dec 2003. North Carolina Department of Transportation, Division of Planning and Environment. Funded at \$14,073.
- A Spatial Editing and Validation Process for Short Count Traffic Data. 2001—2003. North Carolina Department of Transportation, Division of Planning and Environment. Funded at \$195,954.
- Nonstationary Spatial Modeling for Multiple Point Sources with Applications to Environmental Data. I was PI, with Sujit K. Ghosh as co-PI. 2000-2004. National Science Foundation, Division of Mathematical Sciences. Funded at \$200,000.
- Statistics in Drug Discovery. 2000—2002. National Science Foundation, Division of Mathematical Sciences. Funded at \$38,378.
- Spatio-Temporal Statistical Models for the Environment. (Graciela Ma. Gonzalez Farias, in Mexico, is PI. I was co-investigator.) 2000—2001. Consejo Nacional de Ciencia y Tecnologia (CONACYT, the Mexican equivalent of the US National Science Foundation).
- Modeling and Estimation for Electronics and Semiconductor Products. (With J. C. Lu, S. Ghosh, W. C. Holton.) 1998. National Science Foundation, Division of Mathematical Sciences. Funded at \$70,000.
- Nonlinear Modeling of Spatially Correlated Data: Preliminary Investigation. 1996. National Science Foundation, Division of Mathematical Sciences. Funded at \$18,000.
- Across-stage Supervisory Process Control Systems. (With J. C. Lu, D. D. Boos, B. B. Bhattacharyya, R. S. Gyurcsik.) 1996. National Science Foundation, Division of Mathematical Sciences. Funded, but after NSF decided to fund this project I withdrew my name as co-PI to avoid conflict with the award for Nonlinear Modeling of Spatially Correlated Data: Preliminary Investigations.
- Faculty Research and Professional Development. 1992. A Uniformly More Efficient and Robust Adaptive Group-Testing Estimator for Proportions. Funded at \$3,000.

#### Grants in Support of Graduate Industrial Traineeships for which I was PI:

- Graduate Industrial Traineeship - Suraj Prakash Anand. GlaxoSmithKline. Funded at \$25,620 over period 5/16/08-12/15/08.

- Graduate Industrial Traineeship - Min Zhang. Duke Clinical Research Institute (DCRI), Duke University. Funded at \$38,400 over period 8/16/07-8/15/08.
- Graduate Industrial Traineeship - Funda Gunes. Duke Clinical Research Institute (DCRI), Duke University. Funded at \$38,400 over period 8/16/07-8/15/08.
- Graduate Industrial Traineeship - Huiping Miao. Talecris Biotherapeutics, Inc. Funded at \$36,025 over period 9/17/07-8/15/08.
- Graduate Industrial Traineeship - Paramita Saha. SAS Institute, Inc. Funded at \$40,376 over period 8/20/07-8/15/08.
- Graduate Industrial Traineeship - McKay Curtis. SAS Institute, Inc. Funded at \$44,255 over period 8/20/07-8/15/08.
- Graduate Industrial Traineeship - Carl DiCasoli. Clinsys Clinical Research, Inc. Funded at \$23,693 over period 1/7/08-8/15/08.
- Graduate Industrial Traineeship - Samuel Wilson. Clinsys Clinical Research, Inc. Funded at \$21,019 over period 2/4/08-8/15/08.
- Graduate Industrial Traineeship - Yen-Wei Li. Duke University. Funded at \$15,248 over period 1/2/08-5/15/08.
- Graduate Industrial Traineeship - Eun Hye Lee. Clinsys Clinical Research, Inc. Funded at \$39,517 over period 8/16/08-8/15/09.
- Graduate Industrial Traineeship - Jingwen Zhou. Waratah Corporation. Funded at \$7,658 over period 1/1/09-5/15/09.
- Graduate Industrial Traineeship - Jingwen Zhou. Waratah Corporation. Funded at \$12,032 over period 5/16/09-8/15/09.
- Graduate Industrial Traineeship - Yuan Li. SAS Institute, Inc. Funded at \$41,147 over period 8/16/08-8/15/09.
- Graduate Industrial Traineeship - Shuai Yuan. GlaxoSmithKline. Funded at \$43,376 over period 8/16/08-8/15/09.
- Graduate Industrial Traineeship - Muhtarjan Osman. Inspire Pharmaceuticals. Funded at \$114,929 over period 9/10/07-8/15/10.
- Graduate Industrial Traineeship - Ani Eloyan. SAS Institute, Inc. Funded at \$88,412 over period 8/16/08-8/15/10.
- Graduate Industrial Traineeship - Ian Fiske. SAS Institute, Inc. Funded at \$47,565 over period 8/16/09-8/15/10.

## Publications

### Submitted-for-Review Articles:

- **Hughes-Oliver, J.M.** 2018. The Precision-Recall Curve through the Lens of the ROC Curve.

### Refereed Articles:

- **Hughes-Oliver, J.M.** 2019. Assessment of Prediction Algorithms for Ranking Objects. *Notices of the American Mathematical Society*, 66(2), 182-190; DOI: <https://doi.org/10.1090/noti1790>
- **Hughes-Oliver, J.M.**, Guangning, X., and Baynes, R.E. 2018. Skin Permeation of Solutes from Metalworking Fluids to Build Prediction Models and Test a Partition Theory. *Molecules*, 23, 3076; doi:10.3390/molecules23123076
- Ash, J.R. and **Hughes-Oliver, J.M.** 2018. chemmodlab: A Cheminformatics Modeling Laboratory R package for Fitting and Assessing Machine Learning Models. *Journal of Cheminformatics*, 10(1):57. doi: 10.1186/s13321-018-0309-4
- **Hughes-Oliver, J.M.** 2017. Statistics in Drug Discovery. *Wiley StatsRef: Statistics Reference Online*

