

Shariq Mohammed

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PRESENT POSITION

Assistant Professor

August 2021+

Department of Biostatistics
Boston University (BU), Boston, MA

EDUCATION & TRAINING

University of Michigan (U-M), Ann Arbor, MI

Precision Health Scholar

2019-2021

Postdoctoral Research Fellow

2018-2021

Mentors: Dr. Veerabhadran Baladandayuthapani & Dr. Arvind Rao

University of Connecticut (UConn), Storrs, CT

Ph.D. in Statistics

August 2018

Dissertation: Bayesian variable selection with applications to neuroimaging data

Advisors: Dr. Dipak Dey & Dr. Yuping Zhang

M.S. in Statistics

September 2017

Chennai Mathematical Institute (CMI), Chennai, India

M.Sc. Applications of Mathematics

May 2014

Indian Statistical Institute (ISI), Bangalore, India

B.Math.(Hons.)

June 2012

RESEARCH POSITIONS

Research Assistant, *The Travelers Companies*, Hartford, Connecticut

2016 - 2018

Graduate/Research Assistant, *UConn*

2016 - 2017

Summer Student Worker, *Pfizer Inc.*, Boston, Massachusetts

Summer 2016

Research Intern, *Tata Consultancy Services Innovation Labs*, Hyderabad, India

Summer 2013

RESEARCH INTERESTS

Methodology:

Bayesian modeling, variable selection, geometric/functional data analysis and spatial statistics

Applications:

biomedical imaging analysis, neuro- and cancer-imaging, imaging-genomics and precision health

PUBLICATIONS

12. **Mohammed, S.**, Ravikumar, V., Warner, E., Patel, S.H. et al.: Quantifying T2-FLAIR mismatch using geographically weighted regression and predicting molecular status in lower-grade gliomas. To appear in *American Journal of Neuroradiology*.
11. Halder, A., **Mohammed, S.**, Chen, K. and Dey D.K.: Spatial Tweedie exponential dispersion models: An application to insurance rate-making. *Scandinavian Actuarial Journal*.
[10.1080/03461238.2021.1921017](https://doi.org/10.1080/03461238.2021.1921017)
10. **Mohammed, S.**, Bharath, K., Kurtek, S., Rao, A., Baladandayuthapani, V.: RADIOHEAD: Radiogenomic analysis incorporating tumor heterogeneity in imaging through densities. To appear in *Annals of Applied Statistics*.
9. **Mohammed, S.** and Dey D.K. (2021): Scalable spatio-temporal Bayesian analysis of high-dimensional electroencephalography data. *Canadian Journal of Statistics*. [10.1002/cjs.11592](https://doi.org/10.1002/cjs.11592)
8. Lee, J., Wang, N., Turk, S., **Mohammed, S.** et al., (2020): Discriminating pseudoprogression and true progression in diffuse infiltrating glioma using multi-parametric MRI data through deep learning. *Scientific Reports*, 10, 2033. [10.1038/s41598-020-77389-0](https://doi.org/10.1038/s41598-020-77389-0)
7. **Mohammed, S.**, Li, T., Chen, X.D., Warner, E. et al., (2020). Density-based classification in diabetic retinopathy through thickness of retinal layers from optical coherence tomography. *Scientific Reports*, 10(1), pp.1–13. [10.1038/s41598-020-72813-x](https://doi.org/10.1038/s41598-020-72813-x)
6. Chekouo, T.*, **Mohammed, S***, Rao, A*. (2020): A Bayesian 2D functional linear model for gray-level co-occurrence matrices in texture analysis of lower grade gliomas. *NeuroImage: Clinical*, 28, p.102437. [10.1016/j.nicl.2020.102437](https://doi.org/10.1016/j.nicl.2020.102437) (*co-corresponding author)
5. **Mohammed, S.**, Dey D.K. and Zhang, Y. (2020): Classification of high-dimensional electroencephalography data with location selection using structured spike-and-slab prior. *Statistical Analysis and Data Mining: The ASA Data Science Journal*, 13(5), pp.465–481. [10.1002/sam.11477](https://doi.org/10.1002/sam.11477) (Invited for SADM Best Paper Session at JSM 2022.)
4. Ray, D., Salvatore, M., Bhattacharyya, R., Wang, L., Du, J., **Mohammed, S.** et al., (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*(Suppl 1). [10.1162/99608f92.60e08ed5](https://doi.org/10.1162/99608f92.60e08ed5)
3. **Mohammed, S.**, Dey D.K. and Zhang, Y. (2019): Bayesian variable selection using spike-and-slab priors with application to high dimensional electroencephalography data by local modelling. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 68(5), pp.1305–1326. [10.1111/rssc.12369](https://doi.org/10.1111/rssc.12369)
2. **Mohammed, S.** and Dey D.K. (2019): Assessing malaria using neutral-zone classifiers with mixture discriminant analysis on 2D images of red blood cells. *Journal of Biostatistics and Epidemiology*, 5(1), pp.1–11. [10.18502/jbe.v5i1.1901](https://doi.org/10.18502/jbe.v5i1.1901)
1. Bhat, S.P., Murali, U.K. and **Mohammed, S.** (2016): A dynamical systems approach to systemic risk in a financial network. In *2016 Indian Control Conference (ICC)*, pp.377–384. IEEE. [10.1109/INDIANCC.2016.7441162](https://doi.org/10.1109/INDIANCC.2016.7441162)

