

Shariq Mohammed

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PRESENT POSITION

Precision Health Scholar

September 2019+

Postdoctoral Research Fellow

September 2018+

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

Mentors: Dr. Veerabhadran Baladandayuthapani & Dr. Arvind Rao

EDUCATION

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 INTERESTS

Bayesian modeling, variable selection, medical imaging analysis, applications in neuro- and cancer-imaging, imaging-genomics and precision health

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

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 *September 2019+*

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

PUBLICATIONS

- Mohammed, S.** and Dey D.K. (2020+): Scalable spatio-temporal Bayesian analysis of high-dimensional electroencephalography data. To appear in *The Canadian Journal of Statistics*.
- Lee, J., Wang, N., Turk, S., **Mohammed, S.** et. al., (2020+): Discriminating Pseudoprogession and True Progression in Diffuse Infiltrating Glioma using Multi-parametric MRI data through Deep Learning. To appear in *Scientific Reports*.
- Mohammed, S.**, Li, T., Chen, X.D., Warner, E., Shankar, A., Abalem, M.F., Jayasundera, T., Gardner, T.W. and Rao, A. (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)
- 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)
- 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)
- 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)
- 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)
- 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)
- 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:

- 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 Data*, pp.675–701. Springer, Cham. [10.1007/978-3-030-31351-7_24](https://doi.org/10.1007/978-3-030-31351-7_24)

Preprints:

- Mohammed, S.**, Kurtek, S., Bharath, K., Rao, A., Baladandayuthapani, V.: Tumor radio-genomics with Bayesian layered variable selection. *Submitted*.

Mohammed, S., Bharath, K., Kurtek, S., Rao, A., Baladandayuthapani, V.: RADIOHEAD: Radiogenomic analysis incorporating tumor heterogeneity in imaging through densities. *Revision submitted*.

Chekouo, T., Stingo, F.C., **Mohammed, S**, Rao, A., Baladandayuthapani, V.: A Bayesian group selection approach for the analysis of volumetric images of brain cancers and their genomic determinants. *Submitted*.

Panigrahi, S., **Mohammed, S.**, Rao, A. and Baladandayuthapani, V.: Integrative Bayesian models using post-selective inference: a case study in radiogenomics. [arXiv:2004.12012](#)

Halder, A., **Mohammed, S.**, Chen, K. and Dey D.K.: Spatial risk estimation in Tweedie compound Poisson double generalized linear models. *Under review*. [arXiv:1912.12356](#)

Halder, A., **Mohammed, S.**, Chen, K. and Dey D.K.: Spatial Tweedie exponential dispersion models. *Under review*. [arXiv:2003.06299](#)

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

TEACHING

Instructor

- Computational Biostatistics and Survival Analysis - a workshop at *Tata Memorial Center*, Navi Mumbai, India (taught jointly with Dr. *Bhramar Mukherjee*) *December 2019*
 ★ Prepared course materials and gave lectures on R computations for survival analysis and variable selection approaches
- Statistical Methods (Calculus level I) - UConn *Summer & Fall 2017*
 ★ Prepared course materials (including homework and exams), gave lectures, and graded and provided evaluation to students

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 2013 - Fall 2013*

TALKS

Invited

- 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*
- 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*: Biometrics, Biostatistics, Clinical Cancer Informatics, Harvard Data Science Review, Journal of the American Medical Informatics Association *2019 - 20*
- *Member*: Membership & Outreach Committee, IISA *2020+*
- *Organizer (Invited Sessions)*: JSM 2020, ENAR Spring Meeting 2021, JSM 2021 *2020+*

Departmental

- *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*, Tarang (South Asian cultural organisation), UConn *2017 - 2018*
- *President*, Tarang, UConn *2016 - 2017*
- *Student Representative*, Senate Faculty Standards Committee, UConn *2015 - 2016*
- *Treasurer*, Tarang, UConn *2015 - 2016*

REFERENCES

- Dr. Veerabhadran Baladandayuthapani, Professor of Biostatistics, University of Michigan, Ann Arbor, Michigan. *Contact: veerab@umich.edu or (734) 764-5702*
- Dr. Dipak K. Dey, Board of Trustees Distinguished Professor, University of Connecticut, Storrs, Connecticut. *Contact: dipak.dey@uconn.edu or (860) 486-4755*
- Dr. Arvind Rao, Associate Professor of Computational Medicine & Bioinformatics, University of Michigan, Ann Arbor, Michigan. *Contact: ukarvind@umich.edu or (734) 647-1289*