Aditya K. Mishra

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Research Interests

Variable selection, multivariate analysis, reduced-rank regression, regularization, singular value decomposition, microbiome data analysis.

Education

Simons Foundation, Flatiron Institute, New York, NY

Flatiron Research Fellow, Sept 2017 - Present

- Objective: *Developing statistical model for analyzing the microbiome data*
- Advisors: Dr. Christian L. Muller

University of Connecticut, Storrs, CT

M.S. and Ph.D., Statistics, Aug 2013 - Aug 2017

- Thesis Topic: *Sequential Estimation of Multivariate Association*
- Advisors: Professor Dipak Dey and Dr. Kun Chen

Indian Institute of Technology, Kharagpur, Kharagpur, India

B.S and M.S., Statistics and Informatics, Jun 2005 - Aug 2010

- Topic: *A study of identification of intron-exon boundary in eukaryotic genes.*
- Advisor: Professor Umesh C Gupta
- Best thesis award

Publications

Mishra, A., Dey, D., Chen, K. (2017) *Sequential Co-Sparse Factor Regression. Journal of Computational and Graphical Statistics, 26(4), 814-825*

Mishra, A., Dey, D., Chen, Y., Chen, K. (2020) *Generalized Co-sparse Factor Regression. To appear in Computational Statistics & Data Analysis*

Mishra, A., Müller, C., (2019) *Robust Regression with Compositional Covariates. arXiv preprint arXiv:1909.04990*

Papers in Preparation

1. **Mishra, A.**, Buja, A., Müller, C. "Negative Binomials Factor Regression Model for Microbiome Data Analysis."
2. **Mishra, A.**, Müller, C., McNichol, J., Blei, D. "Embedding Model for Learning Microbial Associations."
3. Mutshinda, C., **Mishra, A.**, Finkel, Z., Widdicombe, C., Irwin, A. "Using a two-component Bayesian model to decouple the abiotic controls of phytoplankton occurrence and abundance from in situ data."

R Package

Mishra, A., Chen, K. (2017). secure: Sequential Co-Sparse Factor Regression. R package version 0.5. `https://CRAN.R-project.org/package=secure`

Mishra, A., Chen, K. (2020). gofar: Generalized Co-sparse Factor Regression. R package version 0.5. `https://github.com/amishra-stats/gofar`

Mishra, A., Müller, C., (2019). robregcc: Robust Regression with Compositional Covariates. R package version 0.5. `https://cran.r-project.org/package=robregcc`

Mishra, A., Hyun, S., Bien, J., Müller, C., (2019). cmap4r: CMAP for R Users. R package version 0.5. `https://github.com/simonscmap/cmap4r`

Presentations

Invited Talk

- ISI World Statistics Congress, Kuala Lampur, Malaysia — Aug 2019
- WNAR/IMS Annual Meeting, Portland, Oregon — June 2019
- ITMAT Weekly Seminar, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA — June 2019
- CBIOMES Annual Meeting, NYC, NY — May 2019
- New England Statistics Symposium, Hartford, CT — May 2019
- SAMSI Operator Splitting Workshop, NYC, NY — March 2019
- Dept. of Economic Sciences Colloquium at IIT Kanpur, Kanpur, India — Jan 2019
- Dept. of Mathematics & Statistics Colloquium at IIT Kanpur, Kanpur, India — Jan 2019
- National Centre for Biological Sciences Colloquium, Bangalore, India — Jan 2019
- Fall Colloquium Seminars at Columbia Biostatistics, NYC, NY — Sept 2018
- ASA Conference on Statistical Learning and Data Science, NYC, NY — June 2018
- SAMSI Operator Splitting Workshop, Raleigh, NC — March 2018