Book Chapter:

1. Matuk, J., **Mohammed, S.**, Kurtek, S. and Bharath, K. (2020): Biomedical applications of geometric functional data analysis. In *Handbook of Variational Methods for Nonlinear Geometric*

Preprints:

5. **Mohammed, S.**, Kurtek, S., Bharath, K., Rao, A., Baladandayuthapani, V.: Tumor radiogenomics with Bayesian layered variable selection. [arXiv:2106.10941](https://arxiv.org/abs/2106.10941)
4. Bhattachayya, R., Banerjee, S., **Mohammed, S.** and Baladandayuthapani, V.: Network-based modeling of COVID-19 dynamics: Early pandemic spread in India. [medRxiv](https://medrxiv.org/content/early/2021/06/01/2021.05.28.21261111)
3. Panigrahi, S., **Mohammed, S.**, Rao, A. and Baladandayuthapani, V.: Integrative Bayesian models using post-selective inference: A case study in radiogenomics. *Submitted*. [arXiv:2004.12012](https://arxiv.org/abs/2004.12012)
2. Chekouo, T., Stingo, F.C., **Mohammed, S.**, Rao, A., Baladandayuthapani, V.: A Bayesian group selection with compositional responses for analysis of radiologic tumor proportions and their genomic determinants *Submitted*.
1. Halder, A., **Mohammed, S.**, Chen, K. and Dey D.K.: Spatial risk estimation in Tweedie compound Poisson double generalized linear models. *Submitted*. [arXiv:1912.12356](https://arxiv.org/abs/1912.12356)

SOFTWARE

R Packages (on GitHub)

- RADIOHEAD - github.com/shariq-mohammed/RADIOHEAD
- ScalableBayesEEG - github.com/shariq-mohammed/ScalableBayesEEG
- stSpikeSlabEEG - github.com/shariq-mohammed/stSpikeSlabEEG
- SpikeSlabEEG - github.com/shariq-mohammed/SpikeSlabEEG

GRANTS & AWARDS

Grants

- Integrative decision models combining radiological-imaging and genotypic data in gliomas: *Precision Health Scholars Award (\$80K)* by Precision Health at U-M 2019 - 2021

Awards

- *Doctoral Dissertation Fellowship* awarded by Graduate School at UConn Spring 2018
- *Doctoral Student Travel Award* awarded by Graduate School at UConn 2017
- Multiple conference travel grants from Department of Statistics at UConn 2017
- *Pre-doctoral Dissertation Fellowship* Summer 2016
- *Matthew M. Goldstein Graduate Fellowship* Summer 2015
- *CMI Medal of Excellence* for outstanding performance in National Graduate Program in Applications of Mathematics 2014
- *Post-graduate Fellowship* awarded by CMI 2012 - 2014
- *INSPIRE Scholarship for Higher Education* awarded by Ministry of Science & Technology, Government of India 2009 - 2014
- *Undergraduate Fellowship* awarded by ISI 2009 - 2012

