

# Dootika Vats

## Curriculum Vitae

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### Academic Positions

- June 2017 - **NSF Postdoctoral Fellow**, *Department of Statistics, University of Warwick*,  
Present Mentor: Prof. Gareth Roberts.
- Mar 2017 - **Postdoctoral Research Associate**, *Department of Statistics, University of Warwick*,  
May 2017 Project: "Intractable Likelihood: New Challenges from Modern Applications (i-like)".

### Education

- Feb 2017 **PhD, Statistics**, *The University of Minnesota, Twin-Cities, MN*.  
Advisor: Prof. Galin Jones
- Nov 2016 **MS, Statistics**, *The University of Minnesota, Twin-Cities, MN*.
- May 2012 **MS, Statistics**, *Rutgers University, New Brunswick, NJ*.
- May 2010 **BA(honors), Mathematics**, *University of Delhi, Lady Shri Ram College, India*.

### Research Interests

Markov chain Monte Carlo, Computational Complexity, Bayesian Computation, Covariance Matrix Estimation, Bayesian Variable Selection, Intractable Likelihood Problems, Bernoulli Factories

### Publications

**Vats, D.**, Flegal, J.M., Jones, G.L., Multivariate Output Analysis for Markov Chain Monte Carlo, *Biometrika*, to appear.

Winner, 2016 ASA SBSS Student Paper Award

**Vats, D.**, Flegal, J.M., Jones, G.L., (2018) Strong Consistency of Multivariate Spectral Variance Estimators in Markov Chain Monte Carlo, *Bernoulli*, 24:1860-1909.

**Vats, D.**, (2017) Geometric Ergodicity of Gibbs Samplers in Bayesian Penalized Regression Models, *Electronic Journal of Statistics*, 11 (2) 4033-4064.

#### Preprints

**Vats, D.**, Flegal, J.M., Lugsail Lag Windows and their Application to MCMC, arXiv.

**Vats, D.**, Andrieu, C., Multivariate Ordering of Markov Chains.

### R Software

Maintainer `mcmcse`, Flegal, J.M., Hughes, J., **Vats, D.**, Dai, N..

## Presentations

### Invited Talks

*“Lugsail Lag Windows and their Application to MCMC”*

- Department of Mathematics, IISc Bangalore (Oct 2018, Bengaluru, India)
- Department of Mathematics and Statistics, IIT Kanpur (Sep 2018, Kanpur, India)
- Department of Mathematics, IIT Delhi (Sep 2018, Delhi, India)
- Department of Mathematics, IIT Bombay (Sep 2018, Mumbai, India)
- Department of Mathematics and Statistics, University of Lancaster (Sep 2018, Lancaster, UK)

*“Multivariate Output Analysis for Markov Chain Monte Carlo”*

- Indian Statistical Institute, Bangalore (Nov 2018, Bengaluru, India)
- Department of Statistics, University of Bath (Feb 2018, Bath, UK)
- Department of Statistics, University of Warwick (March 2016, Warwick, UK)

*“Integration is Old School!”*

- Lady Shri Ram College, University of Delhi (Jan 2018, New Delhi, India)

*“MCMC Convergence Rates for High Dimensional Bayesian Regression”*

- (Topics contributed) Joint Statistical Meeting, (August 2018, Vancouver, Canada)
- Stochastic Processes and their Applications, (June 2018, Gothenburg, Sweden)
- 2018 IISA Conference on Statistics, (May 2018, Gainesville, USA)
- International Indian Statistical Association Conference, (Dec 2017, Hyderabad, India)

### Contributed Talks

*“Lugsail Lag Windows and their Application to MCMC”*

- 11th International Conference of the ERCIM WG on Computational and Methodological Statistics (2018, Pisa, Italy)

*“Geometric Ergodicity of Gibbs Samplers in Bayesian Penalized Regression Models”*

- Monte Carlo and Quasi-Monte Carlo (2018, Rennes, France)
- Joint Statistical Meeting (2017, Baltimore, MD)

*“MCMC Output Analysis Using R Package mcmcse”*

- UseR!2017 (2017, Brussels, Belgium)

*“Multivariate Output Analysis for Markov Chain Monte Carlo”*

- 12th International Conference on Monte Carlo and Quasi-Monte Carlo, Stanford University (2016, Palo Alto, CA)
- Joint Statistical Meeting, Winner SBSS Student Paper Competition (2016, Chicago, IL)
- Spring Research Conference, Illinois Institute of Technology (2016, Chicago, IL)
- International Indian Statistical Association Conference (2015, Pune, India)

*“Multivariate Spectral Variance Estimators in Markov Chain Monte Carlo”*

- International Indian Statistical Association Conference (2016, Corvallis, OR)

*“MCMC Output Analysis”*

- Joint Statistical Meeting (2015, Seattle, WA)

## Poster

*“Geometric Ergodicity of Gibbs Samplers for Bayesian Lasso”*

- BayesComp, (2018, Barcelona, Spain)
- Sequential Monte Carlo Workshop, (2017, Uppsala, Sweden)
- IMS New Researcher’s Conference, (2017, Baltimore, MD)

