

Sarat C. Dass
Curriculum Vitae

ADDRESS:

Department of Statistics & Probability
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Research Interests

Statistical Image Analysis, Object Detection and Recognition, Shape Analysis, Spatial Statistics, Bayesian computational methods, Foundations of Statistics, Non-parametric statistical methods.

Education

Ph. D. in Statistics, Purdue University, 1998. Dissertation title : Unified Bayesian and Conditional Frequentist Testing Procedures. Advisor : James O. Berger.
M. S. in Statistics, Purdue University, 1993-1995.
B. Stat. (Hons.), Indian Statistical Institute, Calcutta, India, 1990-1993.

Positions Held

Associate Professor, Department of Statistics & Probability, Michigan State University, 2007-2008.
Assistant Professor, Department of Statistics & Probability, Michigan State University, 2000-2007.
Adjunct Associate Professor, Department of Computer Science & Engineering, Michigan State University, 2004-2008.
Visiting Assistant Professor, Department of Statistics, University of Michigan, 1998-2000.
Research Scholar, Institute of Statistics and Decision Sciences, Duke University, 1997-1998.

Grants and Awards

1. Sarat C. Dass and Anil K. Jain, “*Statistical Methods for Fingerprint Image Analysis*”, National Science Foundation, Statistics Program. Amount: \$200,000. Duration: 09/01/2007 - 08/31/2010.
2. Anil K. Jain and Sarat C. Dass, “*Fingerprints: Deformation, Individuality, Image Quality and Fusion*”, U. S. Army Research Office. Amount: \$225,000.00. Duration: 01/09/06 - 08/31/09.
3. Anil K. Jain and Sarat C. Dass, “*Fingerprint Feature Extraction and Matching*”, National Science Foundation ITR Grant. Duration: 2003-2007. Amount: \$230,000.00.
4. Anil K. Jain and Sarat C. Dass, “*Fingerprint Feature Extraction and Matching*”, REU Supplemental on the National Science Foundation ITR Grant. Amount: \$6,000.00, Duration:

05/12/05 - 08/31/06.

5. Research Support for DoD Multimodal Biometrics by Lockheed Martin on collaborative research efforts by West Virginia University, Michigan State University, St. Lawrence and Clarkson University. Amount: \$250,000.00. Duration: 12/01/04 - 12/13/05.

Scholarships and Honors

Recipient of the Department of Statistics Award for Outstanding Classroom Teaching, Purdue University, 1997.

Recipient of the Frederick N. Andrews Fellowship for Doctoral Studies, Purdue University, 1993-1995, for the School of Science.

Recipient of the ISI Presidential Medal, Indian Statistical Institute, 1993, for securing top marks in the B. Stat. (Hons.) program.

Publication

Journal Publications:

1. Nandakumar, K., Chen, Y., Dass, S. C. and Jain, A. K., "Likelihood Ratio-Based Biometric Score Fusion", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 30, no. 2, pp. 342-347, 2008.
2. Zhu, Y., Dass, S. C., and Jain, A. K., "Statistical Models for Assessing the Individuality of Fingerprints", *IEEE Transactions on Information Forensics and Security*, vol. 2, no. 3, pp. 391-401, 2007.
3. Dass, S. C., Zhu, Y. and Jain, A. K., "Validating a Biometric Authentication System: Sample Size Requirements", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 28, no. 12, pp. 1902-1319, 2006.
4. Ross, A., Dass, S. C. and Jain, A. K., "Fingerprint Warping Using Ridge Curve Correspondences", *IEEE Transactions on PAMI*, vol. 28, no. 1, pp. 19-30, 2006.
5. Dass, S. C., "Markov Random Field Models For Directional Field and Singularity Extraction in Fingerprint Images", *IEEE Transactions on Image Processing*, vol. 13, no. 10, pp. 1358 - 1367, 2004.
6. Ross, A., Dass, S. C. and Jain, A. K., "A Deformable Model for Fingerprint Matching", *Pattern Recognition*, vol. 38, no. 1, pp. 95-103, 2005.
7. S. C. Dass and V. N. Nair, "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Data", *Journal of the American Statistical Association*, vol. 98, no. 461, pp. 77 - 89, 2003.
8. S. C. Dass and J. O. Berger, "Unified Bayesian and Conditional Frequentist Testing Procedures for Composite Hypotheses", *Scandinavian Journal of Statistics*, vol. 30, no. 1, pp. 193 - 210, 2003.
9. S. C. Dass and J. Lee, "A Note on the Consistency of Bayes Factors for Testing Point Null versus Nonparametric Alternatives", *Journal of Statistical Planning and Inference*, vol. 119, no. 1, pp. 143 - 152, 2003.

10. Dass, S. C., "Propriety of Intrinsic Priors in Invariant Testing Situations", *Journal of Statistical Planning and Inference*, vol. 92, no. 1-2, pp. 147-162, 2001.
11. S. C. Dass, "Unified Bayesian and Conditional Frequentist Testing Procedures for Discrete Distributions", *Sankhya Ser. B*, vol. 63, no. 3, pp. 251-269, 2001.

