

# Ranjan Maitra

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Iowa State University  
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## Research Interests

Analysis of Large Datasets, Bioinformatics, Data Mining, Spatial Statistics and Image Analysis, Statistical Computing, Multivariate Statistics

## Education

Ph. D.	Statistics	1996	University of Washington, Seattle.
M. Stat.	Statistics	1992	Indian Statistical Institute, Calcutta.
B. Stat. (Hons.)	Statistics and Mathematics	1990	Indian Statistical Institute, Calcutta.

## Professional Experience

2003 – present	Associate Professor	Department of Statistics, Iowa State University.
2003 – 2003	Associate Professor	Department of Mathematics and Statistics, University of Maryland Baltimore County.
1997 – 2003	Assistant Professor	Department of Mathematics and Statistics, University of Maryland Baltimore County.
1996 – 1998	Research Scientist	Statistics and Data Mining Research Group, Bell Communications Research (Bellcore). ( <i>On leave: 1997-98</i> )

## Professional Awards

1. 2003: National Science Foundation (NSF) CAREER Award.
2. 1998: American Statistical Association (ASA) award for Best Contributed Paper in Statistical Computing at the 1998 Joint Statistical Meetings (JSM) in Dallas, Texas, USA. This paper (*Clustering Massive Datasets*) was judged the best out of over 80 entries submitted in this category.
3. 1997: Nominated for Francois Erbsman award (*only statistician*) for young scientists under 35 years of age, at the 1997 Information Processing in Medical Imaging (IPMI) meetings.
4. 1996: American Statistical Association (ASA) Student Paper Competition award for the paper “Estimating Precision in Functional Images”. This paper was one of four selected for presentation at the Statistical Computing Session of the 1996 Joint Statistical Meetings in Chicago.
5. 1996: Award for Best Poster “Estimating the Variability in Reconstructed PET Images” at the Student Poster Session of the 1996 Spring Pacific Northwest Statistics Meetings, held in Seattle, April 12, 1996.
6. 1995: Award for Best presented paper “Estimating Variability in PET Reconstructions” at the 1995 Student Paper Competition of the Western North American Region (WNAR) of the International Biometric Society, at the Joint WNAR/IMS Meetings held at Stanford, California, June 26-28, 1995.

