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Research Interests

- Semiparametric inference and empirical processes
- Nonparametric function estimation (especially with shape constraints)
- Non-standard asymptotics and bootstrap inference
- Statistical methods and applications in image processing and astronomy

Education

- Columbia University: Ph.D. in Statistics 2010–2016
  Thesis Advisor: Bodhisattva Sen.
- Columbia University: Master of Arts in Statistics 2010–2011
- Indian Statistical Institute: Master of Statistics. 2008–2010
  Specialization: Mathematical Statistics and Probability
- Indian Statistical Institute: Bachelor of Statistics (Distinction) 2005–2008

Publications and Preprints

1. **Patra, R. K.** and Sen, B. (2015). Estimation in a Two-component Mixture Model with Applications to Multiple Testing. *J. Roy. Statist. Soc. Ser. B.* (accepted)
   http://arxiv.org/abs/1204.5488
   R–code: http://stat.columbia.edu/~rohit/Code/NPMixModelCode.pdf

2. **Patra, R. K.**, Seijo, E., and Sen, B. (2015). A consistent bootstrap procedure for the maximum score estimator "revision submitted" at *J. Econometrics*
   http://arxiv.org/abs/1105.1976
   R–code: http://stat.columbia.edu/~rohit/Code/MSECode.pdf

3. **Patra, R. K.**, Sen, B., and Székely, G. (2015). On a Nonparametric Notion of Residual and its Applications. *Statist. Probab. Lett.* (accepted)
   http://arxiv.org/abs/1409.3886
   R–code: http://stat.columbia.edu/~rohit/Code/NPResCode.pdf

4. **Patra, R. K.** (2015) Efficient Estimation in Smooth Single Index Models.
   http://stat.columbia.edu/~rohit/PapersandDraft/smoothsim.pdf
   R–package: https://cran.r-project.org/web/packages/simest/

5. Kuchibhotla, A. K., **Patra R. K.**, and Sen, B. (2015). On Single Index Models with Convex Link
   http://stat.columbia.edu/~rohit/PapersandDraft/cvxsim.pdf
   R–package: https://cran.r-project.org/web/packages/simest/

6. Liu, J., Zhou, X., **Patra, R. K.**, and Weinan, E. (2011). Failure of random materials: A large deviation and computational study. *Proceedings of the 2011 Winter Simulation Conference.*, 3779 - 3789
   http://dx.doi.org/10.1109/WSC.2011.6148070

7. **Patra, R. K.**, Mandal, A., and Basu, A. (2008). Minimum Hellinger Distance Estimation with Inlier Modification. *Sankhya: Series B*, **70** (2), 310-322
   www.jstor.org/stable/41234437

Ongoing Inter-disciplinary Collaborations

1. Statistical tools to Categorize Debris Morphologies in a Galaxy– with Biswas, R., Hendel, D., Johnston, K.V., and Sen, B.
   Brief description: http://stat.columbia.edu/~rohit/PapersandDraft/astro_acree.pdf

Teaching Experience

- **Instructor** for W1211: Introduction to Statistics (with Calculus) Fall 2013
  —created syllabus, course material and taught twice a week to a class of 35 undergraduate students from various disciplines and backgrounds
- **Instructor** for Qualifying Exam Prep. in Probability for Ph.D. students 2013–15
  —created syllabus, course material and taught once a week during the summer for Ph.D students
- Teaching Assistant
  1. Statistical Inference for Ph.D students: G6107-08 2012, Spring 2014, Fall 2015
  2. Elementary Stochastic Processes: W4606 Spring 2015
  3. Probability and Statistical Inference: W4109 Spring 2011, Fall 2014
  4. Stochastic Processes and Applications: G6501 Spring 2013
  5. Introduction to Statistics: W1211 Fall 2010

Internship

- Research intern the Data Science group of American Insurance Group, New York, Summer, 2014.
  —lead researcher in building a prototype image identification and damage detection system using statistical tools

Conference and Poster Presentation

1. **Invited** presentation at the Shape-restricted function estimation, Joint Statistical Meetings, Boston, August, 2014.
2. Contributed poster at the Joint Statistical Meetings in Seattle, Washington, August, 2015.
3. Contributed poster at the NSF Workshop for Empirical Process and Modern Statistical Decision Theory on the Occasion of the 65th Birthday of David Pollard, May, 2015.
4. Invited presentation at the Minghui Memorial Conference, Columbia University, March, 2015.
5. Student presentation at International Indian Statistical Association Conference, Riverside, CA, July, 2014.
6. Invited presentation at the Minghui Memorial Conference, Columbia University, March, 2013.
7. Presentation at the department student seminar, November, 2013 and March, 2015.

Honors and Awards

1. Travel award for Joint Statistical Meetings in Seattle, Washington, Graduate School of Arts and Sciences, August, 2015.
2. Travel funding, NSF Workshop for Empirical Process and Modern Statistical Decision Theory on the Occasion of the 65th Birthday of David Pollard, May, 2015.
3. Dewesh-Kamal scholarship for studies abroad, Ramakrishna Mission Institute of Culture, Kolkata, August, 2010.
4. National Fellowship in basic sciences (Kishore Vaigyanik Protsahan Yojana), Department of Science and Technology, Government of India, 2005–2010.
5. Awards of Academic Excellence, Indian Statistical Institute, Kolkata, 2009.
6. National Initiative on Undergraduate Science Fellowship, Homi Bhabha Center for Science Education, Mumbai, India, June, 2006.

Professional Services and Activities

1. **Reviewer for**: Annals of Applied Statistics; Journal of Nonparametric Statistics; Journal of the American Statistical Association; Statistica Sinica.
2. Local **organizer** of The Fifth International Workshop in Sequential Methodologies, 2015
3. **Organizer** of the Student Reading Group in the Statistics Department, 2015.

Courses Take During Ph.D

Bayesian nonparametrics; Causal Inference; Computational Probability; Communication in Statistics; Copulas in Statistics; Empirical Bayes; Empirical Processes and Large Deviation; Empirical Process Theory; Foundations of Optimization; Long Range Dependence; Modeling Heavy-Tailed Time Series; Survival Analysis; Topics in Stochastic Analysis.

Professional Memberships

Institute of Mathematical Statistics; American Statistical Association.

Scientific Software

Extensive experience with R and MATLAB, including the use of high performance computing environment.

References

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