

Moulinath Banerjee

Work Address

University of Michigan
Department of Statistics
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Research Interests

Likelihood-based methods, Nonstandard asymptotics, Shape-restricted estimation, Statistical Methods in Astronomy, Biomedical studies and Epidemiology, Threshold estimation problems.

Education **University of Washington**, Seattle, WA. Ph.D. (Statistics) 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 Associate Professor of Statistics, University of Michigan. September 2007 – .

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.

Teaching (i) Statistics 426 : Introduction to Theoretical Statistics for undergraduates. Fall Semester, 2001 – 2006, Winter Semester, 2002 – 2004, 2006 – 2008.

(ii) Statistics 425: Introduction to Probability. Winter Semester, 2008.

(ii) Statistics 412: Introduction to Probability and Statistics for Engineers. Winter Semester, 2002 and Fall Semester, 2003.

(iii) Statistics 610: First semester course of Ph.D. sequence in Statistical Theory. Fall Semester, 2008.

(iii) Statistics 611: Second semester course of Ph.D. sequence in Statistical Theory. Winter Semester, 2003, 2009.

(iv) Statistics 612: Advanced Topics in Theoretical Statistics including Measure Theory based inference. Fall Semester, 2005 and 2006.

Ph.D. students

Bodhisattva Sen, joint with Michael Woodroffe, (2004–2008). **Thesis:** A Study of Bootstrap and Likelihood Based Methods in Non-standard Problems. Currently employed as Tenure-track Assistant Professor of Statistics, Columbia University, New York City.

Jayanta Kumar Pal, joint with Michael Woodroffe, (2003–2006). **Thesis:** Statistical Analysis and Inference in Shape Restricted Problems with Applications to Astronomy. Currently employed at Research and Analytics Group, Hewlett Packard, Bangalore, India.

Yan Lan, joint with George Michailidis, (2003–2007). **Thesis:** Topics on Change Point Estimation under Adaptive Sampling Procedures. Currently employed at Abbott Laboratories, Chicago, IL.

Runlong Tang, joint with George Michailidis, (2006–). **Thesis:** In progress.

Awards and Grants

IMS Laha Travel Award, 2002.

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

Professional Activities

(a) Conference and Workshop Organization:

- **Joint Statistical Meetings, 2002.** New York City, NY, USA. August 11 – August 15, 2002. *Session Organizer* of Topic Contributed Session on “Inference for Censored Data Models”. *Chair* of Contributed Session on “Topics in Nonparametrics, Bootstrap, Models with Nuisance Parameters”.

- **Joint Statistical Meetings, 2005.** Minneapolis, MN, USA. August 7 – August 11, 2005. *Session Organizer* of Topic Contributed Session on “Nonparametric Function Estimation”.
- **ENAR Meetings, 2006.** Tampa, FL, USA. March 26 – March 29, 2006. *Session Organizer* of Invited Session on “Nonstandard Maximum Likelihood Inference”.
- **Joint Statistical Meetings, 2006.** Seattle, WA, USA. August 7 – August 11, 2005. *Session Organizer and Discussant* of Topic Contributed Session on “Topics in Function Estimation Using Isotonization and Smoothing Techniques”.
- **WNAR Meetings, 2007.** UC Irvine Campus, CA, USA. June 24 – June 27, 2007. *Session Organizer* of Invited Session on “Empirical Processes Theory and its Applications”.
- **Joint Statistical Meetings, 2007.** Salt Lake City, Utah, USA. July 29 – Aug 2, 2007. *Session Organizer* of Invited Session on “Threshold Estimation for Functions in Nonparametric and Semiparametric Problems.”
- **International Society of Business and Industrial Statistics, 2008.** Prague, Czech Republic. July 1 – July 4, 2008. *Invited Session Organizer*.
- **IMS Pacific Rim Conference, 2009.** Seoul, Korea, June 28 – July 1, 2009. *Session Organizer* of Invited Session on “Recent developments in resampling methods and inference”.
- **JSM 2009,** Washington DC. August 1 –6, 2009. *Session Organizer* of invited IMS session on “ Threshold Estimation”.

