Arindam Chatterjee

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Education

Ph.D. in Statistics, Iowa State University, 2007.

M.Sc. in Statistics, University of Calcutta, 2003.

B.Sc. (Hons.) in Statistics, University of Calcutta, 2001.

Academic Experience

Associate Professor, Stat-Math Unit, Indian Statistical Institute, New Delhi.
04/2018 - present.

Assistant Professor, Stat-Math Unit, Indian Statistical Institute, New Delhi.
07/2010 - 03/2018.

Postdoctoral Fellow, Department of Statistics, Texas A&M University.
09/2007 - 06/2010.

Research Assistant, CSSM, Department of Statistics, Iowa State University.
01/2004 - 07/2006.

Editorial work

01/2019 - Present: Associate Editor, Journal of Statistical Planning and Inference.

01/2019 - 04/2022: Associate Editor, Sankhya, Series A.

Research Interests

High-dimensional statistics, Resampling techniques, Matrix estimation, Time Series, Likelihood based methods, Network data.

Research Papers

1. Das, D., Chatterjee, A. and Lahiri, S. N. (2023). Bootstrapping LASSO estimators under variable selection consistency in high dimensions and some higher order refinements. (Submitted).

2. Chatterjee, A., Bandyopadhyay, T. and Bhattacharya, A. (2023). Inference problems in binary regression model with misclassified response. Accepted in **Journal of Statistical Planning and Inference**.

3. Das, D., Chatterjee, A. and Lahiri, S. N. (2022). Higher Order Accurate Symmetric Bootstrap Confidence Intervals in High Dimensional Penalized Regression. (Submitted).

4. Chatterjee, A. and Bandyopadhyay, T. (2020). Regression models for group testing: Identifiability and asymptotics. **Journal of Statistical Planning and Inference**, 204, 141-152.

5. Chatterjee, A. and Lahiri, S. N. (2018). Edgeworth expansions for a class of spectral density estimators and their applications to interval estimation. **Statistica Sinica**, 28 (4), 2591 - 2608.

6. Chatterjee, A. (2017). Invited comment on the paper "High-dimensional simulatenous inference with the bootstrap.", by R. Dezeure, P. Bühlmann and C.-H. Zhang. **Test**, 26 (4), 729 - 730.

7. Chatterjee, A. and Lahiri, S. N. (2015). Discussion of the paper "An adaptive resampling test for detecting the presence of significant predictors." by I. W. McKeague and M. Qian. **Journal of the American Statistical Association**, 110 (512), 1434 - 1438.

8. Chatterjee, A., Gupta, S. and Lahiri, S. N. (2015). On the residual empirical process based on the Adaptive Lasso in high dimensions and its functional oracle property. **Journal of Econometrics**, 186 (2), 317-324.

9. Chatterjee, A. and Lahiri, S. N. (2013). Rates of convergence of the Adaptive Lasso estimators to the Oracle distribution and higher order refinements by the bootstrap. **Annals of Statistics**, 41 (3), 1232-1259.

10. Chatterjee, A. and Hall, P. (2012). High dimensional classification when useful information comes from many, perhaps all features. **Journal of the Indian Statistical Association**, 50, 51-82.

11. Chatterjee, A. and Lahiri, S. N. (2011). Bootstrapping Lasso estimators. **Journal of the American Statistical Association**, 106 (494), 608-625.

12. Chatterjee, A. and Lahiri, S. N. (2011). Strong consistency of Lasso estimators. **Sankhya Ser A.**, 73 (1), 55-78.

13. Chatterjee, A. (2011). Asymptotic properties of sample quantiles from a finite population. **Annals of the Institute of Statistical Mathematics**, 63 (1), 157-179.

14. Chatterjee, A. and Lahiri, S. N. (2010). Asymptotic properties of the residual bootstrap for Lasso estimators. **Proceedings of the American Mathematical Society**, 138, 4497-4509.

15. Lahiri, S. N. and Chatterjee, A. (2007). A Berry-Esseen theorem for hypergeometric probabilities under minimal conditions. **Proceedings of the American Mathematical Society**, 135, 1535-1545.

16. Lahiri, S. N., Chatterjee, A. and Maiti, T. (2007). Normal approximation to the hypergeometric distribution in nonstandard cases and a sub-Gaussian Berry Esseen theorem. **Journal of Statistical Planning and Inference**, 137 (11), 3570-3590.

Working papers

1. Chatterjee, A., High-dimensional binary regression with misclassified responses.

2. Das, D. and Chatterjee, A., Cross-validated Lasso-type estimators.

3. Mandal, A. and Chatterjee, A., Estimation in networks under sampling.

Unrefereed Proceedings Papers

1. Chatterjee, A., Fuller, W. A. and Opsomer, J. D. (2005). Replication variance estimation for Imputed data. **Proceedings of the Survey Research Methods Section, American Statistical Association**, (CD-ROM), American Statistical Association.