- **Hughes-Oliver, J.M.** 2017. Mentoring to Achieve Diversity in Graduate Programs. *The American Statistician*, 71(1), 55-60.
- **Hughes-Oliver, J.M.** and Gumpertz, M.L. 2015. The Many Facets of Leadership. In *Leadership and Women in Statistics*. A.L. Golbeck, I. Olkin, and Y.R. Gel (Eds.). Chapman and Hall/CRC, ISBN 978-1-48-223644-6.
- Gumpertz, M.L. and **Hughes-Oliver, J.M.** 2015. The Status of Women Faculty in Departments of Statistics and Biostatistics in the United States. In *Advancing Women in Science: An International Perspective*. W. Pearson, L.M. Frehill, and C.L. McNeely (Eds.). Springer, ISBN 978-3-319-08628-6.
- Xu, G., **Hughes-Oliver, J.M.**, Brooks, J.D., and Baynes, R.E. 2013. Predicting Skin Permeability from Complex Mixtures: Incorporation of an Expanded QSAR Model. *SAR and QSAR in Environmental Research*, 24(9), 711-731.
- Zhang, K., **Hughes-Oliver, J.M.**, and Young, S.S. 2013. Analysis of High-Dimensional Structure-Activity Screening Datasets Using the Optimal Bit String Tree. *Technometrics*, 55:2, 161-173.
- Xu, G., **Hughes-Oliver, J.M.**, Brooks, J.D., Yeatts, J.L., and Baynes, R.E. 2013. Selection of appropriate training and validation set chemicals for modelling dermal permeability by U-optimal design. *SAR and QSAR in Environmental Research*, 24(2), 135-156.
- **Hughes-Oliver, J. M.**, Brooks, A. D., Welch, W. J., Khaledi, M. G., Hawkins, D., Young, S. S., Patil, K. Howell, G. W., Ng, R. T., Chu, M. T. 2012. ChemModLab: a web-based cheminformatics modeling laboratory. *In Silico Biology*, 11(1-2), 61-81
- Shen, H., Welch, W.J., **Hughes-Oliver, J.M.** 2011. Efficient, Adaptive Cross-Validation for Tuning and Comparing Models, with Application to Drug Discovery. *Annals of Applied Statistics*. 5(4), 2668-2687.
- Nail, A.J., **Hughes-Oliver, J.M.**, Monahan, J.F. 2011. Quantifying Local Creation and Regional Transport using a Hierarchical Space-Time Model of Ozone as a Function of Observed NOx, a Latent Space-Time VOC Process, Emissions, and Meteorology. *Journal of Agricultural, Biological, and Environmental Statistics*, 16(1), 17-44.
- Heo, T.Y. and **Hughes-Oliver, J.M.** 2010. Uncertainty Adjustments to Deterministic Atmospheric Dispersion Models. *International Journal of Environment and Pollution*, 42, 85-106.
- Zhang, Q., **Hughes-Oliver, J.M.**, Ng, R.T. 2009. A Model-Based Ensembling Approach for Developing QSARs. *Journal of Chemical Information and Modeling*, 49(8), 1857-1865.
- **Hughes-Oliver, J.M.**, Heo, T.Y. and Ghosh, S.K. 2009. An autoregressive point source model for spatial processes. *Environmetrics*, 20(5), 575-594.
- Liu, J., **Hughes-Oliver, J.M.**, and Menius, J.A. 2007. Domain-enhanced analysis of microarray data using GO annotations. *Bioinformatics*, 23, 1225-1234.
- Remlinger, K.S., **Hughes-Oliver, J.M.**, Young, S.S., and Lam, R. 2005. Statistical Design of Pools Using Optimal Coverage and Minimal Collision. *Technometrics*, 48(1), 133-144.
- **Hughes-Oliver, J.M.** Pooling experiments for blood screening and drug discovery. 2006. In *Screening: Methods for Experimentation in Industry, Drug Discovery, and Genetics*, edited by Dean, A.M. and Lewis, S.M. and published by Springer-Verlag New York, Inc. (All chapters in this book were refereed by at least two reviewers.)
- Yi, B., **Hughes-Oliver, J. M.**, Zhu, L., and Young, S. S. 2002. A Factorial Design to Optimize Cell-Based Drug Discovery Analysis. *Journal of Chemical Information and Computer Sciences*, 42, 1221-1229.
- **Hughes-Oliver, J. M.** 2002. Standard error. In *Encyclopedia of Environmetrics*, volume 4, edited by A. H. El-Shaarawi and W. W. Piegorsch, Wiley.
- Zhu, L., **Hughes-Oliver, J. M.**, and Young, S. S. 2001. Statistical decoding of potent pools based on chemical structure. *Biometrics*, 57 (3), 922-930.