## List of Publications

### Peer-Reviewed Publications:

1. Gullapalli, R. P., Maitra, R., Roys, S. R., Greenspan, J. D., Smith, G. and Alon, G. (2005). Reliability Estimation of Grouped functional Imaging Data Using Penalized Maximum Likelihood. *Magnetic Resonance in Medicine*, 53:1126-1134.
2. Nusser, S. M., Intille, S. S. and Maitra, R. (2005) Emerging Technologies and Next Generation Intensive Longitudinal Data Collection. In *Models for Intensive Longitudinal Data*, Walls, T. A. and Schafer, J. S. (Eds.), Oxford University Press, New York, in press.
3. Zhuo, J., Roys, S. R., Lefkowitz, D. M., Maitra, R., Bedekar, G., Greenspan, J. D. and Gullapalli, R. P. (2005). Test-Retest Study of Variability in Diffusion Parameters in Brain Regions. Human Brain Mapping, in press.
4. Maitra, R., Sinha, B. K., Ross, N. P., Sinha, B. K., Lee, J., Herczeg, S. (2003). On Some Aspects of Data Integration Techniques with Applications. *East-West Journal of Mathematics: Computational Mathematics and Modeling, An International Conference, Bangkok*, 241–256.
5. Maitra, R. (2002). A Statistical Perspective on Data Mining. *Journal of the Indian Society for Probability and Statistics*, 6:28-77.
6. Maitra, R., Roys, S. R. and Gullapalli, R. P. (2002). Test-Retest Reliability Estimation of fMRI Data. *Magnetic Resonance in Medicine*, 48:62-70.
7. Roys S. R., Maitra R., Greenspan J. D. and Gullapalli R. P. (2002). Group Analysis of fMRI Data using Penalized Maximum Likelihood Method. *Proceedings of the 10th International Society of Magnetic Resonance in Medicine, Honolulu*, May 2002, pp. 1428.
8. Lefkowitz D., Read K., Maitra R. and Gullapalli R. (2002). Intra-subject and Inter-subject Variability of SVS vs CSI Spectra from Spatially Matched Voxels. *Proceedings of the 10th International Society of Magnetic Resonance in Medicine, Honolulu*, May 2002, pp. 2509.
9. Maitra, R. (2001) Clustering Massive Datasets with Applications in Software Metrics and Tomography. *Technometrics*, 43:3:336-46.
10. Maitra, R. and Dalal, S. R. (2001), Pay-phones, Parking-meters, Vending Machines and Bayesian Prediction of Fill-Times, *Journal of the American Statistical Association*, 96:454:476-87.
11. Maitra, R., Roys, S. R., Greenspan, J. and Gullapalli, R. P. (2001). Resampling Methods to Test Reliability of Motion-Corrected fMRI Data. *Proceedings of the 9th International Society of Magnetic Resonance in Medicine, Glasgow*, April 2001, pp. 1202.
12. Roys, S. R., Maitra, R. and Gullapalli, R. P. (2001). A Comprehensive Approach to Estimating Test-Retest Reliability in fMRI. *Proceedings of the 9th International Society of Magnetic Resonance in Medicine, Glasgow*, April 2001, pp. 1718.
13. Maitra, R. and Gullapalli, R. P. (2000). Comment on “A Bayesian Time-Course Model for Functional Magnetic Resonance Imaging Data” by Chris Genovese, *Journal of the American Statistical Association*, 95:451:707-8.
14. Maitra, R. (1998). An Approximate Bootstrap Technique for Variance Estimation in Parametric Images. *Medical Image Analysis*, 2:4:379-82.

15. Maitra, R. and O'Sullivan, F. (1998). Variability Assessment in Positron Emission Tomography and Related Generalized Deconvolution Models. *Journal of the American Statistical Association*, 93:444:1340-55.
16. Maitra, R. and Besag, J. E. (1998). Bayesian Reconstruction in Synthetic Magnetic Resonance Imaging. *Bayesian Inference in Inverse Problems. Proceedings of the Society of Photo-Optical Instrumentation Engineers (SPIE 1998) Meetings, Vol. 3459: A Mohammad-Djafari Ed.*, pp. 39-47.
17. SenGupta, A. and Maitra, R. (1998). On Best Equivariance and Admissibility of Simultaneous MLE for Mean Direction Vectors of Several Langevin Distributions. *Annals of the Institute of Statistical Mathematics*, 50:4:715-27.
18. Maitra R. (1997). Estimating Precision in Functional Images. *Journal of Computational and Graphical Statistics*, 6:132-42.
19. Maitra, R. (1997). Synthetic Resampling Methods for Variance Estimation in Parametric Images. *Springer-Verlag Lecture Notes in Computer Science Series: Information Processing in Medical Imaging.*, 1230:271-84.
20. Maitra, R. and O'Sullivan, F. (1996). Estimating the Variability in Functional Images Using a Synthetic Resampling Approach. *1996 IEEE Nuclear Science Symposium and Medical Imaging Conference Record*, 3:1867-71.
21. Maitra, R. and O'Sullivan, F. (1995). Estimating the Variability of Reconstructed PET Data: A Technique based on Approximating the Reconstruction Filter by a Sum of Gaussian kernels. *1995 IEEE Nuclear Science Symposium and Medical Imaging Conference Record*, 3:1411-14.

