Ibrahim Hossain Sajal

Email : IbrahimHossain.Sajal@utdallas.edu
LinkedIn : @IHSajal
Mobile : +1-682-232-8791

Education

PhD in Statistics
School of Natural Science and Mathematics, University of Texas at Dallas *Aug. 2019 – Dec. 2024*

Masters in Applied Statistics
Institute of Statistical Research and Training, University of Dhaka *Jan. 2017 – Dec. 2017*

Bachelors in Applied Statistics
Institute of Statistical Research and Training, University of Dhaka *Jan. 2013 – Dec. 2016*

Professional Experience

Postdoctoral Fellow Jan. 2025 – Present
Integrative Tumor Epidemiology Branch, National Cancer Institute, National Institutes of Health

- Identifying plasma proteins as mediators of the effects of risk factors on renal cell carcinoma using GWAS summary statistics.
- Developing general framework to test for rare variant association with multiple phenotypes using GWAS summary statistics.

Graduate Researcher Aug. 2019 – Dec. 2024
School of Natural Science and Mathematics, University of Texas at Dallas

- **Cancer risk prediction - CBCRisk-Black**: Contralateral breast cancer (CBC) risk prediction model for black women.
  - Developed a relative risk model for CBC using matched LASSO logistic regression on BCSC data, and performed survival analysis on SEER data to estimate absolute risks.
  - Validated the CBCRisk-Black model through six-fold cross-validation, achieving a 10% increase in the area under the ROC curve compared to the existing CBCRisk model for 3- and 5-year predictions.
  - Implemented multivariate imputation by chained equations (MICE) to ensure robustness of CBCRisk-Black and created an R package for accessibility by patients, clinicians, and researchers.
- **CBC risk prediction tool for contralateral prophylactic mastectomy (CPM) decision making**: .
  - Developing CBC risk prediction model using only the pre-surgical (mastectomy) risk factors. With risk estimates from this model, a BC patient who is about to undergo mastectomy can decide whether to undergo CPM at the same time.
- **Genetic association test - bivariate QBL**: Detecting rare haplotype association with two correlated continuous phenotypes.
  - Applied Bayesian LASSO to regularize regression coefficients, enhancing the detection of associated haplotypes by leveraging a latent variable to model the correlation between two phenotypes.
  - Estimated the posterior distribution using MCMC and calculated Bayes factors to identify haplotype effects, achieving significant performance improvements in bivariate QBL over the existing association test, Haplo.score.
  - Conducted extensive simulations and analyzed GAW 19 exome sequencing data to uncover rare haplotypes associated with systolic and diastolic blood pressures.
- **Multivariate genetic association test**:
  - Developing a multivariate version of the bivariate QBL test using an efficient machine learning tool, Variational Inference, for approximation of the parameter distribution.
  - Investigating the statistical properties of the test using simulations and comparing its power to that of bivariate QBL.

Technical Skills

Data Analysis: R, SAS, STATA, MATLAB, SPSS
Programming Language: C
Documentation: Latex, Microsoft Word, Excel, PowerPoint
Reference management: Endnote, Mendeley

Poster Presentations

- **Bivariate QBL for Detecting Rare Haplotype Association with Two Correlated Phenotypes**.
  Advances in Statistical and Computational Methods for
  Analysis of Biomedical, Genetic, and Omics Data (ABGOD), Dallas, TX Mar. 2023.
  Southern Regional Conference on Statistics (SRCOS), Jekyll Island, GA Sep. 2022.

Publications

- **IH. Sajal** and S. Biswas, (2023), *Bivariate Quantitative Bayesian LASSO for Detecting Association of Rare Haplotypes with Two Correlated Continuous Phenotypes*, Frontiers in Genetics, *14*.
- **IH. Sajal**, M. Chowdhury, T. Wang, D. Euhus, P. Choudhary, and S. Biswas, (2022), *CBCRisk-Black: A Personalized Contralateral Breast Cancer Risk Prediction Model for Black Women*, Breast Cancer Research and Treatment, *194(1):179-86*.
- R. Das Gupta, M. Akonde, **IH. Sajal**, A. Kibria, G. Muhammed, (2021), *Association between height and hypertension among US adults: analyses of National Health and Nutrition Examination Survey 2007–18*, Clinical Hypertension, *27(1), 1-12*.
- A. Talukder, R. Das Gupta, MR. Hashan, SS. Haider, **IH. Sajal**, M. Sarker, (2021), *Association between television viewing and overweight and obesity among women of reproductive age in Timor- Leste: evidence from the demographic health survey 2016*, BMJ Open, *11(8), e045547*.
- R. Das Gupta, M. Jahan, M. Hasan, I. Sutradhar, **IH. Sajal**, SS. Haider, M. Sarker, (2020), *Factors associated with tobacco use among Nepalese men aged 15–49 years: data from Nepal demographic and Health Survey 2016*, Clinical Epidemiology and Global Health, *8(3), 748-757*.
- R. Das Gupta, SS. Haider, I. Sutradhar, MR. Hashan, **IH. Sajal**, M. Sarker, (2019), *Association of frequency of television watching with overweight and obesity among women of reproductive age in India: evidence from a nationally representative study*, PloS one, *14(8), e0221758*.
- R. Das Gupta, SS. Haider, MR. Hashan, M. Hasan, I. Sutradhar, **IH. Sajal**, H. Joshi, MR. Haider, M. Sarker, (2019), *Association between the frequency of television watching and overweight and obesity among women of reproductive age in Nepal: analysis of data from Nepal Demographic Health survey 2016*, PloS one, *15(2), e0228862*.
- R. Das Gupta, **IH. Sajal**, M. Hasan, I. Sutradhar, MR. Haider, M. Sarker, (2019), *Frequency of television viewing and association with overweight and obesity among women of the reproductive age group in Myanmar: results from a nationwide cross-sectional survey*, BMJ Open, *9(3), e024680*.

Scholarships and Awards

- **Fellows Award for Research Excellence** *National Institutes of Health* Jul. 2025
- **Mei Lein Fellowship** *University of Texas at Dallas* May 2023, May 2022
- **Travel Award** Jan. 2023
  Advances in Statistical and Computational Methods for Analysis of Biomedical, Genetic, and Omics Data, Dallas, TX
- **Boyd Harshburger Travel Award** *Southern Regional Conference on Statistics, Jekyll Island, GA* Sep. 2022
- **PhD Research Small Grant Program** *University of Texas at Dallas* May 2022
- **Summer Institute in Statistical Genetics Scholarship** *University of Washington* May 2021
- **Academic Excellence Award** *University of Dhaka, Bangladesh* Dec. 2017

Training and Workshops attended

- **Python for Data Science Workshop** *University of Texas at Dallas* Jul. 2022
- **Summer Institute in Statistical Genetics** *University of Washington* Jul. 2021
  Module: Introduction to Genetics and Genomics, Genetic Epidemiology, MCMC for Genetics.

Volunteer Experiences

- **Advances in Statistical and Computational Methods for Analysis of Biomedical, Genetic, and Omics Data**. *Dallas, TX* Mar. 17-19, 2023
- **Florence Nightingale Day** (Event to promote statistics to school-going students.) *Dallas, TX* 2021-2022
- **Global Conference on Implementation Science (GCIS)** *Dhaka, Bangladesh* Jun. 29 - Jul. 1, 2019
- **International Conference on Applied Statistics (ICAS)** *Dhaka, Bangladesh* Dec. 27-29, 2014