Contributed Talk

- Virtual Joint Statistical Meeting, ASA — Aug 2020
- CMStatistics Annual Meeting, London, UK — Dec 2019
- CBIOMES Virtual Meeting — Nov 2019
- ASA Joint Statistical Meetings, Denver, CO — July 2019
- Biometric Society (ENAR) Spring Meeting, Philadelphia, PH — March 2019
- CMStatistics Annual Meeting, Pisa, Italy — Dec 2018
- ASA Joint Statistical Meetings, Baltimore, MD — July 2017
- Biometric Society (ENAR) Spring Meeting, Washington, D.C. — March 2017
- International Indian Statistical Association Conference, Pune, India — Dec 2015

Poster

- CBIOMES annual meeting, New York, NY — April 2020
- CBIOMES annual meeting, New York, NY — April 2019
- CBIOMES annual meeting, New York, NY — April 2018
- New England Statistics Symposium, New Haven, CT — April 2016

Workshop

- Strategies and Techniques for Analyzing Microbial Population Structures, Marine Biological Laboratory, Woods Hole, MA — Aug 2018

Professional Experience

University of Connecticut, Department of Statistics, Storrs, CT USA

Consultant, Statistical Consulting Service — **Sept 2015 to May 2017**

- Responsible for providing end-to-end analysis to both internal and external clients. Have completed work on **4** projects.
- Service requires designing statistical analysis, providing computational support using statisttical tools like R, SAS and SPSS, and presenting result of analysis as per client's objective.

Fractal Analytics, Mumbai, India

Data Scientist, Fractal Science — **Nov 2012 to July 2013**

- Developed machine learning algorithm to learn behavioral attribute of product and consumer from transaction data using the concept of finite mixture model. The algorithm was used to develop product named **Customer Genomics**.
- Developed statistical model to predict customer lifetime value in non-contractual setting.

- Developed attribution model in digital marketing to account for incremental impact of different marketing channels leading to sales using the concept of survival analysis.
- Designed **dCrypt** , a self-learning, Natural Language Processing (NLP) algorithm to predict product attribute from its description in CPG domain. The estimated savings of dCrypt is over 15000 analyst hours per annum.

Kavaii, Bangalore, India

Data Scientist **May 2012 to Nov 2012**

- Responsible for developing statistical model to provide predictive analytic solution to client in manufacturing and healthcare sector.

KACST, Riyadh, Saudi Arabia

Research Associate **Dec 2010 to March 2012**

- Developed mathematical model for vocal tract in cases of unvoiced fricatives sound signal and voiced consonant using statistical signal processing.
- Statistical modelling of biological pathway as Bayesian network from high throughput biological data (genetic expression data) using structural learning algorithm.

Awards

Student Awards — University of Connecticut, Department of Statistics
- Pre-Doctoral Fellowship — Summer 2015
- Elizabeth M. McFarlane Fellowship — Summer 2016

Student Awards — University of Connecticut, Graduate School
- Doctoral Dissertation Fellowship — Fall 2016
- Doctoral Student Travel Award for ENAR Spring Meeting 2017 — Spring 2017

Professional Associations

Member, New England Statistical Society (NESS) 2017
Member, American Statistical Association (ASA) 2017
Member, Institute of Mathematical Statistics (IMS) 2019
Member, International Statistical Institute (ISI) 2019

Teaching Experience

Department of Statistics, University of Connecticut

Instructor
- STAT-3375Q-Introduction to Mathematical Statistics I — Fall 2016
- STAT-3445-Introduction to Mathematical Statistics II — Spring 2017
- STAT-1100Q- Elementary Concepts of Statistics — Summer 2016

Teaching Assistant — Fall 2013–Spring 2016
- STAT 1000 - Introduction to Statistics 1
- STAT 1100 - Elementary Concepts of Statistics
- STAT 3375Q - Introduction to Mathematical Statistics I

Workshop
- Statsistical Consulting Service workshop on repeated measure data analysis — May 2016

Service

Referee
- Biometrika
- Journal of Computational and Graphical Statistics
- Sankhya Series B

- Metrika

Flatiron Institute
- Member, Lodestar Curriculum Committee

Technical Skills

Programming: R, Python, C, C++ Applications: TEX, LATEX, BIBTEX Operating Systems: Microsoft Windows, Linux, Mac Last updated: 10/2020