# Curriculum Vita of Moulinath Banerjee

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Work Address University of Michigan Department of Statistics 275, West Hall 1085, South University Ann Arbor, MI 48109, USA.

### **Research Interests**

Likelihood-based methods, Nonstandard asymptotics; Empirical Processes; Threshold and boundary estimation problems; Massive Data Sets and Distributed Methods and Inference; High Dimensional Models; Domain Adaptation and Transfer Learning; Shape-restricted estimation; Graphical networks; Statistical Methods in Astronomy, Biomedical studies, Epidemiology and Bioinformatics.

Education University of Washington, Seattle, WA. Ph.D. (Statistics) December, 2000. Advisor: Jon A. Wellner

**Indian Statistical Institute,** Calcutta, India. M.Stat. 1997, in First Division with Distinction (Specialization in Mathematical Statistics and Probability)

Indian Statistical Institute, Calcutta, India. B.Stat.(Honors) 1995, in First Division with Distinction.

**Employment** Professor of Statistics, University of Michigan. September 2014 —

Associate Professor of Statistics, University of Michigan. September 2007 – August 2014.

Assistant Professor of Statistics, University of Michigan. September 2001 to August 2007.

Lecturer at the University of Washington, Department of Statistics. January through June, 2001.

Awards IMS Laha Travel Award, 2002.

IISA Young Researcher Award in Theory, 2011.

Awarded OVS (Overseas Visiting Scholarship) from St. John's College, University of Cambridge for Easter Term, 2012.

Fellow of IMS (Institute of Mathematical Statistics).

Fellow of ASA (American Statistical Association).

#### Selected Publications

Note: Student and post-doctoral co-authors are underlined.

[1] Banerjee, M. and Wellner J.A. (2001): Likelihood Ratio Tests for Monotone Functions. Annals of Statistics, Vol 29, pages 1699 - 1731.

[2] Banerjee, M. and J.A. Wellner (2005): Confidence Intervals for Current Status Data. Scandinavian Journal of Statistics, Vol 32, pages 405 - 424.

[3] Banerjee, M. (2007): Likelihood based inference for monotone response models. *Annals of Statistics*, Vol 35, No. 3, pages 931–956.

[4] Banerjee, M. and McKeague, I.W.(2007): Confidence sets for split points in decision trees. Annals of Statistics, Vol 35, No. 2, pages 543–574.

[5] Lan, Y., Banerjee, M. and Michailidis, G. (2009): Change point estimation under adaptive sampling. *Annals of Statistics*, Vol 37, 4, 1752–1791.

[6] Banerjee, M., Mishra, S. and Mukherjee, D. (2009): Semiparametric binary regression models under shape constraints with an application to Indian schooling data. *Journal of Econometrics*. Vol. 149, No. 2, 101-117.

[7] <u>Sen, B.</u>, Banerjee, M. and Woodroofe, M.B. (2010): **Inconsistency of bootstrap: the Grenander Estimator.** Annals of Statistics, Vol 38, 4, 1953–1977.

[8] <u>Tang, R.</u>, Banerjee, M. and Michailidis, G. (2011) – A two-stage hybrid procedure for estimating an inverse regression function. *Annals of Statistics*, Vol. 39, 2, 956-989.

[9] Mallik, A., Sen, B., Banerjee, M. and Michailidis, G. (2011) Threshold estimation based on a pvalue framework in dose-response and regression settings. *Biometrika*, Vol. 98, 4, 887-900.

[10] <u>Tang, R.</u>, Banerjee, M. and Kosorok, M. (2012) – Asymptotics for current status data under varying observation time sparsity. *Annals of Statistics*, Vol. 40, 1, 45-72.

[11] Banerjee, M. and Richardson, T. (2013) – Exchangeable Bernoulli random variables and Bayes' postulate. *Electronic Journal of Statistics*, Vol. 7, 2193-2208.

[12] <u>Bagchi, P.</u>, Banerjee, M. and Stoev, S. (2016) – Inference for monotone functions under short and long range dependence: Confidence intervals and new universal limits. *JASA*, (111): 516,1634-1647.

[13] <u>Das, R.</u>, Banerjee, M., Nan, B and Zheng, H. (2016) – Fast estimation of regression parameters in a broken stick model with longitudinal data. JASA, (111):1132–1143.

[14] Song, R, Banerjee, M. and Kosorok, M.R. (2016) – Asymptotics for change point models under varying degrees of misspecification. *Annals of Statistics*, Vol. 44, 1, 153–182.

[15] <u>Lin, J., Basu, S.</u>, Banerjee, M. and Michailidis, G. (2016) – **Penalized** Maximum Likelihood Estimation on Multi-layered Gaussian Graphical Models. *JMLR*, Vol. 17, 146, 1–51.

[16] Banerjee, M., Durot, C. and Sen, B. (2019) — Divide and Conquer in Non-standard Problems and the Super-Efficiency Phenomenon. *Annals of Statistics*, Vol. 47, Pages 720 -757.