(b) Presentations at Conferences and Workshops:

Workshop on Inverse Problems in Statistics. EURANDOM, Eindhoven, The Netherlands. January 25-27, 2001. Invited Speaker.

International Conference on Current Advances and Trends in Nonparametric Statistics. Crete, Greece. July 15-19, 2002. Invited Speaker in session on “Hypothesis Testing with applications in Biostatistics”

IMS Annual Meeting, 2002. Banff, Canada. July 28 - July 31, 2002. Invited Speaker in session on “Likelihood ratio inference in regular and nonregular problems”.

Joint Statistical Meetings, 2002. New York City, NY, USA. August 11 - August 15, 2002. Speaker in Topic Contributed Session on “Inference for Censored Data Models”.

AMS Sectional Meeting, Nov 9–10, 2002. University of Central Florida, Orlando, USA. Invited Speaker in Special Session on “The Likelihood Inferences in Statistics.”

Summer Workshop Instructor at Torgnon, Italy, Jun 30 – Jul 19, 2003 on *Empirical Processes: Theory and Applications*, with Professor Jon A. Wellner. Organized by Bocconi University, Italy.

WNAR Meetings, 2004. Albuquerque, NM, June 27 - June 30, 2004. Speaker in Invited Session on “Interval Censored Data: Theory and Methods.”

Invited Participant in the RIP (Research in Pairs) program. Mathematisches Forschungsinstitut, Oberwolfach, Germany. 14th March, 2005 – 1st April, 2005. (Shape-Constrained Estimation and Testing and Related Inverse Problems.)

Joint Statistical Meetings, 2005. Minneapolis, MN, USA. August 7 - August 11, 2005. Speaker in Topic Contributed Session on “Nonparametric Function Estimation”.

A Conference on Nonparametric Inference and Probability with Applications to Science: Honoring Michael Woodrooffe’s Career and 65th Birthday, 24–25th Sep., 2005, Ann Arbor, MI. Invited Speaker.

ENAR Meetings, 2006. Tampa, FL. March 26 - March 29, 2006. Speaker in Invited Session on “Nonstandard Maximum Likelihood Inference”.

IMS Annual Meetings, 2006. Rio De Janeiro, Brazil. July 30 – August 4, 2006. Speaker in Invited Session on “Inverse Problems, Deconvolutions and Applications”.

Conference on “Qualitative Assumptions and Regularization in High-Dimensional Statistics”. Mathematisches Forschungsinstitut Oberwolfach (Germany), November 5 – November 11, 2006. Invited Participant.

S.N. Roy Memorial Conference. Calcutta, India. December 28 – December 29, 2006. Invited Speaker.

IISA Joint Statistical Meeting and International Conference on Statistics, Probability and Related Areas. Cochin, India. January 2-5, 2007. Invited Speaker.

Joint Statistical Meetings, 2007. Salt Lake City, Utah, USA. July 29 – Aug 2, 2007. *Discussant* of Invited Session on “Threshold Estimation for Functions in Nonparametric and Semiparametric Problems.”

International Conference on Statistical Paradigms: Recent Advances and Reconciliations, January 2008. ISI, Kolkata. Invited Speaker.

International Society of Business and Industrial Statistics, 2008. Prague, Czech Republic. July 1 – July 4, 2008. *Invited Speaker.*

Forthcoming **Symposium on New Directions in Asymptotic Statistics**, University of Georgia, Athens, GA. May 15 and 16, 2009. *Invited Speaker.*

Forthcoming **IMS Pacific Rim Conference.** Seoul, Korea, June 28 – July 1, 2009. Invited Speaker in "Session on Interval Censored Data".

Forthcoming **JSM 2009.** Washington DC. Aug 1 – Aug 6, 2009. Invited Speaker in session on "Recent Advances in Nonparametric Methods for Interval Censored Data".

