Abhishek Kaul
Biostatistics and Computational Biology,
National Institute of Environmental Health Sciences,
111 T.W. Alexander Dr., RTP, NC-27709.
Phone: 517 775 6113, Email: abhishek.kaul@nih.gov
Website: http://www.niehs.nih.gov/research/atniehs/labs/bb/staff/kaul/index.cfm

Education

- Ph.D. Statistics.
  Michigan State University, East Lansing, MI, USA
  Sep. 2010 - May 2015.
  Thesis Advisor : Professor Hira L. Koul
  High Dimensional Regression Models Under Long Memory Dependence & Measurement Error.
- B.Sc. (Honors) Mathematics
  University of Delhi, New Delhi, India
  July 2006 - June 2009.

Academic Appointments

Current appointment: Research Fellow: (Aug. 2015- Present)

- Biostatistics and Computational Biology Branch
  National Institute of Environmental Health Sciences (NIEHS), Research Triangle Park, NC, USA.

Statistical Consultant : (Aug. 2014- May 2015)

- Consultant at Center for Statistical Training and Consulting (CSTAT),
  Michigan State University.

Teaching Experience

Graduate Teaching Assistant

- Statistical Methods (STT 200)
  Fall (2010, 2011), Spring (2011)
- Introductory Probability and Statistics for Business (STT 315)
  Fall (2012), Spring (2012, 2013)

Instructor

- Statistical Methods (STT 200)
  Summer (2011, 2012)
- Introductory Probability and Statistics for Business (STT 315)
  Summer (2013, 2014)

Workshop Instructor

- Introduction to statistics and experimental design (Jan-2016)
  National Institute of Environmental Health Sciences.
  RTP, NC.
- Introduction to hypotheses testing (Jun-2016)
  National Institute of Environmental Health Sciences. RTP, NC.

Research Interests

- **Big data/ high dimensional data**: I develop methods for covariate selection, estimation and inference in high dimensional linear and generalized linear models with special focus on analyses of data which are observed with missing values, measurement error or have persistent dependence within observations.
- **Microbiome data**: I also develop methodology for estimation and inference on parameters for models meant for the analysis of human microbiome data. This data requires special attention to the inherent missing mechanism. Machine learning of classification and clustering are also implemented.

Consulting Experience

Center for Statistical Training and Consulting (CSTAT), Michigan State University.

- Assisted graduate students and faculty from different disciplines (Engineering, Social Sciences, Communication Arts and Sciences, Epidemiology) in understanding and resolving their statistical issues
- Projects included problems in

Linear and nonlinear regression	Meta-Analysis	Generalized linear models
Survival Methods	Linear mixed models	Design of Experiments
Dose-response models		

Computing Experience

Statistical Packages

- R- Advanced programming skills with more than 4 years of experience
- SAS, MATLAB, SPSS and Minitab – Implemented as per necessity.

Published manuscripts

1. **Lasso with Long Memory Regression Errors,** (2014)
   Journal of Statistical Planning and Inference
   http://www.sciencedirect.com/science/article/pii/S0378375814000779
2. **Weighted l_1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models,** (2015) with Hira L. Koul
   Journal of Multivariate Analysis
   http://www.sciencedirect.com/science/article/pii/S0047259X1500113X

Manuscripts under revision

3. **Structural Zeros in High Dimensional Data with Applications to Microbial Studies,** with Ori Davidov and Shyamal Peddada.
   Revision invited: Biostatistics
   http://arxiv.org/abs/1605.06193
4. **Analysis of Composition of Microbiomes (ANCOM) – II: Comparison of Relative Abundances in the Presence of Structural Zeros,** with Siddhartha Mandal, Ori Davidov and Shyamal Peddada.
   Revision invited: Microbiome
   R code for implementation available at:
   http://www.niehs.nih.gov/research/resources/software/biostatistics/ancom_comparison/index.cfm/

Submitted manuscripts

5. **Two Stage Non-penalized Corrected Least Squares for High Dimensional Linear Models with Measurement Error or Missing Covariates,** with Hira Koul, Akshita Chawla and Soumendra Lahiri
   Submitted: Statistica Sinica
   http://arxiv.org/abs/1605.03154

Manuscripts under preparation

6. **Inference in High Dimensional Linear Models with Measurement Error or Missing Covariates,** with Alexandre Belloni, Victor Chernozhukov, and Alexandre Tsybakov, Mathieu Rosenbaum.
7. **Inference on Target Parameters in High Dimensional Linear Models with Long Range Dependent Errors.**
8. **Identifying Microbial Interactions with Growth Patterns in Infants,** with Shyamal Peddada.
9. **An Improved Multi-class SVM for Selection and Classification on a k-Simplex and its Applications to Microbiome Data,** with Shuva Gupta and Shyamal Peddada.
10. **MMHD: An R Package for Estimation and Inference in High Dimensional Linear Models with Measurement error or Missing Covariates,** with Alexandre Belloni and Victor Chernozhukov.

Invited Talks

Weighted l_1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models

- **Invited Talk:** IISA Conference (Dec-2015),
  International Indian Statistical Association Conference, Pune-India.

Analysis of High Dimensional Compositional Data Containing Structural Zeros with Applications to Microbiome Data

- **Invited Talk:** ENAR (Mar-2016),
  Eastern North American Region Conference, Austin-TX.
- **Invited Talk:** NIEHS (Feb-2016).
  National Institute of Environmental Health Sciences.

Two Stage Non-penalized Corrected Least Squares for High Dimensional Linear Models with Measurement error or Missing Covariates

- **Invited Talk:** JSM (Aug-2016),
  Joint Statistical Meeting, Chicago-IL.
- **Invited Talk:** IISA (Aug-2016),
  International Indian Statistical Association Conference, Corvallis-OR.

Contributed Talks & Presentations

Analysis of composition of microbiomes (ANCOM) – II: Comparison of relative abundances in the presence of structural zeros

- **Contributed Poster: Genomics Day** (May-2016)
  National Institute of Environmental Health Sciences

Lasso with Long Memory Regression Errors

- Contributed Poster : Statistics in Application Forum (2013),
  Department of Statistics and Probability,
  Michigan State University.
- Contributed Poster : Midwest Statistics Research Colloquium 2014,
  Department of Statistics,
  University of Chicago.
- Contributed Talk : Joint Statistical Meeting (JSM 2014),
  Boston.

Weighted l_1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models

- Contributed Poster : Statistics in Application Forum (2014),
  Department of Statistics and Probability,
  Michigan State University.
- Contributed Talk : ENAR Meeting (2015),
  Miami.

Student Seminar Presentations

- November (2011), March, September (2012), January (2013), October (2014).
  Department of Statistics and Probability,
  Michigan State University.

Awards

- Travel Award, (2014), Midwest Statistical symposium,
  University of Chicago.
- Graduate School Dissertation Continuation Fellowship (Spring, 2014),
  Michigan State University.
- Travel Fellowship, (2014), Michigan State University.
- Graduate School Dissertation Completion Fellowship (Summer, 2015),
  Michigan State University.

Services and Affiliations	• **Manuscript Review** Statistica Sinica Electronic Journal of Statistics Statistics & Probability Letters Journal of Statistical Planning and Inference Plos One • **Affiliations** Member of American Statistical Association (ASA) Member of International Indian Statistical Association (IISA) Member of Institute of Mathematical Statistics (IMS) Member of Eastern North American Region International Biometric Society (ENAR)