

# SUBHADEEP (DEEP) MUKHOPADHYAY

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## EDUCATION

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- Texas A&M University** Aug 2008 – May 2013  
*Ph.D.*, Department of Statistics  
Advisors: Prof. Emanuel Parzen and Prof. S.N.Lahiri.  
Dissertation Topic: Nonparametric Inference for High Dimensional Data.
- Indian Institute of Technology (IIT), Kanpur** Aug 2006 – June 2008  
*Master's of Statistics*, Department of Mathematics & Statistics  
Graduating GPA 9.9/10.0 , University Rank : 1. Awarded **Gold Medal**.  
Specialization: Statistics and Machine Learning.
- University of Calcutta** Aug 2003 – June 2006  
*Bachelor of Statistics*, Department of Statistics  
University Rank : 9. Awarded **National Scholarship** from the University of Calcutta.  
Major: Statistics; Minor: Mathematics and Computer Science.

## MAJOR RESEARCH INTERESTS

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Nonparametric Data Science; United Statistical Algorithms.

## PROFESSIONAL POSITIONS

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- Assistant Professor, Dept of Statistics, Fox School of Business, Temple University Aug 2013 – present
- Affiliate Faculty, Center for High-Dimensional Statistics
  - Affiliate Faculty, The Data Science Institute

## SELECTED HONORS & AWARDS

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- Best Paper Award, JSM ASA Section on Nonparametric Statistics 2016
- Best Paper Award, JSM ASA Section on Statistical Computing 2016
- Winner of IEEE International Biometric Eye Movements Verification Competition 2014
- Emanuel Parzen Graduate Research Fellowship Award, Texas A&M University 2012
- Best Poster and Presentation, by Google at SIAM International Conference on Data Mining 2011
- Best Student Paper, IISA Conference on Probability, Statistics & Data Analysis, NCSU 2011
- Best Paper Award, JSM ASA Section on Nonparametric Statistics 2010
- Sangeeta Pradhan Memorial Gold Medal: Outstanding all-round achievement among *all disciplines* of the Master of Science Programs in IIT Kanpur 2008
- N. Balakrishnan Award of Statistics and Director Medal, IIT Kanpur 2008
- Prof. J N Kapur Prize for Mathematical Excellence in undergraduate study in IIT Kanpur 2008

## TEACHING

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<b>Undergraduate Courses</b>	Temple University
· STAT 2501, Quantitative Foundations for Data Science ( <i>newly</i> developed course)	Spring, Fall 2018, 2017
· STAT 2103, Statistical Business Analytics	Spring 2014, 2015, 2017
<b>Graduate Courses</b>	Temple University
· STAT 8001, Probability & Stat Theory I	Fall 2013, 2014, 2018
· STAT 8002, Probability & Stat Theory II	Spring 2014, 2015
· STAT 8115: Nonparametric Methods ( <i>newly</i> redesigned course)	Fall 2016
· STAT 9190, Nonparametric Data Science ( <i>newly</i> developed special topics course)	Spring 2018, 2016

## PUBLICATIONS

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### Refereed Journal Publications [\* indicates Temple student author]

1. Bruce, S.\*, Li, Z\*., Yang, H\*., and **Mukhopadhyay, S.** (2019). Nonparametric Distributed Learning Framework: Algorithm and Application to Variable Selection. *IEEE Transactions on Big Data* (forthcoming), link: <http://ieeexplore.ieee.org/document/8303780/>.
2. **Mukhopadhyay, S.** and Fletcher, D\* (2018) Generalized Empirical Bayes Modeling via Frequentist Goodness-of-Fit. *Nature Scientific Reports*, **8**, 1–15.
3. **Mukhopadhyay, S.** (2018) Decentralized Nonparametric Multiple Testing. *Journal of Nonparametric Statistics*, **30**, 1003–1015.
4. **Mukhopadhyay, S.** and Parzen, E. (2018) Nonlinear Time Series Modeling: A Unified Perspective, Algorithm and Application. *J. Risk and Financial Management*, Special Issue on “Applied Econometrics”, **11**, 1–17.
5. **Mukhopadhyay, S.** and Nandi, S\* (2017) LPiTrack: Eye Movement Pattern Recognition Algorithm and Application to Biometric Identification. *Machine Learning Journal*, **107**, 313–331.
6. **Mukhopadhyay, S.** (2017) Large-Scale Mode Identification and Data-Driven Sciences. *Electronic Journal of Statistics*, **11** 215–240.
7. **Mukhopadhyay, S.** (2016) Large-Scale Signal Detection: A Unifying View. *Biometrics*, **72** 325–334.
8. Parzen, E. and **Mukhopadhyay, S.** (2013) United Statistical Algorithms, LP comoment, Copula Density, Nonparametric Modeling. *59th ISI World Statistics Congress (WSC), Hong Kong*.
9. Lahiri, S. N. and **Mukhopadhyay, S.** (2012) On the Mahalanobis-distance based Penalized Empirical Likelihood Method in High Dimensions. *Statistics and Its Interface*, **5**, 331–338.
10. Lahiri, S. N., and **Mukhopadhyay, S.** (2012). A Penalized Empirical Likelihood Method in High Dimensions. *Annals of Statistics*, **40** 2511–2540.
11. **Mukhopadhyay, S.**, Parzen, E. and Lahiri, S.N. (2012) From Data to Constraints. *Bayesian Inference And Maximum Entropy Methods In Science And Engineering: 31st International Workshop, Waterloo*, **1443**, 32–39.
12. **Mukhopadhyay, S.** and Ghosh, A.K. (2011) Ensemble Methods for Supervised and Semi-supervised Classification Using Kernel Density Estimates. *Computational Statistics & Data Analysis*, **55** 2344–2353.