(c) Departmental Seminars:

Dept. of Statistics, Rutgers University, Piscataway, NJ. 3rd April, 2002.

Dept. of Statistics, University of Georgia, Athens, GA. 13th March, 2003.

Dept. of Biostatistics, Univ. of Michigan, Ann Arbor, MI. 13th Nov, 2003.

Dept. of Statistics, Univ. of Chicago, Chicago, IL. 17th Nov, 2003.

Dept. of Statistics, Stanford University, CA. 22nd Feb, 2005.

EURANDOM, Eindhoven, The Netherlands. 5th April, 2005.

Stat–Math Unit, Indian Statistical Institute, Kolkata, India. 18th July, 2005.

Dept. of Biostatistics, Columbia University. 20th October, 2005.

AT&T Labs – Research, Florham Park, NJ. 21st October, 2005.

Dept. of Biostatistics, Univ. of Minnesota, Minneapolis, MN. 25th Oct, 2006.

Dept. of Statistics, North Carolina State University. 16th Mar, 2007.

Stat–Math Unit, Indian Statistical Institute, Kolkata, India. 25th June, 2007.

Dept. of Statistics, Ohio State University. 3rd May, 2007.

Dept. of Statistics, Michigan State University. 16th October, 2007.

Joint Statistics Seminar, McGill, Universite' de Montre'al, UQAM and Concordia. 23rd November, 2007.

Dept. of Biostatistics, UNC Chapel Hill. 27th February, 2008.

Dept. of Mathematics, ETH Zurich, Switzerland. 30th June, 2008.

Dept. of Mathematics, IISC, Bangalore, India. 12th and 13th August, 2008.

Dept. of Statistics, Penn State University, State College, PA. 23rd October, 2008.

B.I.R.U Seminar, ISI Kolkata, 7th January, 2009.

Dept. of Statistics, Purdue University, IN. 23rd April, 2009.

(d) Refereeing and Reviewing:

Referee for Annals of Statistics, JASA, Bernoulli, Biometrika, JCGS, 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.

Reviewer for “Empirical Likelihood” by Owen(2000). Published in *Sociological Methods and Research*, **31**, 4, pp. 545–550.

(e) Membership in Societies:

Member of IMS (Institute of Mathematical Statistics) and ASA (American Statistical Association).

(f) Editorships:

Member of the Editorial Board, *International Journal of Biostatistics*.

Associate Editor, *Sankhya, Ser. A*

(g) Other service to the profession:

Served as NSF panel member for the Statistics Program under DMS in 2007 & 2008.

Departmental Service

(2008-2009) Graduate Admissions Committee, Graduate Curriculum Committee, Qualifying Review Committee, Co-chair of the Statistics Undergraduate Honors Program, Woodroffe Committee (Chair), Admissions Committee for Financial Engineering.

(2007-2008) Graduate Admissions Committee, Undergraduate Curriculum Committee, Qualifying Review Committee, Co-chair of the Statistics Undergraduate Honors Program, Outreach Committee, Woodroffe Committee (Chair), Admissions Committee for Financial Engineering.

(2006-2007) Graduate Admissions Committee, Undergraduate Curriculum Committee, Qualifying Review Committee, Admissions Committee for Financial Engineering.

(2005-2006) Qualifying Review Committee and the Theoretical Committee for the Graduate Program.

(2004–2005) Qualifying Review Committee and Library Committee.

(2003–2004) Curriculum Committee, Qualifying Review Committee and Library Committee. Organized the Departmental Seminar in Winter Semester, 2004.

(2002–2003) Graduate Admissions Committee, Library Committee and Qualifying Review Committee. Prepared (in part) and graded the QR exams on Theoretical Statistics.

(2001–2002) Curriculum Committee and Graduate Admissions Committee.

Publications in Refereed Journals

Published/To Appear/Accepted:

[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 Richardson, T. (2003): **On a Dualization of Graphical Gaussian Models: A Correction Note.** *Scandinavian Journal of Statistics*, Vol 30, pages 817–821.