- Hughes-Oliver, J. M. and Rosenberger, W. F. 2000. Efficient estimation of the prevalence of multiple rare traits. *Biometrika*, 87 (2), 315-327.
- Boos, D. D. and Hughes-Oliver, J. M. 2000. How large does  $n$  have to be for  $Z$  and  $t$  intervals? *The American Statistician*, 54 (2), 121-128.
- Rosenberger, W. F. and Hughes-Oliver, J. M. 1999. Inference from a sequential design: proof of a conjecture by Ford and Silvey. *Statistics and Probability Letters*, 44 (2), 177-180.
- Su, C., Lu, J. C., Chen, D., and Hughes-Oliver, J. M. 1999. A random coefficient degradation model with random sample size. *Lifetime Data Analysis*, 5 (2), 173-183.
- Lu, J. C., Liu, S., Yin, M., and Hughes-Oliver, J. M. 1999. Modeling restricted bivariate censored lowflow data. *Environmetrics*, 10 (2), 125-136.
- Hughes-Oliver, J. M. and Gonzalez-Farias, G. 1999. Parametric covariance models for shock-induced stochastic processes. *Journal of Statistical Planning and Inference*, 77 (1), 51-72.
- Chen, D., Lu, J. C., Hughes-Oliver, J. M., and Li, C. S. 1998. Asymptotic properties of maximum likelihood estimates for a bivariate exponential distribution and mixed censored data. *Metrika*, 48 (2), 109-125.
- Hughes-Oliver, J. M., Gonzalez-Farias, G., Lu, J. C., and Chen, D. 1998. Parametric nonstationary correlation models. *Statistics and Probability Letters*, 40 (3), 267-278.
- Hughes-Oliver, J. M., Lu, J. C., Davis, J. C., and Gyurcsik, R. S. 1998. Achieving uniformity in a semiconductor fabrication process using spatial modeling. *Journal of the American Statistical Association*, 93 (441 and 443), 36-45 and 1252.
- Boos, D. D. and Hughes-Oliver, J. M. 1998. Applications of Basu's theorem. *The American Statistician*, 52 (3), 218-221.
- Hughes-Oliver, J. M. 1998. Optimal designs for nonlinear models with correlated errors. In *Lecture Notes-- Monograph Series Volume 34: New Developments and Applications in Experimental Design*, edited by N. Flournoy, W.F. Rosenberger, and W.K. Wong, 163-174. Hayward.
- Davis, J. C., Hughes-Oliver, J. M., Lu, J. C., and Gyurcsik, R. S. 1996. Improved within-wafer uniformity modeling through the use of maximum likelihood estimation of the mean and covariance surfaces. *Journal of the Electrochemical Society*, 143 (10 and 12), 3404-3409 and 4129.
- Davis, J. C., Gyurcsik, R. S., Lu, J. C., and Hughes-Oliver, J. M. 1996. A robust metric for measuring within-wafer uniformity. *IEEE Transactions on Components, Packaging, and Manufacturing Technology—Part C*, 19, 283-289.
- Hughes-Oliver, J. M. and Swallow, W. H. 1994. A two-stage adaptive group-testing procedure for estimating small proportions. *Journal of the American Statistical Association*, 89 (427), 982--993.
- Brownie, C., Boos, D. D., and Hughes-Oliver, J. 1993. A note on the operating characteristics of the modified F-test---Response. *Biometrics*, 49 (3), 939--939.
- Brownie, C., Boos, D. D., and Hughes-Oliver, J. 1990. Modifying the  $t$  and ANOVA  $F$  tests when treatment is expected to increase variability relative to controls. *Biometrics*, 46 (1), 259--266.

#### Patent Application

- Hughes-Oliver, J.M., Young, S.S., Zhang, K., and Brooks, A.D. 2005. Optimal Bit String Recursive Partitioning Tree (OBSTree). Filed June 2005.

#### Proceedings Articles (no overlap with Refereed Articles)

- Yi, B., Hughes-Oliver, J. M., Young, S. S., and Zhu, L. 2001. Latent class regression analysis on the potency of chemical compounds and comparison to recursive partitioning. Proceedings of the 2001 Joint Statistical Meetings.

- Hahn, W. P., Hughes-Oliver, J. M., and Swallow, W. H. 1996. Robustness of group testing in the estimation of proportions. Proceedings of the 1996 Joint Statistical Meetings.

Technical Reports (no overlap with Refereed Articles or Non-refereed Book Chapters or Proceedings Articles)

- Hughes-Oliver, J.M., Heo, T.Y., and McDonald, S. 2008. A Spatial Editing and Validation Process For Short Count Traffic Data. NCDOT Project Authorization Number HWY-2002-09. Final Report. To appear in Transportation Research Board as FHWA/NC/2006-59.
- Hughes-Oliver, J.M., Heo, T.Y., and McDonald, S. 2008. Research Digest: A Spatial Editing and Validation Process For Short Count Traffic Data. NCDOT website.
- Peraza-Garay, F., Gonzalez-Farias, G., and Hughes-Oliver, J. M. 2001. Bayesian modeling of the effect of point sources. CIMAT Technical Report Series.
- Langfeldt, S. A., Hughes-Oliver, J. M., Ghosh, S. K., and Young, S. 1997. Optimal group testing in the presence of blockers. Institute of Statistics Mimeo Series No. 2297.
- Hughes-Oliver, J. M. Characterizing the behavior of some boxplot rules for outlier detection. 1996. Institute of Statistics Mimeo Series No. 2282.
- Hughes-Oliver, J. M. and Swallow, W. H. Choosing the group size for group testing to estimate a proportion. 1992. Institute of Statistics Mimeo Series No. 2209.
- Marshall, P. and Hughes-Oliver, J. M. Teachers and diverse students: A different look at teaching concerns.
- Hughes-Oliver, J. M. and Piegorsch, W. W. Bayesian hypothesis testing for umbrella alternatives, with applications to genotoxicity assays.

Service

- StatFest Committee. 2004. StatFest @ NC State is a Huge Success! *Amstat News*, Committee News, January, 9-10.
- Hughes-Oliver, J. M. 2001. Integrating into ASA: Becoming an Active Member. *Amstat News*, Career Corner, January, 25-26.
- Hughes-Oliver, J. M. 2001. SIE at JSM 2001, A Delightful Dish! *Amstat News*, Section News, March, 35--36.
- Hughes-Oliver, J. M. 2001. SIE 2001 Student Paper Competition. Papers due June 1. *Amstat News*, Section News, March, 36.
- Hughes-Oliver, J. M. 2001. Have an Idea for an SIE Invited Session? Travel Funds are Available! *Amstat News*, Section News, March, 36.