#### **Books and Monographs:**

1. Maitra, R., Sinha, B. K., Ross, N. P., Lee, J. Herczeg, S. (2003). *Combining Environmental Indicators*. Monograph on Series in Statistical Methodology, Office of Environmental Information, United States Environmental Protection Agency, Washington DC. (*Refereed Monograph.*)

#### **Book Reviews:**

1. Maitra, R. (2006). Review of "Independent Component Analysis: A Tutorial Introduction" by James V. Stone (MIT Press). *Technometrics*, to appear.
2. Maitra, R. (2005). Review of "Statistical Computing for the Social Scientist" by Micah Altman, Jeff Gill, Michael P. McDonald (John Wiley). *Technometrics*, 47:2:241-2.
3. Maitra, R. and Mathew, T. (2000). Review of "Analysis of Variance in Statistical Image Processing" by Ludwik Kurz and M. Hafeed Benteftifa, Cambridge University Press. *Technometrics*, 42:2:212-3.

#### **Manuscripts submitted or in Preparation:**

1. Maitra R. (2005). Initializing Optimization Partition Algorithms. *Submitted to Biometrics*.
2. Ellis, N. and Maitra, R. (2005). On the Simulation of Multivariate Gaussian Observations Outside Arbitrary Ellipsoids. *Submitted to J. Comp. Graph. Stat.*
3. Moulton, E. A., Keaser, M. L., Gullapalli, R. P., Maitra, R. and Greenspan, J. D. (2005). Modulation of nociceptive fMRI activation through placebo analgesia. *Tentatively accepted for publication in Pain*.

4. Maitra, R. (2006). Generalized Cross-Validated Bandwidth Estimation for PET and Related Generalized Deconvolution Models. *In preparation for submission to Biometrics.*
5. Maitra, R. (2006). A Fully Bayesian Approach to Test-Retest Reliability Estimation of fMRI Data. *In preparation for submission to Biometrics.*
6. Maitra, R. (2003). Clustering Massive Datasets from Arbitrary Mixtures of Gaussian Populations. *In preparation for submission to Journal of American Statistical Association.*
7. Maitra, R. and Webb, D. W. (2006). An E-M Approach to ML Parameter Estimation in Live-fire Ammunition Testing. *In preparation for submission to Technometrics.*

#### **Other Research Publications:**

1. Guidi, R. M. and Maitra, R. (2000). Fast Simulation of Cluster Processes. *Manuscript available from <http://www.math.umbc.edu/~maitra/papers/markov.pdf>*
2. Maitra, R. (1999). Dynamic Visualization of List-Mode Acquired PET Data. (*Manuscript available from <http://www.math.umbc.edu/~maitra/papers/ipmi99.pdf>*)
3. Maitra, R. (1998), Clustering Massive Datasets. *This manuscript won the Best Contributed Paper award in Statistical Computing at the 1998 Joint Statistical Meetings.*
4. Maitra, R., Hausman, R. E., and Sabor, W. N. (1996). Mining Data to Improve Reliability of Software Fault Predictions, *Tech. Memo. # TM-25-702, Bellcore, restricted access.*
5. SenGupta, A. and Maitra, R. (1994). Admissibility of the Mean Direction in Several Independent Langevin Populations. *Tech. Rep. # 270, Department of Statistics and Applied Probability, University of California, Santa Barbara.*

### **Research Support and Fellowships**

#### **External Support (Active and Past):**

2005-10	\$2,312,455 (total costs). Research and Training of Graduate Students, National Science Foundation. <i>Senior Personnel.</i>
2004-09	\$ 302,764 (total costs, <i>Iowa State University portion</i> ). Research Grant, National Institutes of Health. <i>Principal Investigator, Sub-contract from Johns Hopkins University.</i>
2003-08	\$ 400,017 (total costs). CAREER Award, National Science Foundation. <i>Principal Investigator.</i>
2003-04	\$8,050 (direct costs, <i>UMBC portion</i> ). Research Grant, National Institutes of Health. <i>Principal Investigator, Sub-contract from University of Maryland Medical School, Baltimore.</i>
2002-05	\$ 152,835. Inter-Personnel Agreement, United States Environmental Protection Agency (EPA), Washington DC. <i>Principal Investigator.</i>
2001-02	\$ 39,965.04. Inter-Personnel Agreement, United States Environmental Protection Agency (EPA), Washington DC. <i>Principal Investigator.</i>
2000-01	\$ 37,230.10. Research Grant, Telcordia Technologies, Morristown, NJ. <i>Principal Investigator.</i>
1999	\$ 13,867. Research Grant, Telcordia Technologies, Morristown, NJ. <i>Principal Investigator.</i>
1998	\$ 12,000 (direct costs, <i>UMBC portion</i> ). Research Grant, National Science Foundation. <i>Principal Investigator, Sub-contract from Carnegie Mellon University.</i>

