

ARITRA HALDER

CONTACT INFORMATION

Dornsife School of Public Health,
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(Webpage)

RESEARCH INTERESTS

Bayesian Modeling, Spatiotemporal statistics.

EMPLOYMENT

Drexel University Assistant Professor (tenure-track) of Biostatistics, Dornsife School of Public Health. *Fall 2022 – Present*

University of Virginia Assistant Professor (research-track), Social and Decision Analytics Division, Biocomplexity Institute. *Fall 2020 – Fall 2022*

Virginia Tech Adjunct Professor, Department of Statistics *Fall 2021 – Fall 2022*

EDUCATION

University of Connecticut, Storrs, Connecticut USA *July 2020*

Ph.D., Statistics

- Dissertation Topic: “Wombling methods for spatial and spatiotemporal processes with applications to insurance data.”
- Advisor: Dipak K. Dey

M.S., Statistics *December 2019*

Chennai Mathematical Institute, Siruseri, Chennai India

M.Sc., Masters in Applied Mathematics *May 2016*

Presidency College, Calcutta University, Kolkata, West Bengal India

B.Sc., Honors in Statistics *June 2014*

HONORS AND AWARDS

University of Connecticut

Pre-Doctoral Dissertation Fellowship:

Awarded as a part of the training grant sponsored by Travelers Companies *Summer 2016-20*

Financial Award:

To attend Workshop on the Interface of Statistics and Optimization. *Spring 2017*

Doctoral Dissertation Fellowship: Awarded by the Graduate School. *Spring 2020*

Doctoral Student Travel Fellowship: Awarded by the Graduate School. *Spring 2020*

IMS Hannan Graduate Student Travel Award (\$500): Awarded by the Institute of Mathematical Statistics. *May 2020*

ISBA Travel Award (\$300): Awarded by the International Society for Bayesian Analysis. *February 2022*

GRANTS RECEIVED: **Biocomplexity Institute, University of Virginia**

1. United States Department of Agriculture (USDA) Strategic Priority Grant Program (SPGP): *Impacts of Rural Broadband and Broadband Programs Across Racial and Ethnic Groups*. Role: (co-PI University of Virginia). Amount: \$600,000

2. Army Research Institute (ARI) (Grant Contract ID: W911NF-20-2-0027): *Modeling of Veteran career pathways within the Army*. Amount: \$ 2,124,158 (Individual portion: \$750,000)

ACADEMIC
EXPERIENCE

Virginia Tech, Blacksburg, Virginia USA

Adjunct Professor

Fall 2021 – Fall 2022

- STAT 5054: Introduction to Statistical Computing (with R)

University of Connecticut, Storrs, Connecticut USA

Graduate Student

August, 2016 – July, 2020

Includes current Ph.D. research, Ph.D. and Masters level coursework and research/consulting projects.

Instructor

Jan – May, 2020

Taught graduate level course for the Master of Science and Engineering program. Responsible for conducting lectures, exams, homework assignments, and grades.

- STAT 3025-Q Statistical Methods, Spring 2020.

Research Study Group–COVIND-19

March, 2019 – April 2019

Worked with members from the school of public health at University of Michigan to produce spatial modeling frameworks for epidemiological models to predict the spread of novel coronavirus under intervention measures in India.

Research Assistant

August, 2016 – July, 2020

Under training grant, “**Modeling and analysis of large insurance claim and occurrence data**” awarded to the Department of Statistics, University of Connecticut, sponsored by the Travelers Companies (PI – Dipak K. Dey).

Automobile Insurance: Collision Coverage

August, 2016 – August, 2018

- Tweedie family of distributions and their applications to insurance data.
- Comparing effects of distance and boundary-based adjacency for graphical models.
- Developed scalable algorithms for estimation of spatial risk at county and zipcode levels while modeling policy premium.

Automobile Insurance: Bodily Injury Coverage

August, 2018 – August, 2019

- Developed hierarchical gamma model for size of claims.
- Performed variable selection using elastic net.

Property Insurance: Weather

August, 2018 – July, 2020

- Developed a scalable approximate Bayesian hierarchical Poisson model for claim count using Integrated Nested Laplace Approximation.
- Compared effects of different covariance kernels on estimated spatial random effects.
- Compared scalability of alternative approximate hierarchical models using Nearest Neighbor Gaussian Processes through a Matérn covariance kernel.
- Explored possible spatio-temporal extensions of developed models with focus on forecasting claims for weather related damages in property insurance.

Teaching Assistant

August, 2016 – July, 2020

Duties at various times have included office hours and leading weekly computer lab exercises and

grading.

- STAT 1000-Q Introduction to Statistics,
- STAT 1100-Q Elementary Concepts of Statistics.
- STAT 3494-W Seminar Writing Course in Statistics.
- STAT 3515-Q/5515 Design of Experiments.

Head Teaching Assistant

Winter - Intersession, 2017

Duties included shared administrative responsibilities with faculty instructor and fielding of all student inquiries.

- STAT 1100-Q Introduction to Statistics.

PUBLICATIONS

Das, S., **Halder, A.**, and Dey, D.K. (2017). Regularizing Portfolio Risk: A Bayesian Approach. *Methodology and Computing in Applied Probability*. 19(3) 865–889.

Halder, A., Das, S., Lahiri, A. and Dey, D. K. (2018) Modeling portfolio risk and return using Dirichlet process prior. <https://arxiv.org/pdf/1805.00306.pdf>

Mukherjee, R., **Halder, A.**, Naik, S., Sansare, S. and Chaudhuri, B. (2020). Statistical quantification of parameters altering tribo-charging in pharmaceutical mixtures. *Featured Article, Journal of Pharmaceutical Sciences*.