[17] Banerjee, M. and Durot, C. (2019) – Circumventing Superefficiency: an Effective Strategy For Distributed Computing in Non-Standard Problems. *Electronic Journal of Statistics*, Number 1 (2019), 1926-1977.

[18] <u>Bhattacharjee, M.</u>, Banerjee, M. and Michailidis, G. (2020): **Change Point** Estimation in a Dynamic Stochastic Block Model. *JMLR*, 21(107):159, 2020.

[19] <u>Mukherjee</u>, D., Banerjee, M. and Ritov, Y. (2021+) – **Optimal Linear Discriminators for the Discrete Choice Model in Growing Dimensions.** *Accepted, Annals of Statistics.* 

[20] <u>Eftekhari, H.</u>, Banerjee, M. and Ritov, Y. (2021): **Inference in High Dimensional Single Index Models under Symmetric Design.** *JMLR*, 22(27):163, 2021. At *https://jmlr.org/papers/v22/19-744.html* 

[21] <u>Mukherjee, D.</u>, Yurochkin, M., Banerjee, M. and Sun, Y. (2020) – **Two** Simple Ways To Learn Individual Fair Metrics From Data. ICML Proceedings, 2020. At https://arxiv.org/abs/2006.11439.

[22] <u>Mukherjee</u>, D., Banerjee, M. and Ritov, Y. (2021+) –**On robust learning in the canonical change point problem under heavy tailed errors in finite and growing dimensions**. To appear in *EJS*. At *https://arxiv.org/abs/2102* 

**Books:** 

M. Banerjee, F. Bunea, J. Huang, V. Koltchinskii and M.H. Maathuis (Eds) (2013). From Probability to Statistics and Back: High-Dimensional Models and Processes - A Festschrift in Honor of Jon A. Wellner. IMS Collections, Volume 9. ISBN: 978-0-940600-83-6.

#### **Lightly Refereed Publications:**

[a] Richardson, T., Bailer, H. and Banerjee, M. (1999): **Specification searches** using MAG models. Proceedings, ISI Conference, Helsinki, 1999.

[b] Richardson, T., Bailer, H. and Banerjee, M. (1999): **Tractable structure** search in the presence of latent variables. In Proceedings of Artificial Intelligence and Statistics '99 (D. Heckerman and J. Whittaker, eds.), Morgan Kaufmann, San Francisco, CA, pp.142-151.

[c] Yudovina, E., Banerjee, M., and Michailidis, G. (2015). Changepoint inference for Erdos–Renyi random graphs. In Stochastic Models, Statistics and Their Applications, pages 197–205. Springer.

[d] Banerjee, M. and Sen, B. (2016). A conversation with Michael Woodroofe. *Statistical Science*, Volume 31, Number 3 (2016), 433-441.

[e] Banerjee, M. and Samworth, R. (2018). A conversation with Jon Wellner. *Statistical Science*, Number 4 (2018), 633-651.

### Ph.D. students

Bodhisattva Sen, joint with Michael Woodroofe, (2008). Thesis: A Study of Bootstrap and Likelihood Based Methods in Non–standard Problems.

Professor of Statistics, Columbia University, New York City.

Jayanta Kumar Pal, joint with Michael Woodroofe, (2006). Thesis: Statistical Analysis and Inference in Shape Restricted Problems with Applications to Astronomy. Senior Data Scientist at Zendrive.

Yan Lan, joint with George Michailidis, (2007). Thesis: Topics on Change Point Estimation under Adaptive Sampling Procedures. Currently employed at Bank of America.

**Runlong Tang**, joint with George Michailidis, (2011). **Thesis:** Adaptive and Multistage Procedures for Inference on Monotone Regression Functions in Designed Studies and Observed Data Settings. **Atul Mallik**, joint with Michael Woodroofe, (2013). **Thesis:** Topics on threshold estimation, multistage methods and random fields. Google.

Nirupam Chakrabarty, joint with George Michailidis, (2014). Thesis: Semiparametric estimation of target location in wireless sensor networks. Wells Fargo.

**Pramita Bagchi**, joint with Stilian Stoev, (2015). **Thesis:** Non–standard statistical inference under short and long range dependence. Assistant Professor, George Mason University.

**Ritabrata Das** (Biostatistics Dept.), joint with Bin Nan, (2015). **Thesis:** Efficient inferential methods in regression models with change points or high–dimensional covariates. Bank of America.

Jiahe Lin, joint with George Michailidis, (2018). Thesis: Modeling and Estimating Multi-block Interactions for High-dimensional Stationary Time Series. Goldman Sachs.

**Zhiyuan Lu**, joint with George Michailidis (2019). **Thesis:** Large Data Applications to Thresholding Problems. FDA.

Mingyuan Gao, joint with George Michailidis (2019). Thesis: Fast and Scalable Methods for Change Point Analysis in High Dimensional Data.

Citadel Securities.

Hamid Eftekhari, joint with Ya'acov Ritov. (2021) Thesis: Inference and Design in High Dimensional Linear Models. Google.

Debarghya Mukherjee, joint with Ya'acov Ritov.

