ABHISHEK BHATTACHARYA

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EDUCATION LEVEL

Bachelor of Statistics (B.Stat.Hons.), Indian Statistical Institute, 1999-2002.

Master of Statistics (M.Stat.Hons.), Indian Statistical Institute, 2002-2004.
Master's Project: **Bootstrap in Time Series Models**, Project supervisor: Prof. Arup Bose.

Doctor of Philosophy (Ph.D.), Department of Mathematics, University of Arizona, 2004-2008.
PhD Thesis: **Nonparametric Statistics On Manifolds With Applications To Shape Spaces**, Thesis advisor: Prof. Rabi Bhattacharya.

Presently working as a Postdoctoral Associate at the Department of Statistical Science, Duke University under the mentorship of Prof. David Dunson.
Postdoc project: **Bayesian nonparametrics on Riemannian manifolds and spaces of shapes**

2009 Postdoc Evaluation form

RESEARCH AREAS

Statistics on Shape Spaces & Non-Euclidean Manifolds, Nonparametric Bayes Theory, Asymptotic Statistics, Bootstrapping Techniques, Nonparametric Regression and Classification on Manifolds, Manifold Learning.

PUBLICATIONS

(in reverse chronological order)

1. **Nonparametric Bayesian Density Estimation on Manifolds with Applications to Planar Shapes** (with Prof. David Dunson). *Biometrika* (2010). In Press.

2. **Strong Consistency of Nonparametric Bayes Density Estimation on Compact Metric Spaces** (with Prof. David Dunson). *Annals of the Institute of Statistical Mathematics*. Submitted (2010).

3. **Nonparametric Bayes Classification and Testing on Manifolds with Applications on Hypersphere** (with Prof. David Dunson). *Journal of the Royal Statistical Society Series B*. Submitted (2010).

4. **Nonparametric Bayes regression and classification through mixtures of product kernels (with discussion)** (with Prof. David Dunson). *Bayesian Statistics* **9** (2010). In Press.

5. *Nonparametric Statistics On Manifolds With Applications To Shape Spaces* (with Prof. Rabi Bhattacharya). To appear as **IMS Monograph** (expected in 2010).

6. **Statistical Analysis on Manifolds: A Nonparametric Approach for Inference on Shape Spaces**. *Sankhya: The Indian Journal of Statistics* Volume **70**, Part **3** (2008) 0-43.

7. **Statistics on Manifolds with Applications to Shape Spaces** (with Professor R. Bhattacharya). *Perspectives in Mathematical Sciences I: Probability and Mathematics* (2009). Indian Statistical Institute, Bangalore. 41-70.

8. **Nonparametric Statistics on Manifolds with Applications to Shape Spaces** (with Professor R. Bhattacharya). *Pushing the Limits of Contemporary Statistics: Contributions in honor of J.K. Ghosh*. IMS Collections **3** (2008) 282-301.

9. **Statistics on Riemannian Manifolds: Asymptotic Distribution and Curvature** (with Professor R. Bhattacharya). *Proceedings of the American Mathematical Society* 136 (2008) 2959-2967.

10. **Nonparametric Inference on Shape Spaces**. *JSM Proceedings: Section on Nonparametric Statistics* (2008).

11. **Statistics on Placenta Shapes**. (2007) Unpublished manuscript.

12. **Bootstrap in Time Series Models**. (2004) Unpublished report.

RECENT CONFERENCES/WORKSHOPS ATTENDED

(in chronological order)

1. Participated in the Summer Research Fellowship Programme of the Jawaharlal Nehru Centre for Advanced Scientific Research, India in 2001 and did a project using Randomized Response Techniques in Sample Surveys.

2. Participated in the Visiting Students' Research Programme held at Tata Institute of Fundamental Research, India during May 15 to June 16, 2002.

3. Attended the 21^{st} Annual Workshop on Mathematical Problems in Industry held at Worcester Polytechnic Institute, Massachusetts from June 13-17, 2005.