## Presentations

Invited Talks

- "Areas of Difficulty and Success: How Faculty and Graduate Students Have Navigated the Graduate Experience and Mentoring Relationship". Workshop on Mentoring Doctoral Students, NC State University, College of Sciences. April 28, 2015
- "Journey to Infinity" talk at the 2015 Infinite Possibilities Conference (IPC). Oregon State University, Corvallis, OR. March 2, 2015
- A Statistician's Tour of Duty in the World of Drug Discovery. NC State University, College of Sciences, Faculty-In-Action Seminar Series. January 28, 2015
- Mining in the Presence of Class Imbalance: Precision-Recall Curves and the F-Measure. Award Lecture at the IPAM Special Event: "Blackwell-Tapia Conference 2014" (November 14-15, 2014). Los Angeles, CA
- [Topic Contributed Session] Standing on the Shoulders of Giants: A Minority Perspective. 2014 JSM, July 2014, Boston, MA

- Mining in the Presence of Class Imbalance: Precision-Recall Curves and the F-Measure. Invited Speaker in the session titled "Modern Data Mining" at the 30<sup>th</sup> Quality and Productivity Research Conference (QPRC 2013) held at GE Global Research, Niskayuna, NY on June 4-7<sup>th</sup>, 2013
- Analysis of High-Dimensional Structure-Activity Screening Datasets Using the Optimal Bit String Tree. Seminar Series, Department of Mathematics and Statistics, Georgetown University (April 12, 2013), Washington DC.
- A Statistician's Tour of Duty in the World of Drug Discovery. Joaquin Bustoz, Jr. Lecture at the ICERM Special Event: "Blackwell-Tapia Conference 2012" (November 9-10, 2012). Providence, RI
- Success is a Journey, not a Destination. Keynote Address at the JSM Diversity Workshop and Mentoring Program 2012 (July 29, 2012), San Diego, CA
- Gene Expression Data Analysis Using the Gene Ontology. Department of Statistics, George Mason University. Fairfax, Virginia. January 2010.
- A Statistician's Tour of Duty in the World of Drug Discovery. Department of Statistics, George Mason University. Fairfax, Virginia. July 2009.
- ChemModLab: QSAR modeling and model-based searching. 2009 Spring Research Conference on Statistics in Industry and Technology. May 2009. Vancouver, Canada.
- Analysis of High-Dimensional Structure-Activity Screening Datasets Using the Optimal Bit String Tree. Blackwell-Tapia Conference. November 2008.
- ChemModLab: QSAR modeling and model-based searching. NCSU Department of Statistics. November 2008.
- Properties of Ensemble Models for Supervised Learning. American Chemical Society (ACS) Meetings. New Orleans, Louisiana. April 2008.
- ChemModLab: QSAR Modeling and Model-Based Searching. Department of Statistics, George Mason University. Fairfax, Virginia. April 2008.
- ChemModLab: QSAR Modeling and Model-Based Searching. Department of Statistics, University of Iowa. Iowa City, Iowa. January 2008.
- Pathway-Based Analysis of Metabolic Profiles. Eastern North American Region of the International Biometrics Society (ENAR). Atlanta, Georgia. March 2007.
- Future Directions for Non-Negative Matrix Factorization. Panel presenter. Joint NISS-ECCR@NCSU Workshop on Non-negative Matrix Factorization. RTP, North Carolina. February 2007.
- Analysis of High-Dimensional Structure-Activity Screening Datasets Using the Optimal Bit String Tree. Department of Statistics, Texas A&M University. College Station, Texas. February 2007.
- ChemModLab and Measures of Assessment for QSAR Models. Workshop of the Exploratory Center for Cheminformatics Research at North Carolina State University (ECCR @ NCSU). Raleigh, North Carolina. November 2006.
- Analysis of High-Dimensional Structure-Activity Screening Datasets Using the Optimal Bit String Tree. Department of Statistics, University of Michigan. Ann Arbor, Michigan. October 2006.
- Pathway-Based Analysis of Metabolic Profiles. Metabolon (a biotechnology research company). RTP, North Carolina. September 2006.
- Design Issues in Drug Discovery: Forming Pools Using Optimal Coverage and Minimal Collision. International Society For Business And Industrial Statistics (ISBIS) Conference 2006. Lima, Peru. January 2006.
- Design Issues in Drug Discovery: Forming Pools Using Optimal Coverage and Minimal Collision. Design and Analysis of Experiments (DAE) Conference 2005. Santa Fe, New Mexico. October 2005.
- Statistical Adjustments to Air Dispersion Modeling for Determining the Effect of a Point Source. Hyderabad, India. December 2004.