*“Multivariate Output Analysis for Markov Chain Monte Carlo”*

- SAMSI Optimization Summer School, (2016, Raleigh, NC)
- Statistical Challenges in Modern Astronomy VI (2016, Pittsburgh, PA)
- SAMSI Spring Opportunities Workshop for Women in Math Sciences (2016, Raleigh, NC)
- MCMSki (2016, Lenzerheide, Switzerland)
- ASA Twin Cities, Fall Research Conference (2015, Rochester, MN)
- SAMSI Bayesian Nonparametrics Workshop (2015, Raleigh, NC)

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## Awards

### Awarded by University of Minnesota

- 2016 Director’s Award, awarded for outstanding service to the School of Statistics
- Summer 2016 Graduate Research Partnership Program Fellowship
- 2016–2017 Louise T. Dossdall Fellowship, endowed fellowship for women in STEM
- 2015–2016 School of Statistics Alumni Fellowship, awarded to an outstanding student
- Fall 2015 Martin - Buehler Fellowship in Statistics, for travel support
- Spring 2014 Bernard W. Lindgren Graduate Student Teaching Award, for excellence in teaching
- Summer 2014 Lynn Lin Fellowship in Statistics, for promise in statistical consulting

### Awarded by Statistical Associations

- JSM 2016 Student Paper Competition Winner, ASA’s Section on Bayesian Statistical Science
- IISA 2015 Student Paper Competition Winner, International Indian Statistical Association

### Travel Awards

- August 2017 Scholarship, Sequential Monte Carlo Workshop, Uppsala, Sweden
- July 2017 Diversity Scholarship, useR!2017, Brussels, Belgium
- August 2016 International Indian Statistical Association Conference, Corvallis, OR
- August 2016 SAMSI, Optimization Summer School, Raleigh, NC
- August 2016 SAMSI, Monte Carlo and Quasi Monte Carlo, Stanford, CA
- June 2016 NSF, Statistical Challenges in Modern Astronomy VI, Pittsburgh, PA
- May 2016 Spring Research Conference, Chicago, IL
- April 2016 SAMSI, Spring Opportunities Workshop for Women in Math Sciences, Raleigh, NC
- January 2016 ISBA, MCMSki V, Lenzerheide, Switzerland
- June 2015 SAMSI, Bayesian Nonparametrics Workshop, Raleigh, NC
- June 2011 NSF, Machine Learning Summer School, West Lafayette, IN

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## Teaching

### University of Minnesota

- Spring 2015 **Instructor**, STAT 3011 - Introduction to Statistical Analysis.
- 2012–2015 **Teaching Assistant**, for *undergrad and grad statistics courses*.
- Summer 2013 **Resource Instructor**, College of Science and Engineering, New Grad Student Orientation.

## Rutgers University

2011–2012 **Part Time Lecturer**, *calculus and pre-calculus*.

Fall 2010 **Grader**.

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## Experience

Summer 2015 Google Summer of Code Participant, *R package mcmcse*.

Summer 2011 Mathematical Statistician, *United States Department of Energy*, Washington, D.C..

Summer 2010 Statistical Intern, *ESPN Cricinfo*, Bengaluru, India.

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## Service

### Reviewer

Electronic Journal of Statistics (3), Journal of the American Statistical Association (1), Journal of Computational and Graphical Statistics (3), Sankhya (1), Scandinavian Journal of Statistics (1), Statistics and Computing (1), Statistics and Probability Letters (1).

### Statistical Associations

Jan 2019 Member of Review Panel, *American Statistical Association's Section on Bayesian Statistical Sciences' (SBSS) Student paper competition*.

Jan 2018 Member of Review Panel, *American Statistical Association's Section on Bayesian Statistical Sciences' (SBSS) Student paper competition*.

### Conference

May 2018 Session organizer for "Recent Advances in Markov Chain Monte Carlo", *2018 IISA International Conference on Statistics*, Gainesville, USA.

Dec 2017 Scientific Program Committee member, Session chair and organizer for "Bayesian Computation", *2017 IISA International Conference on Statistics*, Hyderabad, India.

July 2017 Session Chair, *JSM 2017*.

### University of Warwick

2017-2019 Co-organizer, *Algorithms & Computationally Intensive Inference seminar series*.

### School of Statistics, University of Minnesota

Summer 2016 Curriculum Co-organizer and Convener, *Teaching Assistant Training*.

Spring 2016 Graduate Student Representative, *Search Committee for New Faculty*.

Spring 2016 Organizer, *Student Talks Seminar Series*.

2015–16 Student Co-organizer, *Prospective Student Visit Day*.

Fall 2015 Student Co-organizer, *Advisory Panel Discussion*.

### Lady Shri Ram College

August 2010 Organizer, *L<sup>A</sup>T<sub>E</sub>X Workshop for Undergraduates*.

Spring 2010 Student Co-editor, *Eclat - A Mathematical Journal Volume I*.

2009–2010 President, *Residence Hall*.