4. Attended the 5^{th} Annual Red Raider Mini-Symposium held at Texas Tech University, Nov 17-19, 2005 and presented a poster on **Bootstrap in Time Series Models**.

5. Participated as a speaker in the IMS Annual Meeting, held at IMPA, Rio de Janeiro, from July 30 to August 4, 2006.

6. Participated as a speaker in the MSRI workshop titled "Workshop on Topological Methods in Combinatorics, Computational Geometry, and the Study of Algorithms" held from October 02 to October 06, 2006.

7. Attended the 2007 Data Sciences Summer School at Los Alamos National Labs, from June 24 to August 24, 2007, and did a project under Dr. K. R. Vixie.

8. Attended the 2007 Nonparametric Statistics Conference on Current and Future Trends in Nonparametrics, held at the University of South Carolina in Columbia, South Carolina October 11-12, 2007 and presented a poster titled **Statistics on Placenta Shapes**.

9. Presented a poster on **Nonparametric Analysis of Shapes with Applications to Morpometrics and Medical Diagnostics** at the 2007 AHSC Frontiers in Biomedical Research Poster Forum held on October 17, 2007 at AHSC Plaza, University of Arizona.

10. Attended the 2008 Spring CAM Conference on Emerging Directions in Probability and Statistics, held at the University of Notre Dame February 29 - March 2, 2008.

11. Attended the 2008 Industrial Mathematical and Statistical Modeling Workshop for Graduate Students held from July 21-29, 2008 at North Carolina State University and worked on a project titled **Cardiovascular events associated with Oral and IV-administered antibacterial agents**.

12. Participated as a speaker in the 2008 Joint Statistical Meetings held at Denver, Colorado from August 3-7, 2008 and gave a talk titled **Nonparametric Inference on Shape Spaces**.

13. Attended the Seventh Workshop on Bayesian Nonparametrics held in Moncalieri,Italy from June 21-25, 2009 and presented a poster titled **Nonparametric Bayesian Inference on Planar Shapes**

14. Invited to give a talk at the Statistics GIDP Colloquium, University of Arizona. March 29, 2010.

15. Participated as a speaker in the 24th New England Statistics Symposium held at Harvard University on April 17, 2010 and gave a talk titled **Nonparametric Bayes Modelling on Manifolds**.

16. Invited to speak at the 2010 Summer Research Conference of the Southern Regional Council on Statistics (SRCOS) held in Norfolk, VA, June 6-9, 2010.

RECENT PROJECTS, PAPERS & PRESENTATIONS

(in reverse chronological order)

1. **Nonparametric Bayes Inference on Manifolds with Applications on Hyperspheres and Shape Spaces**. Talk at SRCOS 2010. June 7, 2010.

2. **Nonparametric Bayes Modelling on Manifolds**. Presentation at the 24th New England Statistics Symposium. April 17, 2010.

3. **Nonparametric Bayes Inference on Manifolds with Applications to Hypersphere and Shape Spaces**. Presentation at University of Arizona. March 29, 2010.

4. **Nonparametric Bayesian Inference on Manifolds with application to the Sphere and Shape Spaces**. Talk at Duke University on Jan 13 2010.

5. **Nonparametric Bayesian Inference on Planar Shapes**. Poster presented at the Seventh Workshop on Bayesian Nonparametrics. June 23, 2009.

6. PhD Thesis Defense: **Nonparametric Statistics On Manifolds With Applications To Shape Spaces**, November 24, 2008.

7. **2008 Joint Statistical Meeting Presentation.** Gave a talk on **Nonparametric Inference on Shape Spaces**, August 07, 2008.

8. **2008 Industrial Mathematical and Statistical Modeling Workshop Project.** Project Report: **Cardiovascular events associated with Oral and IV-administered antibacterial agents**

9. **2007 AHSC Frontiers in Biomedical Research Poster Forum presentation.** Poster on **Nonparametric Analysis of Shapes with Applications to Morpometrics and Medical Diagnostics**.

