Tahmidul Islam

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Interests

Machine Learning, Functional Data, Longitudinal Data, Bayesian Analysis, Mixed Effect Model, Gaussian Process

Education

University of South Carolina • Columbia, SC — August 2016 – 2021
Doctor of Philosophy • *Statistics*

University of Dhaka • Dhaka, Bangladesh — August 2014 – March 2016
Master of Science • *Statistics*

University of Dhaka • Dhaka, Bangladesh — January 2010 – August 2014
Bachelor of Science • *Statistics*

Work Experience

Graduate Assistant — University of South Carolina — August 2016 – Present
Columbia, SC

- Lecture and lab instructor, Department of Statistics
  - Duties: Prepare and deliver lectures, lab and examination materials, manage course using Blackboard and Pearson's MyLab & Mastering, train new graduate assistants
  - Taught courses: STAT 201: Elementary Statistics (72 students each semester) and STAT 509: Statistics for Engineers
- Research assistant, Department of Biostatistics and Epidemiology, Arnold School of Public Health
  - Investigated association between small for gestation age and infant mortality in USA
  - Acquired birth and death record data from US vital statistics system
  - Applied GAM and computed confidence interval for the adjusted relative risk using posterior simulation

Statistical Officer – International Centre for Diarrhoeal Disease Research, Bangladesh Sep 2015 – Jan 2016
Dhaka, Bangladesh

- Gathered, maintained, cleaned and analyzed health surveillance system data
- Consulted public health researchers with research design, sample size calculation and statistical methodologies

Projects

Bayesian framework for analyzing sparse functional data using Gaussian process – Ph.D. Dissertation

- Developed unified Bayesian framework for modeling sparse and regular functional data and obtained an estimate of the mean function with uncertainty quantification
- Derived classification algorithm for sparse function data
- Successfully applied the model to spinal bone mineral density (longitudinal) data, temporal gene expression data
- Derived approximation free efficient computation for non-sparse (regular) functional data

Computationally efficient Gaussian process regression for data with replications

- Derived algorithm to perform GP computation on unique grid points only, reducing computational complexity for replicated data

Spatial analysis of COVID-19 cases in the UK

- Performed geographically weighted regression (GWR) to model association between COVID rate and racial/ethnic minority (BAME) concentration

COVID-19 cases and deaths projection using Gaussian process regression with Richard's curve prior

- Used GP regression with pre-specified mean function to project the cumulative number of confirmed cases and deaths in the US (by state) (`https://tahmid-usc.github.io/covidGP`)

Forecast electricity power load in Texas with TBATS model

Predict breast cancer from the digitized image of fine needle aspirate of breast mass using LASSO logistic regression

Frailty and GLMM for analyzing under-5 mortality and child malnutrition in Bangladesh

Kaggle competitions

- Otto Group Product Classification Challenge
- Predict annual restaurant sales based on objective measurements
- Handwritten Digit Recognition

Technical Skills

- Programming languages and Packages: R, SAS, stata, SPSS, Python, SQL, Git, Bash, Markdown, SLURM (High Performance Computing)
- Other computer experience: Latex, MS Office Suite

Publications/Conferences

- Islam, T., Chakraborty, P., Grego, J., and Lynch, J. (2020). A Bayesian Nonparametric Model for Sparse Functional Data Using Gaussian Process Priors. *Computational Statistics and Data Analysis (submitted)*
- Islam, T., Chakraborty, P., Lynch, J., and Grego, J. (2019). Bayesian Smoothing and Classification of Sparse Functional Data Using Gaussian Process. Poster session (Bayesian Methods) at the JSM, Denver, CO
- Islam, T. (2019). Learning Images with Gaussian Process Regression and Application to Classification. Poster session (Machine Learning) at the ENAR, Philadelphia, PA
- Islam, T., Rabbani, M., and Bari, W. (2016). Analyzing child malnutrition in Bangladesh: Generalized linear mixed model approach. *Dhaka University Journal of Science*

Awards

- Outstanding Graduate Assistant Award 2018
- Outstanding First-Year Graduate Student Award 2017
- National Science and Technology Fellowship; Bangladesh Government

Professional Society Memberships

- American Statistical Association (ASA)
- International Biometric Society (ENAR)

Graduate Courses

- Probability theory I & II
- Mathematical Statistics I & II
- Data Analysis I & II
- Stochastic Processes
- Advanced Inference
- Nonparametric Inference
- Large Sample Theory
- Categorical Data Analysis
- Computing with R and SAS
- Linear Models
- Biostatistics
- Artificial Intelligence
- Statistical Consulting
- Econometrics