13. **Mukhopadhyay, S.** and Liang, F. (2009) Bayesian Analysis of High Dimensional Classification. *Bayesian Inference And Maximum Entropy Methods In Science And Engineering: 29th International Workshop, Oxford*, **1193**, 243-250.

**Under Revision** [\* indicates Temple student author]

14. **Mukhopadhyay, S.** and Wang, K\*. (2019) Spectral Graph Analysis: A Unified Explanation and Modern Perspectives. *Nature Scientific Reports*, arXiv:1901.07090, 1–17.
15. **Mukhopadhyay, S.** and Wang, K\*. (2019) A Nonparametric Approach to High-dimensional K-sample Comparison Problem. *Biometrika*, arXiv:1810.01724, 1–20.
16. **Mukhopadhyay, S.** and Parzen, E. (2019) Nonparametric universal copula modeling. *Applied Stochastic Models in Business and Industry*, Special Issue on “Statistics and Data Science”, 1–15.

**Invited Scholarly Articles**

17. **Mukhopadhyay, S.** (2017) Statistics Educational Challenge in the 21st Century. *Biostatistics and Biometrics*, **2**(2): 555585.
18. **Mukhopadhyay, S.** (2016) Invited Review of “Analysis of Multivariate and High-Dimensional Data,” *Journal of the American Statistical Association*, **10** 1321.
19. Parzen, E. and **Mukhopadhyay, S.** (2012) Invited discussion of “Probabilistic Index Models” by Olivier Thas et al, *Journal of Royal Statistical Society, Series B*, **74**.
20. Lahiri, S.N. and **Mukhopadhyay, S.** (2011) Invited discussion of Subsampling weakly dependent time series and application to extremes by Doukhan et al. *TEST*, **20**.

**Submitted/Work in Progress**

1. **Mukhopadhyay, S.** United Statistical Algorithms and Data Science: An introduction to the principles.
2. **Mukhopadhyay, S.** Structured Big Distributions: Model, Compression, and Inference.
3. **Mukhopadhyay, S.** and Fletcher, D\* Inference and Discovery from Uncertain Data.
4. **Mukhopadhyay, S.** and Fletcher, D\* The V-Paradox of Big Data: A Cautionary Note.
5. **Mukhopadhyay, S.** and Wang, K\*. Heterogeneity, Relevance, and Customized-Inference.

**SOFTWARE**

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1. **Mukhopadhyay, S.** and Fletcher, D\* (2018). BayesGOF: Bayesian Modeling via Frequentist Goodness-of-Fit. *R package version 5.3*.
2. **Mukhopadhyay, S.** and Wang, K\*. (2018). LPKsample: LP Nonparametric High Dimensional K-Sample Comparison. *R package version 2.0*.  
**Mukhopadhyay, S.** and Wang, K\*. (2018). LPGraph: Nonparametric Smoothing of Laplacian Graph Spectra. *R package version 2.0*.
3. **Mukhopadhyay, S.** and Nandi, S\* (2015). LPTime: LP Nonparametric Approach to NonGaussian Non-Linear Time Series Modelling. *R package version 1.0-2*.

## PHD ADVISING

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- Past Ph.D. Student: Doug Fletcher (Currently at Army Cyber Institute, West Point, NY)
- Currently Advising: Kaijun Wang (anticipated graduation: 2020).