Peer Reviewed Conference Proceedings:

1. Zhu, Y., Dass, S. C., and Jain, A. K., "Compound Stochastic Models for Fingerprint Individuality", *Proc. of International Conference on Pattern Recognition (ICPR)*, Hong Kong, August 20-24, 2006.
2. Nandakumar, K., Chen, Y., Dass, S. C., and Jain, A. K., "Quality-based Score Level Fusion in Multibiometric Systems", *Proc. of International Conference on Pattern Recognition (ICPR)*, Hong Kong, August 20-24, 2006.
3. Chen, Y., Dass, S. C. and Jain, A. K., "Localized Iris Image Quality Using 2-D Wavelets", *Proc. of International Conference on Biometrics (ICB)*, pp. 373-381, Hong Kong, January, 2006.
4. Chen, Y., Dass, S. C. and Jain, A. K., "Fingerprint Quality Indices for Predicting Authentication Performance", *Proc. of Audio- and Video-based Biometric Person Authentication (AVBPA)*, 2005, pp. 160-170, Rye Brook, NY, July 2005.
5. Dass, S. C., Nandakumar, K. and Jain, A. K., "A Principled Approach to Score Level Fusion in Multimodal Biometric Systems", *Proc. of Audio- and Video-based Biometric Person Authentication (AVBPA)*, 2005, pp. 1049-1058, Rye Brook, NY, July 2005.
6. Dass, S. C. and Jain, A. K., "Effects of User Correlation on Sample Size Requirements", *Proc. of the SPIE Defense and Security Symposium*, Orlando, FL, 2005.
7. Lu, X., Jain, A. K., and Dass, S. C., "3D Facial Expression Modelling for Recognition", *Proc. of the SPIE Defense and Security Symposium*, Orlando, FL, 2005.
8. Chen, Y., Dass, S. C., Ross, A. and Jain, A. K., "Fingerprint Deformation Models Using Minutiae Location and Orientation", *Workshop on the Applications of Computer Vision (WACV)*, Colorado, 2005.
9. Ross, A., Dass, S. C. and Jain, A. K., "Estimating Fingerprint Deformation", *Proc. International Conference on Biometric Authentication (ICBA)*, Hong Kong, July 2004.
10. Nandakumar, K., Dass, S. C. and Jain, A. K., "Utilizing Soft Biometric Traits in Personal Recognition Systems", *Proc. International Conference on Biometric Authentication (ICBA)*, Hong Kong, July 2004.
11. Jain, A. K., Dass, S. C., and Nandakumar, K. "Can Soft Biometric Traits Assist User Recognition", *Proc. of SPIE Vol. 5404, Biometric Technology for Human Identification*, pp. 561-572, Orlando, FL, April 2004.
12. Dass, S. C. and Jain, A. K., "Fingerprint Classification Using Orientation Field Flow Curves", *The 4th Indian Conference on Computer Vision, Graphics and Image Processing*, Kolkata, December 16-18, 2004.
13. S. C. Dass, A. K. Jain and X. Lu, "Face Detection And Synthesis Using Markov Random Field Models", *Proc. International Conference on Pattern Recognition*, Quebec City, August

11-15, pp 680-687, 2002.

14. S. C. Dass and A. K. Jain, "Markov Face Models", *The Eight IEEE International Conference on Computer Vision*, Vancouver, July 9-12, pp 680-687, 2001.

Ph. D. Students:

1. Yongfang Zhu, Department of Statistics and Probability.
2. Wenmei Huang, Department of Statistics and Probability.

Departmental Responsibilities and Committee Work:

1. Graduate Student Co-ordinator, Department of Statistics & Probability, 2007-2008.
2. Graduate Support Committee, Department of Statistics & Probability, 2007-2008.
3. Ph. D. Qualifying Examination Committee, Department of Statistics & Probability, 2006-2008.
4. Thesis committee member for Ph. D. students working in the Pattern Recognition and Image Processing (PRIP) Lab in the Department of Computer Science and Engineering. Current students include Pavan Kumar Mallapragada, Meltem Dermikus, Abhishek Nagar, Karthik Nandakumar, Unsang Park, Yongfang Zhu, and Yi Chen.
5. Member of the Faculty Advisory Council, College of Natural Sciences, 2002-2004.