[3] Banerjee, M. (2005): **Likelihood Ratio Tests Under Local Alternatives in Regular Semiparametric Problems.** *Statistica Sinica*, Vol 15, No. 3, pages 635 - 644.

[4] Banerjee, M. (2005): **Likelihood Ratio Tests Under Local and Fixed Alternatives in Nonstandard Problems.** *Scandinavian Journal of Statistics*, Vol 32, pages 507 – 525.

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

- [6] Banerjee, M. and Wellner J.A. (2005): **Score Statistics for Current Status Data: Comparisons with Likelihood Ratio and Wald Statistics.** *The International Journal of Biostatistics*, Vol. 1, No. 1, Article 3.
- [7] Banerjee, M., Biswas, P. and Ghosh, D. (2006): **A Semiparametric Binary Regression Model Involving Monotonicity Constraints.** *Scandinavian Journal of Statistics*, Vol 33, pages 673 - 699.
- [8] Banerjee, M. (2007): **Likelihood based inference for monotone response models.** *Annals of Statistics*, Vol 35, No. 3, pages 931–956.
- [9] 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.
- [10] Sen, B. and Banerjee, M. (2007): **A pseudolikelihood method for analyzing interval censored data.** *Biometrika*, Vol 94, pages 71 - 86.
- [11] Banerjee, M. and McKeague, I.W. (2007): **Estimating optimal step-function approximations to instantaneous hazard rates.** *Bernoulli*. Volume 13, Number 1, pages 279-299.
- [12] Banerjee, M. (2008): **Estimating monotone, unimodal and U-shaped failure rates using asymptotic pivots.** *Statistica Sinica*. Volume 18, pages 467–492.
- [13] Pal, J. and Banerjee, M. (2008): **Estimation of smooth link functions for monotone response models.** *Journal of Statistical Planning and Inference*. Volume 138, Issue 10, pages 3125-3143.
- [14] Banerjee, M. (2008): **Inference in exponential family regression models under certain shape constraints using inversion based techniques.** To appear in *Advances in Multivariate Statistical Methods*, Statistical Science and Interdisciplinary Research, World Scientific, Vol. 4.
- [15] Lan, Y., Banerjee, M. and Michailidis, G. (2008): **Change point estimation under adaptive sampling.** To appear in *Annals of Statistics*.
- [16] Ghosh, D., Banerjee, M. and Biswas, P. (2008): **Inference for constrained estimation of tumor size distributions.** In *Biometrics*, **64**, No.4., World Scientific.
- [17] Sen, B., Banerjee, M., Woodroffe, M.B., Mateo, M. and Walker, M. (2008): **Streaming motion in Leo 1.** *Annals of Applied Statistics*, Volume 3, 1, 96-116.
- [18] Banerjee, M., Mishra, S. and Mukherjee, D. (2008): **Semiparametric binary regression models under shape constraints with an application to Indian schooling data.** *Journal of Econometrics*, Volume 149, No. 2, 101-117.

[19] Sen, B., Banerjee, M. and Woodroffe, M.B. (2007): **Inconsistency of bootstrap: the Grenander Estimator.** Accepted subject to minor revisions by *Annals of Statistics*.

Submitted and Current/Ongoing Projects (in preparation):

[1"] Asymptotics for current status data under varying degrees of sparsity of observation times. With Runlong Tang and Michael Kosorok.

[2"] Identifying zero thresholds for functions using P-values as a discrepancy criterion. With Bodhisattva Sen and George Michailidis.

[3"] Adaptive estimation for the two-phase continuous linear regression model . With Runlong Tang and George Michailidis.

[4"] A two-stage procedure hybrid procedure for estimating an inverse regression function. With Runlong Tang and George Michailidis. (Submitted to *Annals of Statistics*.)

[5"] Multistage adaptive nonparametric procedures for estimating a threshold value for a monotone function. With Runlong Tang and George Michailidis.

Publications in Proceedings

[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.