## STUDENT MENTORING

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- Ph.D. Students: Chen Chen, Scott Bruce, Zeda Li, Shinjini Nandi.
- Master's student: Tanmay Khole, Yu Tian, Fengzheng Zhu, Alex Hsiang-Chieh Yang.
- Undergraduate Students: Brendan Garrett, Maksym Tsisyk, Rahul Nimmagadda, Jonathan Huynh.

## PROFESSIONAL SERVICE

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### Professional Memberships

American Statistical Association (ASA)	2012 – Present
Institute of Mathematical Statistics (IMS)	2013 – Present
International Indian Statistical Association (IISA)	2012 – Present
Institute of Electrical and Electronics Engineers (IEEE)	2017 – Present

### University Service

• Committee Member, The Data Science Institute.	2014 – Present
• Evaluations committee of the Annual PhD Program School-Wide Research Competition	2014– 2015
• Presentation at Young Scholars Interdisciplinary Forum	2015
• Judge, 4th Annual Doctoral Programs School-Wide Research Competition	2014
• Judge, 16th Young Scholars Interdisciplinary Forum	2018
• Attendee, The 8th Semi-Annual Fox School Young Scholars Interdisciplinary Forum	2014

### Departmental Service

• Graduate Affairs Committee	2013 – Present
• New M.S. in Statistics Program Committee	2013 – Present
• Ph.D. Statistics Qualifying Exam Committee	2013 – Present
• Ph.D. Student Admission Committee	2014 – 2016
• Curriculum design Committee, Undergraduate Program in Statistical Science and Data Analytics	2016

### Referee Service

Journal of the American Statistical Association (Theory and Methods); Biometrics; Electronic Journal of Statistics; PLOS Computational Biology; The American Statistician; Journal of Statistical Planning and Inference; Statistics and Probability Letters; Statistica Sinica; Postdoctoral Grant Application to Research Foundation Flanders (Fonds Wetenschappelijk Onderzoek Vlaanderen FWO); NSA Mathematical Sciences Grant Program.

### Book Review

*Analysis of Multivariate and High-Dimensional Data* by Inge Koch, Cambridge University Press.

## OTHER PROFESSIONAL EXPERIENCE

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**Siemens Medical Solutions**  
*Machine Learning Group*

May – August, 2010  
*Malvern, PA, USA*

*Project:* Learning loop for cloud based computer-aided diagnosis.

*Tools:* Developing novel nonparametric classification algorithms with built-in variable selection facility, learning from soft uncertain labels and tie it with active sequential learning loop, bootstrap sensitivity and uncertainty assessment of CADe system.

*Patent:* Active Learning for Model Selection, *Invention Disclosure* 2010.

## INVITED PRESENTATIONS

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- Ecole polytechnique, Center for Applied Mathematics, France 06-2018
- Ghent University, Adolphe Quetelet Lecture, Belgium 06-2018
- Stanford University, Department of Statistics. 05-2018
- Fifth Bayesian, Fiducial, and Frequentist (BFF5) Conference, Ann Arbor, MI. 05-2018
- Rutgers University, Department of Statistics 04-2018
- University Of Pennsylvania, Department of Biostatistics, Epidemiology and Informatics 11-2017
- Full day short course at 61st annual Fall Technical Conference (FTC), Philadelphia. 10-2017
- University of Maryland, Department of Mathematics & Statistics. 09-2017
- Parzen Memorial Lecture, Joint Statistical Meetings Baltimore, Maryland 08-2017
- 17th ASMDA, De Morgan House of the London Mathematical Society, UK. 06-2017
- Parzen Memorial Lecture, Corvallis, Oregon. 08-2016
- JSM Nonparametric Statistics Section, Chicago, Illinois. 08-2016
- International Society for NonParametric Statistics (ISNPS) Conference, Avignon, France. 06-2016
- Graph Signal Processing Workshop, University of Pennsylvania. 05-2016
- Princeton University, John W. Tukey 100th Birthday Celebration. 09-2015
- Indian Statistical Institute (Statistics and Mathematics Unit ), Calcutta, India 08-2014
- ISNPS (International Society of NonParametric Statistics) Conference, Cadiz, Spain 06-2014
- Conference on Nonparametric Dependence Modeling, Columbia University, NYC 05-2014
- Big Data Prediction and Analytics section, Conference on Statistical Practice, Tampa, FL 02-2014
- Penn State University, Department of Statistics 01-2013
- Merck Research Laboratories, Rahway, NJ 06-2012
- Harvard School of Public Health, Boston, MA 05-2012
- Michigan State University, Department of Statistics 04-2012
- Bell Laboratories, Statistics and Learning Research Department, Alcatel-Lucent 01-2012