10. **2007 Nonparametric Statistics Conference presentation.** Poster on **Statistics on Placenta Shapes**.

11. **MSRI Workshop Presentation.** Gave a talk on **Statistics on the Planer Shape Space**, October 06, 2006.

12. **IMS Annual Meeting Paper.** Presented a paper titled **Intrinsic Mean on Manifolds**, July 31, 2006.

13. **Spatiotemporal Data Analysis Workshop Project.** Did a project to study if there is a bidecadal oscillation in global surface air temparatures. Project report: **Oscillations and Warming Trend in Global Temperature time series**. Project supervisor: Professor Michael Evans, Fall 2006.

14. **Comprehensive Exam project.** Presented an article on **Statistics on Riemannian Manifolds with applications to the Planer Shape Space**, Project Advisor: Professor R. Bhattacharya, Fall 2006.

15. **Research Tutorial Group Project.** Presented a paper on various notions of centers of arbitrary manifolds and their properties. Presentation: **Statistics on Manifolds: Frechet means and their estimation**, Project supervisor: Professor R. Bhattacharya, Fall 2005.

HONOURS & AWARDS

1. Received a BNP Travel Award to attend the the Seventh Workshop on Bayesian Nonparametrics held in Moncalieri, Italy from June 21-25, 2009.

2. Awarded for Outstanding Research in Mathematics in 2008 from the Department of Mathematics, University of Arizona and nominated for a College of Science award in the same category.

3. Awarded Graduate College Fellowship and Graduate Incentives for Growth Award (GIGA) fellowship for Spring 2008 semester at University of Arizona.

4. Selected to receive reimbursement from the 2007 Nonparametric Statistics Conference Organizing Committee to attend the conference.

5. Awarded financial support to attend the 2007 Data Sciences Summer School at Los Alamos National Labs.

6. Selected to receive a Mathematical Sciences Research Institute funding to participate in the workshop on Topological Methods in Combinatorics, Computational Geometry, and the Study of Algorithms, 2006.

7. Selected to receive reimbursement from the National Science Foundation to attend the 2006 IMS Annual Meeting.
8. Selected to receive the Institute of Mathematical Statistics Laha Travel Award to attend the IMS Annual Meeting, 2006.
9. Awarded scholarships for good performance in various semesters at Indian Statistical Institute.

TEACHING EXPERIENCE

Worked as Graduate Teaching Assistant at University of Arizona from Aug 2004 to Dec 2008.

Courses Taught

MATH 110: College Algebra (**Fall 2005**, **Spring 2006**), MATH 160: Basic Statistics (**Spring 2007**, **Fall 2008**), **MATH 120**: Calculus Preparation (Fall 2007), **MATH 113**: Elements of Calculus (Summer 2008).

Recitals

MATH 254: Differential Equations (Fall 2006)
Helped the students with their homework assignments and conducted review tests in weekly recital sessions.

Super TA

MATH 523: Real Analysis (Fall 2006) Assisted in the instruction of graduate course of Analysis by holding weekly problem sessions.
Math 425: Mathematical Analysis (Spring 2007) Assisted the Professor in teaching the course.
MATH 534: Topology-Geometry (Fall 2007) Assisted in the instruction of the graduate course by holding weekly problem sessions.

Participated in the U of A Integration Workshop, 2006 as a senior graduate student. Helped to integrate incoming graduate students into the graduate math program.

References

1. Professor Rabi Bhattacharya. Department of Mathematics, The University of Arizona, Tucson, AZ 85750, U.S.A.

2. Professor David Dunson. Department of Statistical Sciences, Duke University, Durham, NC 27708, U.S.A.

3. Professor Douglas Ulmer. Professor and Chair of School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332, U.S.A.

Signed: _____ Date: 08/01/2010
ABHISHEK BHATTACHARYA