**Past Intra-mural Support:**

2001	\$ 600, Arts and Sciences Travel Fund, University of Maryland, Baltimore County.
1999	\$ 3,000. Summer Faculty Fellowship, University of Maryland, Baltimore County.
1998	\$ 5,000. Summer Faculty Fellowship, University of Maryland, Baltimore County.
1998	\$ 803. Arts and Sciences Travel Fund, University of Maryland, Baltimore County.

**Teaching Experience****Undergraduate:**

1. Iowa State University:
  - (a) HONS 290: Freshman Honors Project (*2006*)
1. University of Maryland Baltimore County:
  - (a) STAT 121: An Introduction to Statistics for the Social Sciences (*2001*)
  - (b) STAT 350: Statistics for the Biological Sciences (*1998, 1999, 2000, 2001, 2002*)
  - (c) STAT 355: Probability and Statistics for Scientists and Engineers (*1997, 1998*)
  - (d) STAT 433: An Introduction to Statistical Computing (*2003*)
  - (e) STAT 454: Applied Statistics (*2001*)
  - (f) STAT 490: An Introduction to Data Mining (*2001*)

**Graduate:**

1. Iowa State University:
  - (a) STAT 580: Statistical Computing – I (*2005, 2006*)
  - (b) STAT 501: Applied Multivariate Analysis (*2004*)
  - (c) STAT 515: Theory and Applications of Non-linear Models (*2003*)
  - (d) STAT 690E: Advanced Statistical Computing (*2005*)
2. University of Maryland Baltimore County:
  - (a) STAT 601: Applied Statistics – I (*1997, 1998*)
  - (b) STAT 625: Spatial Statistics and Image Analysis (*1998, 2000*)
  - (c) STAT 633: Statistical Computing (*1999, 2002*)

**Ph. D. Students:**

1. William Baumann. Degree Expected: 2008. Chair and Member, Ph. D. Committee.
2. Ivan Ramler. Degree Expected: 2007. Chair and Member, Ph. D. Committee.
3. Rafaela M. Guidi. Degree Awarded: 2003. Chair, Ph. D. Reading Committee.
4. Rhonda DeCook. Degree Expected: 2006. Member, Ph. D. Committee.
5. Yurong Wang. Degree Expected: 2006. Member, Ph. D. Committee.
6. Eric Moulton. Degree Awarded: 2004. Member, Ph. D. Committee.

7. Xiaoming Li. Degree Awarded: 2000. Member, Ph.D. Reading Committee.
8. Xianong Gu. Degree Awarded: 2000. Member, Ph.D. Reading Committee.
9. Yi-Tzu Li. Degree Awarded: 1999. Member, Ph. D. Committee.
10. Vladimir Mats. Degree Awarded: 1997. Member, Ph. D. Committee.

### **M. S. Students:**

1. William Baumann. Degree Expected: 2006. Chair and Member, MS Program of Study Committee.
2. Erin K. McMurtry. Degree Awarded: 2005. Chair and Member, MS Program of Study Committee.
3. Nichole Gray. Degree Awarded: 2005. Chair and Member, MS Program of Study Committee.
4. Peter Hoekstra. Degree Awarded: 2004. Chair and Member, MS Program of Study Committee.

### **Undergraduate Advising:**

1. Participant, 2006 Freshman Honors Mentor Program.
2. 2004 VIGRE Mentor for Ms. Ashley Bennett, Simpson College, Indianola, IA.