- Pooling for Detection of Synergistic Compounds. Joint Statistical Meetings. Toronto, Canada. August 11, 2004.
- Twins and high dimensional data: can leave-one-out cross validation survive? International Federation of Classification Societies (IFCS). Chicago, Illinois. July 18, 2004.
- Statistical Adjustments to Air Dispersion Modeling for Determining the Effect of a Point Source. Spring Research Conference on Statistics in Industry and Technology. May 2004.
- Pooling Experiments for High Throughput Screening in Drug Discovery. Quality and Productivity Research Conference. May 2004.
- Twins and high dimensional data: can leave-one-out cross validation survive? SAMSI Closing Workshop for Data-Mining and Machine Learning. May 2004.
- Are mixture/pooling experiments worthwhile for drug discovery? Gordon Research Conference on Statistics in Chemistry and Chemical Engineering. August 2003.
- Pooling experiments for high throughput screening in drug discovery. Spring Research Conference on Statistics in Industry and Technology. June 2003.
- Pooling experiments for high throughput screening in drug discovery. Department of Statistics, Purdue University. West Lafayette, Indiana. October 2002.
- Pooling experiments for high throughput screening in drug discovery. NISS Affiliates Technology Day: Statistical Aspects of High Throughput Screening. Research Triangle Park, NC. October 2002.
- Pooling 101. GlaxoSmithKline Drug Discovery Data (3D) Workshop, Vancouver, Canada, July 2002.
- Integrating into ASA: Becoming an Active Member. August 2000, Joint Statistical Meetings, Indianapolis, IN.
- Overview of spatial statistics. Department of Computer Graphics, SAS, June 22, 1999.
- Spatial analysis of a semiconductor deposition process. Department of Statistics, Rice University, April 5, 1999.
- Efficient estimation of the prevalences of multiple rare traits. Mathematisches Forschungsinstitut Oberwolfach, Germany, November 1998.
- Parametric covariance models for shock-induced stochastic processes II. Department of Statistics, North Carolina State University, November 1998.
- Parametric covariance models for shock-induced stochastic processes I. National Institute of Statistical Sciences. Research Triangle Park, March 1998.
- Curvature adjusted optimal designs for nonlinear models with correlated errors. AMS-IMS-SIAM Summer Research Conference on New Developments and Applications in Experimental Designs. Seattle, Washington, June-July 1997.
- Adaptive estimation of the prevalence of a rare trait. University of North Carolina at Chapel Hill, December 1996.
- Achieving uniformity in a semi-conductor fabrication process using spatial modeling II.
  - CIMAT, Mexico, July 1996.
  - University of Baltimore—Maryland County, October 1996.
  - University of Virginia, November 1996.
  - Temple University, March 1997.
- Achieving uniformity in a semi-conductor fabrication process using spatial modeling I.
  - Interface'95, June 1995.
  - Stanford University, June 1996.
- The underrepresentation of women in academia: Identifying the issues. Crosstalk Colloquium Series of The Graduate School, North Carolina State University, Fall 1995.



- Robust improvement of a semiconductor fabrication process via spatial modeling of the mean and covariance surfaces. Fall Technical Conference, Birmingham, AL, October 1994.
- Curvature adjusted optimal nonlinear models for correlated responses. American Statistical Association Annual Meeting, Toronto, Canada, August 1994.
- Robust improvement of a semiconductor fabrication process via spatial modeling of the mean and covariance surfaces. Institute of Mathematical Statistics Spring Research Conference, Chapel Hill, NC, June 1994.
- Characterizing boxplot rules for outlier detection. Ohio State University, October 1993.
- An adaptive group-testing procedure for estimating proportions. University of Cincinnati, March 1993.
- Estimation using group-testing procedures: adaptive iteration. University of Wisconsin at Madison, September 1991.

*Invited Posters*

- Parametric covariance models for shock-induced stochastic processes. 50<sup>th</sup> Anniversary of the Department of Statistics at Iowa State University Conference, Ames, IA, October 1997.

*Contributed Talks*

- Mining in the Presence of Class Imbalance: Precision-Recall Curves and the F-Measure. 2013 Nonclinical Biostatistics Conference (NCB2013). Villanova University, PA. October 15-17, 2013.
- Pooling experiments for high-throughput screening in drug discovery. Joint Statistical Meetings. Topic Contributed session. August 2003.
- Bayesian hypothesis testing for umbrella alternatives, with applications to genotoxicity assays. March 1990, Spring ENAR Meetings of The Biometric Society, Baltimore, MD.

*Contributed Poster*

- Parametric nonstationary correlation models. Modelling Longitudinal and Spatially Correlated Data: Methods, Applications, and Future Directions, Nantucket, MA, October 1996.

**Courses Taught**

- Applied Least Squares
- Applied Statistics
- Applied Nonlinear and Generalized Linear Regression Models
- Experimental Statistics for the Biological Sciences I
- General Statistics Tutorial for undergraduate and graduate students
- Introduction to Mathematical Statistics I
- Introduction to Mathematical Statistics II
- Introduction to Probability and Distribution Theory
- Introduction to Regression Analysis
- Probability & Statistics for the Physical Sciences
- Special Topics in Statistics (Independent Study with Honors students)
- Statistical Learning
- Statistical Quality Control and Productivity Improvement
- Statistical Theory I
- Statistical Theory II
- Statistics for Geneticists, a module in the Institute of Statistical Genetics
- Summer Institute for Training in Biostatistics, SIBS at NC State

### Doctoral Students Directed

- Cheng Su. (Co-chair was J. C. Lu.) Graduated December, 1996.
- William P. Hahn. (Co-chair was W. H. Swallow.) Graduated August, 1997.
- Leah Martell. (Co-chair was J. C. Lu.) Graduated 2000.
- Lei Zhu. Graduated August, 2000.
- David Wilson. (Co-chair was D. D. Boos.) Graduated December, 2002.
- Bingming Yi. (Co-chair was S. S. Young.) Graduated May, 2003.
- Katja Remlinger. (Co-chair was S. S. Young.) Graduated July, 2004.
- Tae-Young Heo. Graduated August, 2005.
- Ke Zhang. Graduated May, 2006.
- Jiajun Liu. (Co-chair was Jason Osborne.) Graduated August, 2007.
- Amy Nail. (Co-chair was John Monahan.) Graduated December, 2007.
- Yuhua Su. (Co-chair was Jason Osborne.) Graduated 2011.
- Jeremy Ash. Bioinformatics. Expected graduation 2019.

