Abhishek Kaul

Contact Information

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Research Interests

Statistical methods for inference in High dimensional models, Change point models, Machine Learning, Empirical Processes, Random Walks.

Education

- Ph.D. Statistics,

  Michigan State University, East Lansing, Michigan, USA
  August 2010-May 2015.

- B.Sc. (Honors) Mathematics,

  University of Delhi, New Delhi, India
  July 2006 - June 2009.

Academic Appointments

Assistant Professor (Tenure track) **August, 2017 - Present**

- Department of Mathematics and Statistics,
  Washington State University, Pullman, WA, USA.

Research Fellow **August, 2015 - August, 2017**

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

Graduate Teaching and Research Assistant **August, 2010- August, 2014**

- Department of Statistics and Probability,
  Michigan State University, East Lansing, MI, USA.

Publications

1 An efficient two step algorithm for high dimensional change point regression models without grid search, (2019), with Venkata K. Jandhyala and Stergios B. Fotopoulos. *Journal of Machine Learning Research.*

2 Household composition and the infant fecal microbiome: The INSPIRE study (2019), with several others. *Americal Journal of Physical Anthropology.*

3 Multiple Change Point Models for Time Series (2019), with I.B. Macneill,Venkata K. Jandhyala and Stergios B. Fotopoulos. *Environmetrics.*

4 Structural Zeros in High Dimensional Data with Applications to Microbiome Studies, (2017), with Ori Davidov and Shyamal Peddada. *Biostatistics.*

5 Analysis of Microbiome Data in the Presence of Excess Zeros, (2017), with Siddhartha Mandal, Ori Davidov and Shyamal Peddada. *Frontiers in Microbiology.*

6 Weighted ℓ_1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models, (2015), with Hira L. Koul. *Journal of Multivariate Analysis.*

7 Lasso with Long Memory Regression Errors, (2014), *Journal of Statistical Planning and Inference.*

Preprints

1 Inference on the change point in high dimensional time series models, (2020), with Venkata K. Jandhyala, Stergios B. Fotopoulos and Abolfazl Safikhani.
submitted to *Elec. J. of Statistics:* (Sept., 2019), Revision invited (June, 2020), Revision submitted (July, 2020). https://arxiv.org/abs/2007.01888

2 Inference on the Change Point in High Dimensional Dynamic Graphical Models, (2020), with Honjin Zhang and Konstantinos Tsampourakis.
submitted to *Biometrika* (May, 2020). https://arxiv.org/pdf/2005.09711.pdf

3 Pivotal Estimation via Self-Normalization for High Dimensional Linear Models with Errors-in-Variables, (2017) with Alexandre Belloni, Mathieu Rosenbaum.
submitted to *Annals of Statistics* (Sept., 2018), Revision submitted (June, 2019), Second revision invited (Feb, 2020). https://arxiv.org/abs/1708.08353

4 Detection and estimation of parameters in high dimensional multiple change point regression models via ℓ_1/ℓ_0 regularization and discrete optimization, (2019), with Venkata K. Jandhyala and Stergios B. Fotopoulos
https://arxiv.org/abs/1906.04396

5 Confidence Bands for Coefficients in High Dimensional Linear Models with Error-in-Variables (2017), with Alexandre Belloni, Victor Chernozhukov
https://arxiv.org/abs/1703.00469

Invited Talks

Inference on the Change Point in High Dimensional Time Series models. International Symposium on Nonparametric Statistics (ISNPS 2020). (June. 2020).

Inference on the Change Point in High Dimensional Time Series models. 13^{th} International Conference on Computational and Financial Econometrics (CFE 2019). (Dec. 2019).

Two Stage Non-Penalized Corrected Least Squares for High Dimensional Linear Models with Measurement error or Missing Covariates, JSM (Aug-2016).

Weighted l1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models. IISA Conference (Dec-2015)

Analysis of High Dimensional Compositional Data Containing Structural Zeros with Applications to Microbiome Data.
- ENAR conference (Mar-2016).
- National Institute of Environmental Health Sciences, (Feb-2016).

Contributed Talks and Presentations

An efficient two step algorithm for high dimensional change point regression models without grid search. Talk: JSM 2019, Denver, Colorado.

Analysis of composition of microbiomes (ANCOM) II: Comparison of relative abundances in the presence of structural zeros. Poster: Genomics Day (May-2016), National Institute of Environmental Health Sciences.

Weighted ℓ_1-Penalized Corrected Quantile Regression for High Dimensional Measurement Error Models.
- Poster : Statistics in Application Forum (2014), Department of Statistics and Probability, Michigan State University.
- Talk : ENAR Meeting (2015), Miami.

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

Teaching Experience

Course Instruction:

1. Washington State University.
   - Applied Linear Models (STAT 530), Spring 2019.
   - Introduction to Data Analytics (STAT 435), Fall 2018.
   - Statistical Computing (STAT 536), Fall 2017, Fall 2019.
   - Introduction to Multivariate Statistics (STAT 419: in class), Spring 2018, Spring 2019, Fall 2019.
   - Introduction to Multivariate Statistics (STAT 419: online), Fall 2019.
2. Michigan State University.
   - Statistical Methods (STT 200) Summer (2011, 2012)
   - Introductory Probability and Statistics for Business (STT 315) Summer (2013, 2014)

Graduate Teaching Assistant: Michigan State University.

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

Workshop Organizing and Instruction: National Institute of Environmental Health Sciences.

- Introduction to hypotheses testing (Jun-2016)
- Introduction to statistics and experimental design (Jan-2016)

Course Development: Washington State University.

- Introuduction to Data Analytics (STAT 435). (In class version first developed and delivered in Fall 2018, Online version to be developed in Summer 2020).
- Introuduction to Multivariate Statistics (STAT 419). (In class version first developed and delivered in Spring 2018. Online version developed and delivered in Fall 2019).

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

Student Mentoring:

Ph.D. advisor: Zhang, Hongjin. 08/19-Present.

Ph.D. Committee member: Das, Debasmita. 11/17-Present.

MS in Statistics advisor:

1. Lattanzi, Ryan Christopher. Graduated, Spring 2019.
2. Amin, Modhurima Dey. Graduated, Summer, 2020.
3. Tsampourakis, Kostas. Graduated, Summer, 2020.

MS in Statistics committee member:

1. Yuanhong Song. Graduated, Spring 2019.
2. Sarah Ann Morton. Graduated, Summer, 2019.

Journal Reviewer: Annals of Statistics, Journal of the American Statistical Association, Statistica Sinica, Electronic Journal of Statistics, Statistics & Probability Letters, Journal of Statistical Planning and Inference, Journal of Business and Economics Statistics, Journal of Computational and Graphical Statistics, Plos One, Environmetrics, Sankhya.

Departmental Service: Department of Mathematics and Statistics, Washington State University.

1. Graduate coursework restructuring committee. (Fall, 2018).
2. Department Newsletter committee. (Fall, 2017), (Fall, 2018).
3. GQE committee, (Spring, 2018).
4. Graduate Studies committee (Fall, 2019).