Unpublished Preprints

1. Chatterjee, A., Bandyopadhyay, T. and Adhya, S. (2016). Pseudo-likelihood and bootstrapped pseudo-likelihood inference in logistic regression model with misclassified responses. ISI Delhi preprint `isid/ms/2016/12`.

Presentations

Invited Presentations

Predicting the edge density of a network using sampling: a model assisted approach. At **ISI-ISM-ISSAS Joint Conference**, ISSAS, Taipei, February 2023.

Mini-course on 'Statistical models for network data', at **Bombay Workshop in Statistics and Probability, IIT-Bombay**, January 2023.

Sparse recovery: geometry and intuition. At **Department of Mathematics and Statistics, IIT Kanpur**, November 2019.

The Lasso estimator and some properties. At **Department of Statistics, Delhi University**, Delhi, October 2019.

Higher order asymptotic properties of the bootstrap in high-dimensional linear regression. At **5th IMS-APRM**, Singapore, June 2018.

Higher order asymptotic properties of bootstrapped post-model selection estimators. At **IISA Conference**, Hyderabad, December 2017.

Pseudo-likelihood estimation and bootstrap for binary regression with misclassified responses. At **ISI-ISM-ISSAS Joint Conference,** Institute of Statistical Mathematics, Tokyo, November-December 2017.

Pseudo-likelihood estimation and bootstrap for binary regression with misclassified responses. At **Random Days** workshop, Stat-Math Unit, ISI Kolkata, August 2017.

Bootstrapping pseudo-likelihood estimators in logistic regression with misclassified responses. At **International Chinese Statistical Association** Meeting, Shanghai, December 2016.

Pseudo likelihood and bootstrapped pseudo likelihood estimation for logistic regression with partially misclassified responses. At **Department of Mathematics and Statistics, IIT Kanpur**, September 2016.

Logistic regression and the bootstrap for partially misclassified binary responses. At **Second Indo-Russian Joint Conference in Probability and Statistics**, St. Petersburg, May 2016.

Logistic regression in presence of nuisance parameters. At **National Seminar on Probability and Statistics, West Bengal State University**, Kolkata, March 2016.

Asymptotics for Bridge estimators in high dimensions. At **IISA Conference**, Pune, December 2015.

Invited lecture on 'Introduction to Lasso-type methods' in a short course for FPM program at **IIM Ahmedabad**, August 2014.

Asymptotics for Bridge estimators in high dimensions. At **3rd IMS-APRM**, Taipei, July 2014.

Inference using Adaptive Lasso based residuals. At **ISI-ISM-ISSAS Joint Conference, 2014**, New Delhi, February 2014.

Inference using Adaptive Lasso based residuals. At **CREST-ENSAE**, Paris, January 2014.

Inference using the residuals in a sparse linear regression model. At the **Department of Mathematics and Statistics, University of Paris X**, Nanterre, January 2014.

Inference using the residuals in a sparse linear regression model. At the **2013 Ramanujan Math Society Conference**, Bangalore, June 2013.

Convergence rates for Adaptive Lasso estimators and higher order refinements by the bootstrap. At the **2nd IMS-APRM**, Tsukuba, July 2012.

Variable selection and penalized robust regression for spatial data. At the **International Environmetrics Society Conference, 2012**, Hyderabad, January 2012.

Bootstrapping the Adaptive Lasso estimator: higher order asymptotics. At the **2011 Ramanujan Math Society Conference**, Allahabad, October 2011.

Higher order properties of the bootstrapped Adaptive Lasso estimator. At the **2011 IISA Conference**, Raleigh, April 2011.

Bootstrap for Adaptive Lasso estimators. At the **Department of Statistics, Northern Illinois University**, Dekalb, April 2011.

Asymptotics for Lasso-type estimators in high dimensions. At the **Conference on Resampling Methods and High dimensional data, Texas A&M University**, College Station, March 2010.

Asymptotics for the bootstrapped Lasso estimator. At the **Department of Mathematics and Statistics, IIT Kanpur**, November 2009.

Bootstrapping Lasso estimators. At the **Conference on New directions in Asymptotic Statistics, University of Georgia**, Athens, May 2009.

Bootstrapping Lasso estimators. At the **Department of Statistics, University of Michigan**, Ann-Arbor, February 2009.

Edgeworth expansions for spectral density estimates. At the **Conference on Recent Advances in Statistics, Michigan State University**, East Lansing, MI, May 2008.

Topic Contributed Presentations

Bootstrapping Lasso estimators. At the **Joint statistical meetings of the ASA, ENAR/WNAR, IMS, SSC**. Washington, DC, August 1-6, 2009.

Finite population quantile estimation and the bootstrap. At the **Joint statistical meetings of the ASA, ENAR/WNAR, IMS, SSC**. Denver, CO, August 2-7, 2008.

Contributed Presentations

Variance Estimation for Fractionally Imputed Survey Data. At the **Joint statistical meetings of the ASA, ENAR/WNAR, IMS, SSC**. Minneapolis, MN, August 7-11, 2005.

Teaching[1]

Courses at Indian Statistical Institute

Statistical Inference-I (M.Stat 1st year): Fall 2023 (29), Fall 2021 (30), Fall 2017 (12), Fall 2016 (8), Fall 2013 (15), Fall 2011 (21).