### Department and University Service

#### Department

- Post-Tenure Review Committee. 2017-2020
- Chair of the TAP Search Committee, Fall 2017
- PhD Advancement Committee, August 2017
- Chair of the Qualifying Exam Committee, Summer 2017
- Member of the 75<sup>th</sup> Anniversary Conference Committee. 2016
- Member of the January 2016 PhD Qualifier Exam Committee
- Member of the August 2015 PhD Advancement Committee
- Chair of the August 2015 PhD Qualifier Exam Committee
- Chaired Committee on Peer-Teaching Evaluation & Mentoring. September 2014 – April 2015
  - Developed guidelines for peer evaluation of teaching
  - Developed guidelines for mentoring junior faculty in teaching
- Member of the Department Search Committee. September 2014 – February 2015. (Resulted in 2 new hires)
- Department Representative: Master's Degree & Certificate Program – Data Analytics Engineering. 2012 – April 2014
- Departmental Tenure Review Committee. 2011 – 2013
- Qualifying Exam Committee (Applied Statistics): Spring 2012, Fall 2012 (Chair), Spring 2013 (Chair), Fall 2013 (Chair), Spring 2014
- Search Committee (Tenure-track), 2011—2012
- D.D. Mason Faculty Award Selection Committee, 2010
- Led workgroup of students where the goal was to improve retention among first-year graduate students. Spring 2009
- Co-Director of Graduate Programs, with primary responsibility for admission and support decisions, 2007—2010
- Departmental reviewer and evaluator of FLE presentation videos - assess English skills, Fall 2007—2010
- Graduate Admissions Committee, Chair, Summer 2007—2010
- Course & Curriculum Committee, Fall 2007—2010
- Cox Fellowship Committee, 2008—2011
- Basic Exam Committee: Jan 2009, Jan 2010, Jan 2011

- Search Committee, 2008—2009
- Presenter at the 2007 Infinite Possibilities Conference (IPC). Raleigh, North Carolina. November 2007
- Participant in the Visit NC State Day program (designed to attract under-represented minorities to attend graduate school at NC State University). 2008, 2009
- D.D. Mason Faculty Award Selection Committee, 2007—2008
- Seminar Committee (Chair), July 2006-June 2007
- PhD Preliminary Written Exam Committee, Summer & Fall 2006
- Search Committee, Fall 2005—Spring 2006.
- PhD Preliminary Written Exam Committee, Summer & Fall 2005
- Diversity Oversight Director for VIGRE II, Fall 2004—2009
- Teaching Professor Promotion Committee, May 2004—2007
- StatFest Conference Committee (Chair), Fall 2003.
- Department Masters' Exam Committee. Fall 2002, Spring 2003 (Chair), Fall 2003, Spring 2004.
- Nomination Committee for Head of the Department of Statistics. 2001—2002.
- Department Ph.D. Qualifying Exam Committee. Spring 2002.
- Chair of Department Masters' Exam Committee (first time for the new format): Fall 2001.
- Admissions Committee, 2000—2003.
- Comprehensive Review Committee. 2000—2003.
- Co-Lead (with Sastry Pantula) for Diversity Initiative, 2000—2002.
- Selection Committee for the Sloan Foundation Awards to Support Graduate Student Family Activities. Fall 2000.
- Chair of Department Basic Exam Committee. Fall 1999.
- Department Assistant Professor Search Committee. 1996—1997.
- Department Head Search Committee. 1993—1994.
- Department Seminar Committee. 1993—1994.
- Department Basic Exam Committee. Spring 1993, Fall 1994, Fall 2000, Spring 2001.
- Recruiting activities:
  - NAM MATHFest XI, October 2001, Florida A&M University, Tallahassee, FL.
  - NAM MATHFest X, October 2000, Morgan State University, Baltimore, MD.
  - Spelman College, February 2001, Atlanta, GA. Also visited Morehouse College and Clark-Atlanta University, both in Atlanta, GA.
  - Participated in the Graduate School's "Visit NC State Day" by hosting 4 students in Spring 2001 and meeting with 3 students in Spring 2002.
  - Participated in a Mentoring Workshop offered through The Graduate School. October 2000, McKimmon Center, Raleigh, NC.

### University

- Faculty Advisory Committee, College of Sciences, 2017-
- "Areas of Difficulty and Success: How Faculty and Graduate Students Have Navigated the Graduate Experience and Mentoring Relationship". Workshop on Mentoring Doctoral Students, NC State University, College of Sciences. April 28, 2015
- A Statistician's Tour of Duty in the World of Drug Discovery. NC State University, College of Sciences, Faculty-In-Action Seminar Series. January 28, 2015
- Volgenau School Promotion and Tenure Committee, 2011—2013