### **Professional Activities**

2004	Panelist for reviewing proposals submitted to the Mathematical and Computer Science Panel, National Science Foundation.
2003	Organizer and Chair: Session on MCMC computations for large-dimensional problems, <i>Joint Statistical Meetings 2003, San Francisco</i> .
2002–2003	Chemometrics Program Sub-committee Chair, Section on the Physical and Engineering Sciences, American Statistical Association
2002–2005	Statistical Computing Editor, Statistical Computing and Graphics Newsletter, Section on Statistical Computing, American Statistical Association
2002	Chair: Invited Session on International Environmental Statistics, <i>TIES 2002</i> , The International Environmetrics Society Meetings, Genova, Italy.
2001	Member: Program Committee, Conference on Knowledge Discovery in Databases (KDD).
2001	Chair: Session on Applications of Nonparametrics, <i>2001 Joint Statistical Meetings</i> , Atlanta.
1999	Invited participant: National Research Council (NRC) Workshop on “Statistical Methods for Reducing Uncertainty in Ocean Science Models”, National Academy of Sciences.
1997-2001	Co-Liaison, Continuing Education, Section on Statistical Computing, American Statistical Association
1996 – present	Reviewer for papers submitted to: <i>Biometrics</i> , <i>Computational Statistics and Data Analysis</i> , <i>Journal of the American Statistical Association</i> , <i>Journal of Computational and Graphical Statistics</i> , <i>Journal of Statistical Education</i> , <i>Journal for Statistical Planning and Inference</i> , <i>Statistics and Probability Letters</i> , <i>Mathematical Programming</i> , <i>Naval Research Logistics</i> , <i>Journal of the American Statistical Association</i> , <i>Journal of Environmental Statistics</i> , <i>IEEE Transactions on Medical Imaging</i> , and <i>1996 IEEE Nuclear Science Symposium and Medical Imaging Conference</i>

**University and Community Service:**

2004-2006	Strategic Planning Committee, Department of Statistics, Iowa State University
2003-2005	Computer Advisory Committee, Department of Statistics, Iowa State University
2003-2004	Chair, Seminar Committee, Department of Statistics, Iowa State University
2002-2003	Member, Executive Committee, Section on the Physical and Engineering Sciences, American Statistical Association
2001-2003	Undergraduate Committee, Department of Mathematics and Statistics, University of Maryland, Baltimore County
2000-2002	President, Maryland Chapter, American Statistical Association
1999-2000	Faculty Classroom Instructional Technology Committee, University of Maryland, Baltimore County
1999-2001	Member, Department Computer Committee, Department of Mathematics and Statistics, University of Maryland, Baltimore County
1998-2000	Vice-President, Maryland Chapter, American Statistical Association
1998	Acting Chair, Department Computer Committee, Department of Mathematics and Statistics, University of Maryland, Baltimore County
1997-2005	Executive Committee, Section on Statistical Computing, American Statistical Association
1997 - 2003	Participant, UMBC Graduate School Open House

**References**

1. Siddhartha R. Dalal, Vice-President, (Imaging and Services Technology Center, Xerox Innovation Group), Xerox Corporation, 800 Phillips Road, Mailstop 0128-53E, Webster, NY 14580. *E-mail: Siddhartha.Dalal@xeroxlabs.com*. Phone: (585)-422-7485.
2. William F. Eddy, Professor, Department of Statistics, Carnegie Mellon University, Pittsburgh, PA 15213. *E-mail: bill@stat.cmu.edu*. Phone: (412) 268-2725.
3. Jon R. Kettenring, Fellow of The Charles A. Dana Research Institute for Scientists Emeriti, Drew University, 36 Madison Ave, Madison, NJ 07940 *E-mail: jkettenr@drew.edu*. Phone: (973) 408-3829.
4. Richard Olshen, Chief, Division of Biostatistics, Department of Statistics, Sequoia Hall, Stanford University, Stanford, CA 94305-4065. *E-mail: olshen@stanford.edu*. Phone: (650) 725-2241.
5. Adrian Raftery, Department of Statistics, University of Washington, Box 354322, Seattle, WA 98195-4322. *E-mail: raftery@stat.washington.edu*. Phone: (206) 543-4505.