TEACHING

Instructor

- Introduction to R: software for statistical computing - BU *Spring 2022*
- Computational Biostatistics and Survival Analysis - a workshop at *Tata Memorial Center*, Navi Mumbai, India (taught jointly with Dr. *Bhramar Mukherjee*) *December 2019*
★ shariq-mohammed.github.io/teaching/cbsa2019/
- Statistical Methods (Calculus level I) - UConn *Summer & Fall 2017*

Teaching Assistant

- Introduction to Statistics I & II, and Introduction to Mathematical Statistics I & II - Department of Statistics, UConn *Fall 2014 - Spring 2016*
- Numerical Linear Algebra and Probability Theory - CMI *Spring & Fall 2013*

TALKS

Invited

- Eastern Asia Chapter of The International Society for Bayesian Analysis (ISBA) Conference (*Upcoming*) *November 2021*
- BU Biostatistics Student Association Seminar, BU (*Upcoming*) *November 2021*
- Biostatistics Career Development panel on 'Academic Career Path', BU *October 2021*
- Joint Statistical Meetings - Virtual *August 2021*
- Center for Computational Mathematics Seminar, Flatiron Institute, Simons Foundation, New York - Virtual *June 2021*
- Statistical Methods in Imaging Conference - Virtual *May 2021*
- ENAR Spring Meeting - Virtual *March 2021*
- Precision Health Seminar (Pharmacy 217) - Virtual, U-M *February 2021*
- 2020 U-M Precision Health Symposium - Virtual (*Poster*) *September 2020*
- StatChat 2020 - Panel discussions at NMIMS Sunandan Divatia School of Science, Mumbai, India - Virtual *August & September 2020*
- Joint Statistical Meetings - Virtual (*Topic-contributed*) *August 2020*
- MIDAS COVID-19 Special Seminar Series, U-M (*Group presentation*) *June 2020*
- ENAR Spring Meeting, Nashville, Tennessee *March 2020*
- Precision Health Seminar (Pharmacy 217), U-M *March 2020*
- Tools and Technology Seminar, U-M *March 2020*
- IISA Annual Conference, Mumbai, India *December 2019*

Contributed

- ENAR Spring Meeting, Philadelphia, Pennsylvania *March 2019*
- Joint Statistical Meetings, Vancouver, Canada *July 2018*
- Symposium on Data Science and Statistics, Reston, Virginia *May 2018*
- BayesComp 2018. Barcelona, Spain (*Poster*) *March 2018*

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- IISA Annual Conference, Hyderabad, India *December 2017*
 - 34th Quality and Productivity Research Conference, UConn (*Poster*) *June 2017*
 - 31st New England Statistics Symposium, UConn *April 2017*

SERVICE & LEADERSHIP

Academic

- *Reviewer*: Annals of Applied Statistics, Biometrics, Biostatistics, Clinical Cancer Informatics, Harvard Data Science Review, Journal of the American Medical Informatics Association, Spatial Statistics *2019+*
- *Member*: Membership & Outreach Committee, IISA *2020+*
- *Organizer (Invited Sessions)*: JSM 2020, ENAR Spring Meeting 2021, JSM 2021 *2020+*

Departmental

- *Co-organizer*, Biostatistics Department Seminar, BU *2021+*
- *Vice-President*, Statistics Graduate Student Committee, UConn *2016 - 2017*
- *Vice-Chair* of Student Committee, 31st New England Statistics Symposium *April 2017*
- *Co-President*, Statistics Graduate Student Committee, UConn *2015 - 2016*
- *Senator*, UConn Graduate Student Senate *2015 - 2016*

External

- *Advisor, President, Treasurer*, Tarang (South Asian cultural organisation), UConn *2015-18*
- *Student Representative*, Senate Faculty Standards Committee, UConn *2015 - 2016*