- Keynote speaker for the 2010 Association for the Concerns of African-American Graduate Students (ACAAGS) 27<sup>th</sup> Annual Award Program, 2010
- Committee on Honorary Degrees, 2009—2011
- College of Physical & Mathematical Sciences—Leadership Review Committee, 2009-2010
- College of Physical & Mathematical Sciences—Multicultural Affairs Banquet 2009, Keynote speaker - April 19, 2009
- Campus Culture Task Force Committee, 2008-2009
- Panelist for "Association of Women Faculty - Balancing Life and Work Careers", November 2008
- Invited participant of "Breakfast with the Chancellor", October 2008
- Search Committee, Chair - Director of Multicultural Affairs for the College of Physical & Mathematical Sciences, 2008
- Participant in the Building Future Faculty Program (designed to attract under-represented minorities to take faculty positions at NC State University or other academic institutions). March 2008
- College of Physical & Mathematical Sciences Health Cluster Committee, 2008
- Presentation on directing graduate student research as part of the Assistant Professors' Learning Community (APLC) series. November 2007
- Executive Board of the Academy of Outstanding Teachers. 2006-2007
- Member of the LITRE (Learning in a Technology-Rich Environment) Assessment Committee. 2006-2007
- Speaker for the March 2007 Building Future Faculty program (designed to attract under-represented minorities to take faculty positions at NC State University or other academic institutions)
- Judge for Society of African-American Physical and Mathematical Scientists African-American History Quiz Bowl. February 26, 2005
- Speaker for the Women in Science and Engineering (WISE) Speaker Series. The WISE Village is a living and learning community of female scholars, which is a joint venture of PAMS, Engineering and University Housing. October 13, 2004.
- Delivered keynote address for the 2004 Annual Awards Banquet of the Society of African-American Physical and Mathematical Scientists. April 25, 2004.
- Panelist for "Promotion and Tenure" Panel for the Council on the Status of Women's (CSW) Professional Development Conference (PDC). April 2004
- College of Physical & Mathematical Sciences Meeting Between Administrators and African-American Alumni. Participant and lead for a session. November 19, 2003
- Roundtable discussant on "Being a Woman in Science and Engineering-What can you do" for the Women in Science and Engineering (WISE) Village, a living and learning community of female scholars, which is a joint venture of PAMS, Engineering and University Housing. August 15, 2003
- Executive Board of the Academy of Outstanding Teachers at North Carolina State University. 2003-2006.
- Faculty Senator for the College of Physical & Mathematical Sciences, July 2000—June 2002.
- Personnel & Policy Committee of the Faculty Senate. 2001—2002.
- Faculty Senate Representative to the
  - Computing Standing Committee, 2000-2002.
  - College of Physical & Mathematical Sciences Advisory Council, 2000-2001.
- Member of the Genomics Faculty of North Carolina State University. 1999—2011.
- Member of the Executive Advisory Committee for the Graduate School Minority Graduate Education (MGE) grant. 1999—2001.
- Nomination Committee for Dean of the College of Physical and Mathematical Sciences, 1999—2000.
- Panel speaker for the 1999 New Student Orientation. June 6, 1999.

- College of Physical and Mathematical Sciences Search Committee for Director of the Imhotep Academy. 1998.
- College of Physical and Mathematical Sciences Teaching Awards Committee. 1996—2000.
- Provost's Ad Hoc Committee. 1993.
- Martin Luther King, Jr. Festival Committee. 1993-1997.

### Professional Societies

- The American Statistical Association
- The Biometric Society

### Professional Service

- Faculty Facilitator for the National Alliance for Doctoral Studies in the Mathematical Sciences' F-GAP program. March 2016 –
- EPA Science Advisory Board's Chemical Assessment Advisory Committee (EPA-SAB-CAAC). November 2015 – September 2018
- Program Co-Chair for the Southern Regional Council on Statistics (SRCOS) 2016 Summer Research Conference. November 2015 – June 2016
- National Blackwell-Tapia Committee. October 2015 –
- "Journey to Infinity" talk at the 2015 Infinite Possibilities Conference (IPC). Oregon State University, Corvallis, OR. March 2, 2015
- [Topic Contributed Session] Standing on the Shoulders of Giants: A Minority Perspective. 2014 JSM, July 2014, Boston, MA
- Keynote speaker for the 2012 JSM Diversity Program and Mentoring Workshop, San Diego, CA, Aug 2012
- NSF Reviewer of Submitted Grants, 2012
- Panelist for the Infinite Possibilities Conference, March 2012
- NIH Biostatistical Methods and Research Design (BMRD) Study Section, July 2009 to June 2012.
- American Statistical Association Committee on Fellows, 2009-2011
- Keynote speaker for StatFest 2010, Spelman College 2010
- 2010 Cavell Brownie Scholars Program, Speaker and Committee Member, Joint Statistical Meetings 2010
- Panelist for the Iowa Field of Dreams and StatFest Conferences, 2009
- American Mathematical Society, Committee on Programs that Make a Difference, 2009
- Invited guest reviewer on NIH's BMRD study section, October 2008
- Took three graduate students to the 2008 Institute on Teaching and Mentoring Conference – The Compact for Faculty Diversity, 2008
- Attended MSRI's Promoting Diversity at the Graduate Level in Mathematics: a National Forum, 2008
- Keynote speaker for 2008 Martin Luther King Celebration at University of Iowa, 2008
- Program Chair for Chemometrics subcommittee of ASA's Section on Physical and Engineering Sciences. 2004-2008.
- Organized SPES-Chemometrics Topic Contributed paper sessions for the 2007 Joint Statistical Meetings that were held in Salt Lake City, Utah (July-August 2007)
- Organized the SPES-Chemometrics Invited paper session for the 2006 Joint Statistical Meetings that were held in Seattle, Washington (August 2006)
- Organized an IMS Invited paper session on metabolomics for the 2007 ENAR Conference that was held in Atlanta, Georgia (March 2007)
- Human Resources Advisory Committee of the Mathematical Sciences Research Institute. 2004-2007