Large Sample Statistical Methods (M.Stat 1st year): Spring 2022 (30), Spring 2016 (8), Fall 2014 (15).

Inference for High-dimensional data (M.Stat 2nd year): Spring 2021 (31).

Special Topics (JRF Statistics): Spring 2020 (1).

High-dimensional Statistics (JRF Statistics): Fall 2019 (1).

Categorical Data Analysis (M.Stat 1st year): Spring 2023 (9), Spring 2019 (5), Spring 2018 (4).

Time Series Analysis (M.Stat 1st year): Spring 2015 (13), Spring 2014 (12), Spring 2013 (16), Spring 2012 (20).

Resampling methods (M.Stat 2nd year): Spring 2011 (3).

Introductory Probability and Statistics (MSQE 1st year): Fall 2010 (22).

Introduction to Stein's method (JRF Statistics): 2023 (1).

Other courses

Quantitative Analysis for Management (PGP-I at IIM Lucknow), as Adjunct Faculty: Term-I 2022 (200), Term-I 2021 (195).

Theory of Statistical Inference (M.S. Non-majors, Texas A&M University): Spring 2010 (38).

Funding

Research grant MTR/2017/000224 under MATRICS program of Science and Engineering Research Board, DST, Government of India, from 2018-2021.

Travel and Research funding under the VI-MSS program of Department of Science & Technology (DST), Government of India and SAMSI: for visit to SAMSI and NCSU (2012).

Travel grant for the 2012 IMS-APRM Conference at Tsukuba, Japan, from Ministry of Statistics and Program Implementation, Government of India.

Travel grant for attending the 2011 IISA conference and academic visits from the National Board for Higher Mathematics (NBHM), Department of Atomic Energy, Govt. of India.

[1] (x) denotes number of students in the course.

Honors and Awards

Microsoft Young Faculty Award, 2011. Awarded from Microsoft Research Labs, India, for young faculty members.

George W. Snedecor Award, 2006. Awarded to the most outstanding Ph.D. candidate in the Department of Statistics, Iowa State University.

Holly and Beth Fryer Award, 2005. Awarded to the best graduate student in the second year of the Ph.D. program in Department of Statistics, Iowa State University.

Professional Activities

Refereeing

Annals of Statistics, Bernoulli, Biometrika, Biometrics, Calcutta Statistical Association Bulletin, Communications in Statistics (Theory & Methods), Computational Statistics and Data Analysis, Electronic Journal of Statistics, Journal of the American Statistical Association, Journal of the Royal Statistical Society (Ser. B), Journal of the Indian Statistical Association, Journal of Machine Learning Research, Journal of Multivariate Analysis, Journal of Nonparametric Statistics, Journal of Statistical Planning and Inference, Journal of Time Series Analysis, Metrika, Scandinavian Journal of Statistics, Statistica Sinica, Statistics and Probability Letters, Statistical Methodology, Sankhya (Series A and Series B), Statistics, Statistics and Computing, Test, The R Journal.

Grant proposal reviewer: NSA (USA), NBHM (India).

Conferences

Organized an invited IISA sponsored session at the ICSA, 2016 (at Shanghai) on 'Resampling methods'.

Organized an invited session at the 3rd IMS-APRM, 2014 (at Taipei) on 'Inference for high-dimensional data'.

PhD student supervision

Anirban Mandal (Statistics SRF), December 2022 - Present.

Masters project supervision

Ayoushman Bhattacharya (M.Stat 2nd year), Fall 2020 - Spring 2021: *Sampling and estimation in networks* (winner of the best-project award among M.Stat 2nd year students).

Bisakh Banerjee (M.Stat 2nd year), Fall 2021 - Spring 2022: *Low rank matrix estimation* (shortlisted for the best-project award among M.Stat 2nd year students).

Sreejit Roy (M.Stat 2nd year), Fall 2022 - Spring 2023. *Topics in matrix completion* (winner of the best-project award among M.Stat 2nd year students).

Debarshi Chakraborty (M.Stat 2nd year), Fall 2022 - Spring 2023. *Non-Gaussian graphical models*.

Mainak Manna (M.Stat 2nd year), Fall 2023 - Spring 2024: *Topics in network community detection*.

Rohan Shinde (M.Stat 2nd year), Fall 2023 - Spring 2024: *Dynamic networks*.

Samya Praharaj (M.Stat 2nd year), Fall 2023 - Spring 2024: *Topics in networks.* Co-supervised with Professor Debraj Das (IIT-B).

Academic visits

Visiting Research Fellow, LabEX and University of Paris Ouest, Nanterre, 12/2013 - 01/2014.

Visiting Research Fellow, SAMSI, 09/2012.

Visiting Research Fellow, Department of Mathematics and Statistics, University of Melbourne, 09/2009 - 10/2009.

Committee service

Served in admission committees for M.Stat and JRF (Statistics) entrance examinations at ISI.

Served in internal departmental committees.