Subha Maity, joint with Yuekai Sun.

Pramit Das, joint with Yuekai Sun.

**Teaching** (i) Statistics 426 : Introduction to Theoretical Statistics for undergraduates.

(ii) Statistics 425: Introduction to Probability.

(iii) Statistics 412: Introduction to Probability and Statistics for Engineers.

(iv) Statistics 510: Mathematical Statistics I, for Masters Students.

(v) Statistics 610: First semester course of Ph.D. sequence in Statistical Theory.

(vi) Statistics 611: Second semester course of Ph.D. sequence in Statistical Theory.

(vii) Statistics 612: Advanced Topics in Theoretical Statistics including Measure Theory based inference.

(viii) Statistics 710/711: Special topics course in Empirical Processes and Concentration Inequalities.

(ix) Statistics 811: Literature Proseminar.

Grants NSF grant, DMS-0306235 (\$105,009)from June 2003 – May 2006. (Extended till May 2007)

University of Michigan Rackham Grant (\$15,000) (2006).

NSF grant, DMS-0705288 (\$185,477) from July 2007 – June 2010.

NSF grant, DMS-1007751 (\$ 250,000) from July 2010 – June 2013. (Extended till June 2014).

NSA grant H98230-11-1-0166 (\$ 28,489  $\times$ 2) from Dec 2010 – Dec 2012.

Associate Professor Grant (Sokol Faculty Award) (\$ 84,099) from University of Michigan, July 2011 – June 2013.

NSF grant DMS-1308890 (\$ 115,000) from September 2013 – August 2016.

NSF grant DMS-1712962 (\$350,000) [joint with Ya'acov Ritov] from July 2017 – June 2020.

NSF grant DMS-1916271 (\$180,000) [joint with Yuekai Sun] from September 2019 – August 2022.

Special COVID-19 Propelling Original Data Science (PODS) Grants Awards, 2020 (\$30,000). Joint with Ya'acov Ritov. May 2020 – December 2020.

NSF Grant ATD 2027737 (\$330,000) [joint with Yuekai Sun].

NSF grant DMS-2113364 (\$400,000) [joint with Ya'acov Ritov].

NSF grant DMS-2113373 (\$150,000) [joint with Yuekai Sun].

## **Professional Activities and Service**

## (a) Editorial Work:

Incoming Editor Statistical Science, 2023-2025

Associate Editor, Annals of Statistics, 2010–2012, 2016–

Associate Editor, Bernoulli, 2021-

Member of Editorial Board, Journal of the American Statistical Association, 2014–2020.

Associate Editor, Electronic Journal of Statistics, 2013–.

Associate Editor, Sankhya, Ser. A, 2008-

Member of the Editorial Board, International Journal of Biostatistics, 2006-

Member of editorial board for IMS collections volume 'From Probability to Statistics and Back: High Dimensional Models and Processes. A Festschrift in Honor of Jon Wellner'.

**Guest Editor**, for Special Volume on 'Application of concentration inequalities and empirical processes to modern statistics' for *Sankhya*.

## (b) Membership in Societies and Committees:

Member of IMS (Institute of Mathematical Statistics), ASA (American Statistical Association) and Lifetime Member of IISA (International Indian Statistical Association).

Member of IMS-APRM scientific program committee from 2010–2014.

Member of charting committee of ISNPS (International Society for Nonparametric Statistics).

Member of Scientific Program Committee for IISA meetings, Chennai 2013.

Member of Young Investigator Awards committee for IISA meetings, Chennai 2013.

Chair of Young Investigator Awards committee for IISA meetings, Riverside 2014.

Chair of Student Paper Competition for IISA meetings, Riverside, 2014.

Member of the International Program Committee for IISA meetings, Pune, 2015.

Member of JSM 2016 Program Committee, IISA representative.

Representative of IISA at the 2016 ICSA meeting in China.

Member of Scientific Program Committee, IISA meetings, Hyderabad, 2017.

# (c) Refereeing and Reviewing:

Referee for Annals of Statistics, JASA, Bernoulli, Biometrika, JCGS, JRSS-B, Biostatistics, Computational Statistics and Data Analysis, International Journal of Biostatistics, Journal of Nonparametric Statistics, Journal of Statistical Computation and Simulation, Journal of Statistical Planning and Inference, Statistics and Probability Letters, ESAIM – Probability and Statistics, Technometrics.

# (d) Other service to the profession:

Has served multiple times as NSF panel member for the Statistics Program under DMS. Has reviewed multiple grants for NSA and NSERC (Canada).

# (e) Departmental Service:

Faculty Hiring Committee, Qualifying Review Committee, Seminar Committee, Graduate Admissions Committee, Undergraduate Program Advisory Committee, Financial Engineering Committee, Co-chair of the Statistics Undergraduate Honors Program, Woodroofe Committee (Chair), Admissions Committee for Financial Engineering, Theoretical Committee for the Graduate Program, Library Committee, Departmental Seminar Committee, Applied Masters in Statistics Program Advisor.