- Presentation on forming professional collaborations. Infinite Possibilities Conference. Raleigh, North Carolina. November 2007
- Participated in the Fred A. Olds University Connections Magnet Program. This public school gained its magnet status from an official inter-institutional agreement with North Carolina State University. 2006-2007
- Presenter at the 2007 Career Fair for Ligon Middle School
- Organized an Invited paper session, titled "Statistical issues in high throughput chemistry," for the 2005 Joint Statistical Meetings to be held in Minneapolis, Minnesota
- External reviewer for a doctoral defense at the University of Waterloo
- Keynote speaker for the Diversity Workshop at the 2005 ENAR Meetings in Austin, Texas. March 20, 2005
- Organized Invited session "Chemometrics" for the Joint Statistical Meetings, 2004, Toronto, Canada.
- Panel speaker at the "Educators Across America" Conference. April 2004.
- Lecturer for the University Connections Program with Fred A. Olds Elementary School. Spring 2004.
- Member of the Local Development Committee of the Statistical and Applied Mathematical Sciences Institute. 2000—2003.
- Member of the Regional Advisory Board of the Eastern North American Region of the International Biometric Society. 2000—2002.
- Member of the American Statistical Association's Panel on Elections, formed to study and provide a statistical report on election practices in the US. 2000—2002.
- Facilitated an Invited Panel at JSM 2000, titled "Educating Disadvantaged Children: Past Lessons and Future Directions."
- Publications Officer of the American Statistical Association's Section on Statistics in Epidemiology. 2000—2001.
- Participated in "Educating the Science and Engineering Workforce in Collaboration with Women's and Gender Studies Programs: A North Carolina State University Initiative." This involved seminars on incorporating issues of gender and race into course curricula. 2000.
- Vice Chair of the Committee on Minorities in Statistics of the American Statistical Association. 1999—2003.
- Organized the Invited paper session "Biostatistics and Law II" for the 1999 ENAR Spring Meetings, held March 28—31, 1999 in Atlanta.
- Panel speaker for the 1999 Expanding Your Horizons in Science, Mathematics and Engineering conference. March 9, 1999.
- Secretary of the Section on Statistics and the Environment of the American Statistical Association. 1999.
- Treasurer of the Section on Statistics and the Environment of the American Statistical Association. 1998.
- Appointed Member of the Committee on Minorities in Statistics of the American Statistical Association. 1998—2003.
- Chaired the session "Spatio-temporal modelling of environmental data" at the Joint Statistical Meetings, Dallas, TX, August 9--13, 1998.
- Organized and chaired an Invited paper session at the 1997 Joint Statistical Meetings in Anaheim, California. The session was titled "Spatial-temporal modeling of nonstationary processes: A look ahead."
- Judge at the 6<sup>th</sup> Annual Mathematics and Computer Science Symposium at Norfolk State University, Virginia. April 1997.
- Assisted General Electric--Mebane in establishing their Six Sigma quality initiative. 1995--1996.
- Presentation to the students of the Enloe High School Pre-College Program, October 1995.
- Two presentations to the Undesignated majors at North Carolina State University. Spring 1995.
- Presentation of "The Underrepresentation of Women in Academia: Identifying the Issues" in the Graduate School's Crosstalk Colloquium Series. Fall 1995.

- Presentations at several recruiting activities held on campus by the College of Physical and Mathematical Sciences at North Carolina State University.
- Panelist for North Carolina State University Graduate School Colloquium entitled "The Role and Nature of Doctoral Research and Dissertation at NCSU." April 12, 1990.
- Mentor and host support activities for African-American students studying statistics at North Carolina State University. Spring 1987 to 2011.
- Editorial Service:
  - Editorial Board of *Chemometrics and Intelligent Laboratory Systems*. 2006--2009
  - Associate Editor of *Journal of the American Statistical Association, Applications and Case Studies*. 2004—2006
  - Reviewer of NSF proposals
  - Reviewer of NIH proposals
  - Referee for *American Journal of Human Genetics, American Statistician, Biometrics, Biometrika, Chemical Reviews, Environmetrics, IEEE Transactions on Semiconductor Manufacturing, Journal of the American Statistical Association, Journal of Chemical Information & Computer Sciences, Journal of Chemical Information and Modeling, Journal of Statistical Planning & Inference, Metrika, Statistics & Probability Letters*.

### Honors and Awards

- 2014 Blackwell-Tapia Prize
- Named 2010 University Diversity Award to a Faculty Member
- Named 2010 Outstanding Service Award for Extension, Engagement, and Economic Development
- Named 2007 Fellow of the American Statistical Association
- D. D. Mason Faculty Award for 2005-2006. Citation reads "This award is made in recognition of Professor Hughes-Oliver's years of excellent service in the department in various areas, including outstanding teaching, active participation in enhancing diversity on campus, service with perfection and care on departmental, university and professional committees, mentoring students and being a role model to young statisticians."
- The American Statistical Association's 2006 Statistics in Chemistry Award for the paper "Remlinger, K.S., Hughes-Oliver, J.M., Young, S.S., and Lam, R. 2005. Statistical Design of Pools Using Optimal Coverage and Minimal Collision. *Technometrics*, 48(1), 133-144." Quoting our award notification, "The Committee felt that this paper was an easy-to-understand, yet effective, approach for [high-throughput screening]. They believe that this method will likely be a popular addition to the set of tools for chemometricians to use."
- North Carolina State University College of Physical and Mathematical Sciences recipient of the Board of Governors' Award for Excellence in Teaching. 2003—2004.
- Named Alumni Distinguished Undergraduate Professor for the years 2001—2003, and will retain the title for the remainder of my time at NC State University.
- Invited to participate in the international workshop "Experimental Design: Theory and Applications" at the Oberwolfach Institute in Germany. November 1998.
- Selected to participate in the Young Researchers Poster Session at the Correlated Data Conference held at Iowa State University in October, 1997.
- 1996 elected to the NCSU Academy of Outstanding Teachers.
- 1995—1996 Outstanding Teacher Award.
- Recipient of 3-year National Science Foundation Fellowship for graduate studies (1986--1989).
- Recipient of a Cox Fellowship for graduate study in Statistics (1986--1989).
- Recipient of a Graduate School Fellowship (1990).

- Recipient of a Student Travel Award and a Student Prize for paper presented at the 1990 E.N.A.R. Spring Meetings.
- Phi Beta Kappa (since 1986).
- Department of Statistics Master's Student of the Year (1987).
- African-American Graduate Student of the Year at NCSU (1987--1988).
- African-American Graduate Student of the Year in the College of Physical and Mathematical Sciences (1987-1988, 1989-1990, 1990-1991).
- Statistics Student of the Year (1984-1985).
- Alpha Lambda Delta (Freshman Honorary Society).