Professional Affiliations:

1. Member of the IEEE Computer Society.
2. Member of the American Statistical Association.

Talks and Presentations:

1. "Markov Random Field Models for Directional Field Estimation and Singularity Extraction in Fingerprint Images", International Conference on Statistical Paradigms - Recent Advances and Reconciliations (ICSPRAR), Kolkata, India, January 01-04, 2008.
2. "Statistical Models for Assessing the Individuality of Fingerprints", Workshop on Biometrics, Institute for Mathematical Stochastics, University of Goettingen, Germany, Sept. 2007.
3. Gave lectures on various aspects of fingerprint-based biometric authentication at the Institute for Mathematical Stochastics, University of Goettingen, Germany, from May 12th - June 12th, 2005.
4. "Statistical Models for Feature Extraction and Matching in Fingerprint Images", Indian Statistical Institute, Kolkata, January, 2005.
5. "Point Process Models on Minutiae Features for Assessing Fingerprint Individuality", International Conference on Forensic Sciences, Arizona State University, March, 2005.
6. "Effects of User Correlation on Sample Size Requirements", SPIE, Orlando, March, 2005.
7. "Validating a Biometric Authentication System: Sample Size Requirements", Biometric Consortium Conference, Crystal City, Virginia, 2004.
8. "Some Aspects of Fingerprint Based Authentication Systems", Department of Statistics and Probability, September, 2004.

9. "Fingerprint Classification Using Orientation Field Flow Curves", The 4th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), Kolkata, December, 2004.
10. "Utilizing Soft Biometric Traits in Personal Identification Systems", Center for Identification Technology Research (CiTeR), November, 2003.
11. "Warping Models for Fingerprint Images", Department of Statistics and Probability Colloquium, September, 2003.
12. "Obtaining Smooth Directional Field Estimates for Fingerprint Images", Interface 2003, Salt Lake City. March, 2003.
13. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", Department of Statistics Colloquium, Purdue University, October, 2002.
14. "Face Detection and Synthesis using Markov Random Field Models", International Conference on Pattern Recognition (ICPR '02), Quebec City. August, 2002.
15. "Markov Face Models", Interface 2002, Montreal. April, 2002.
16. "Markov Models for Face Detection", International Indian Statistical Association Conference, Dekalb, IL. June, 2002.
17. "Markov Models for Face Detection", Joint Statistical Meeting, ASA, Atlanta, Georgia, 2001.
18. "Markov Face Models", International Conference on Computer Vision, Vancouver, 2001.
19. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", EAPRC Bernoulli Society, Kuala Lumpur, Malaysia, 2001.
20. "Identifying Operating Characteristics that Influence the Mean and Variance of Powder Coating Thickness on Metal Sheets: A Bayesian Approach", Conference on Reliability, University of Pune, Pune, India, 2001.
21. "On the Propriety of Intrinsic Priors in Invariant Testing Situations", Workshop on Objective Bayesian Methodology, Ixtapa, Mexico, 2000.
22. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", Department of Mathematics Colloquium, McGill University, Montreal, Canada, 2000.
23. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", Department of Statistics and Probability Colloquium, Michigan State University, 2000.
24. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", Department of Mathematics Colloquium, University of Cincinnati, 2000.
25. "Edge Detection, Spatial Smoothing and Image Reconstruction with Partially Observed Multivariate Data", Department of Mathematics Colloquium, University of Missouri, Rolla, 2000.
26. "Unified Conditional Frequentist and Bayesian Testing Procedures", Department of Statistics Colloquium, University of Michigan, 1998.
27. "Unified Conditional Frequentist and Bayesian Testing Procedures", Department of Statistics Colloquium, University of Wisconsin-Madison, 1998.
28. "Unified Conditional Frequentist and Bayesian Testing Procedures", Graduate Student Seminar, Duke University, 1998.

29. “Unified Conditional Frequentist and Bayesian Testing Procedures”, Graduate Student Seminar, Purdue University, 1996.

Refereeing Responsibilities:

Served as a reviewer for grant applications for the following agencies: NSF and NSA.

Served as a referee for journals including:

1. Sankhya, Journal of the Indian Statistical Institute
2. The Annals of Statistics
3. The IEEE Trans. on Pattern Analysis and Machine Intelligence
4. Journal of Business Economics and Statistics
5. The IEEE Transactions on Signal Processing
6. The IEEE Transactions on Image Processing
7. The IEEE Transactions on Information Forensics and Security
8. Journal of Multivariate Analysis
9. Signal Processing Letters

Served as a reviewer for articles submitted to peer-reviewed conferences.

Courses Taught:

Michigan State University, 2000-2008

Taught a mixture of large- and moderate-sized undergraduate course and graduate courses in Statistics. Course descriptions are as follows:

1. STT 200 “Statistical Methods”.
2. STT 201 “Statistical Methods”.
3. STT 231 “Statistics for Scientists”.
4. STT 315 “Introduction to Probability and Statistics for Business”.
5. STT 430 “Introduction to Probability and Statistics”.
6. STT 441 “Probability and Statistics I: Probability”.
7. STT 461 “Introduction to Statistical Computing”.
8. STT 865 “Modern Statistical Methods”.
9. STT 890 “Topics in Survival Analysis”.

University of Michigan, 1998-2000

1. STAT 100 “Introduction to Statistical Reasoning”.
2. STAT 470 “Introduction to Designs of Experiments”.

Statistical Consulting:

Developed and conducted workshops for the Statistical Consulting Service at Michigan State

University on Bayesian MCMC simulation and computational techniques.