Ray, D., Salvatore, M., Bhattacharyya, R., Wang, L., Mohammed, S., Purkayastha, S., **Halder, A.**, Rix, A., Barker, A., Kleinsasser, M., Zhou, Y., Song, P., Bose, D., Banerjee, M., Baladandayuthapani, V., Ghosh, P., Mukherjee B. (2020) *Predictions, role of interventions and effects of a historic national lockdown in India's response to the COVID-19 pandemic: data science call to arms. Harvard Data Science Review, Special Issue-1.* <https://hdsr.mitpress.mit.edu/specialissue1>.

Sen K., Mukherjee R., Sansare S., **Halder A.**, Kashi H., Ma A WK , Chaudhuri B. (2021) Impact of powder-binder interactions on 3D printability of pharmaceutical tablets using drop test methodology *European Journal of Pharmaceutical Sciences*. 160 105775.

Halder, A., Mohammed, S., Chen, K. and Dey, D. K. (2021) Spatial Tweedie exponential dispersion models: an application to insurance rate-making. *Scandinavian Actuarial Journal* 1–20

Babu, G. R., Ray, D., Bhaduri, R., **Halder, A.** and Kundu, R. , Menon, G. I. and Mukherjee, B. (2021) COVID-19 Pandemic in India: Through the Lens of Modeling. *Global Health: Science and Practice*.

PAPERS SUBMITTED

Halder, A., Banerjee, S. and Dey, D. K. Bayesian Modeling with Spatial Curvature Processes. *Submitted to Journal of American Statistical Association (Theory and Methods)*.

Halder, A., Mohammed, S. and Dey, D. K. Bayesian Variable Selection in Double Generalized Linear Tweedie Spatial Process Models. *Submitted to New England Journal of Statistics in Data Science*.

PAPERS IN PREPARATION

Halder, A., Banerjee, S. and Dey, D. K. Bayesian spatiotemporal curvilinear wombling. *In preparation*.

Halder, A. and Dey, D. K. Approximate Bayesian inference for Tweedie latent Gaussian models. *In preparation*.

Halder, A., Banerjee, S. and Dey, D .K. Multivariate wombling using spatiotemporally varying

local co-regionalization models. *In preparation.*

Halder, A. and Dey, D .K. Tweedie exponential dispersion mixture models. *In preparation.*

PROFESSIONAL
EXPERIENCE

The Travelers Companies, Hartford, Connecticut, USA.

Summer researcher

Summer 2016 - Summer 2020

Continued work on scalable modeling and spatial risk estimation under different insurance coverages for automobile and property insurance aimed at producing deliverable software on project completion.

COMPUTER SKILLS

- Statistical Packages: R, BUGS; some experience with SAS, SAS-EG;
- Applications: L^AT_EX, common Windows database, spreadsheet, and presentation software
- Operating Systems: Unix/Linux, Windows.

ACADEMIC SERVICE **Reviewer:**

2019– present

- Spatial Statistics
- Sankhyā B
- Journal of Spatial Science

Chairing:

- IISA 2021 Conference
 - IS 58 Contemporary Bayesian Modeling with Applications
- New England Statistical Symposium, 2022
 - IS-13: Advances in Statistical Modeling of Complex Structured Brain Data
- Joint Statistical Meetings, 2022: Modern Advances in Modeling complex Spatial data

INVITED
DEPARTMENT TALKS
AND COLLOQUIUMS

- Department of Statistics, Presidency University, Kolkata, India. Invited by Prof. Biswajit Roy, Chair, Department of Statistics.
- Department of Statistics and Data Science, University of Cincinnati, Ohio. Invited by Dr. Xia Wang, Associate Professor, Department of Statistics and Data Science.
- Department of Data Science, Chennai Mathematical Institute, Chennai, India. Invited by Dr. Sourish Das, Associate Professor, Department of Data Science.

CONFERENCES AND
WORKSHOPS

CONFERENCES:

- 31st New England Statistics Symposium, *2017*
Presented *Modeling Large Insurance Claims and Occurrence Data.*
- Joint Statistical Meetings *2020*
Presented (Contributed Session) *Curvature processes: Directional concavity in Gaussian random fields.*
- Conference organized by the International Indian Statistical Association (IISA) *2020*
Presented (Contributed Session) *Spatial Tweedie exponential dispersion models: an application to insurance rate-making.*

- Joint Statistical Meetings 2021
Presented (Contributed Session) *Bayesian spatiotemporal modeling of Army Veteran Career Pathways*
- EAC-ISBA 2021
Presented (Poster Session) *Curvature Processes: Directional Concavity in random fields*
- IISA Mini Conference (Contributed) (Virtual) 2022
Presented *Curvature Processes: Directional Concavity in random fields*
- Workshop in Probability and Statistical Methods, Brazil (Invited) (Virtual) 2022
Presented *Curvature Processes: Directional Concavity in random fields*
- 35th New England Statistical Symposium, Storrs (Invited) (In-person) 2022
Presented *Bayesian Variable Selection in Double Generalized Linear Tweedie Spatial Process Models.*
- 5th International Conference on Econometrics and Statistics (Invited) (Virtual) 2022
Presented *Bayesian Variable Selection in Double Generalized Linear Tweedie Spatial Process Models.*

WORKSHOPS:

- SAMSI Workshop in the Interface of Statistics and Optimization (WISO),
Duke University 2017
- Broadening Participation: 2022 Mathematical and Physical Sciences Workshop for Young
Investigators,
National Science Foundation and University of Florida 2022

PROFESSIONAL
SOCIETY
MEMBERSHIP

- American Statistical Association
- Institute of Mathematical Statistics
- International Society for Bayesian Analysis