

Subrata Paul – Résumé



Ph.D. Candidate

Department of Mathematical and Statistical Sciences
University of Colorado Denver
1201 Larimer St. Room 4214
Denver, CO 80204

Mobile Phone +1 (765) 631 5129
Email subrata.paul@ucdenver.edu
Website math.ucdenver.edu/~spaul/
Linkedin www.linkedin.com/in/paulsub/

Objective

My research interests are in the area of statistical genetics. I am fascinated to apply my mathematics background from my undergraduate and graduate programs to understand human disease using human inheritance. To achieve this goal, I am working towards a Ph.D. in Applied Mathematics focusing on statistics and genetics. I have research experience in studying complex traits, understanding the architecture of diseases and developing a predictive polygenic risk score for vitiligo. My Ph.D. dissertation is focused on the incorporation of disease heterogeneity into association studies and modeling multivariate secondary phenotypes to uncover subtypes of complex disease and improve the statistical power of association model simultaneously. My research interests include genetic risk prediction, disease subtyping, precision medicine, genetic association studies, statistical modeling, machine learning, and data analysis.

Research Experience:

- May 2015** | Research Assistant, Dept. of Mathematical and Statistical Sciences, CU Denver
Project: Genetic Studies of Vitiligo
- Ongoing** | This project was for genetic risk prediction using polygenic risk score and disease subtyping. My responsibility was data pre-processing, building risk scores, perform meta analysis and compare risk scores based on their AUC values. I was also involved in analysis of secondary phenotypes.
- May 2018** | Collaboration with Department of Electrical Engineering, CU Denver
to | Project: Real time energy price forecasting
- July 2018** | Applied artificial neural network on intuitively designed feature space for forecasting electricity price in real time.
- June 2017** | Research Assistant, Dept. of Mathematical and Statistical Sciences, CU Denver
to | Project: Extreme Value Theory for Spatially-Indexed Functional Data
- July 2017** | This project focuses on the development of statistical tools to model the spatial and temporal structure of environmental and climate extreme events.

Skills

Core	Statistical Modeling Machine Learning Human Genetics Computational Math Pure Math	Programming Languages	R (Expert) Python (Advanced level) SQL, MATLAB, C++, FORTRAN (Intermediate)
Languages	English (Proficient) Bengali (Native) Hindi (Communication)	Others	Latex, Beamer Mathematica Data Visualization Inkscape

Education

Aug 2014	University of Colorado Denver PhD in Applied Mathematics
Ongoing	Concentration in Statistical Genetics. With in the course work I have learned advanced statistical models, Bayesian analysis, machine learning techniques, human genetics etc.
Aug 2012 to May 2014	Ball State University, Indiana, USA MS in Mathematics MS thesis: <i>Numerical Multigrid algorithm for solving Integral Equation</i> . Focused on solving special types of integral equations with less computational complexity using multigrid method and to show its efficiency.
Mar 2008 to May 2010	University of Dhaka MS in Applied Mathematics MS thesis on numerical integration.
Mar 2003 to Dec 2007	University of Dhaka BS in Mathematics with minors in Computer Science, Statistics and Physics BS project: <i>On Binomial Asset Pricing Model with convergence to Black-Scholes model</i> . Discussed the power of binomial model on asset pricing and proven its strength by showing its convergence to Black-Scholes model.

Publications and Posters

2019	Genevieve H. L. Roberts, Subrata Paul, Daniel Yorgov, Stephanie A. Santorico, and Richard A. Spritz. Family clustering of autoimmune vitiligo results principally from polygenic inheritance of common risk alleles. <i>The American Journal of Human Genetics</i> , July 2019
2018	Subrata Paul and Stephanie A Santorico. Incorporation of heterogeneity through a mixture model to boost power of association tests. In <i>GENETIC EPIDEMIOLOGY</i> , volume 42, pages 722–722, 2018
2018	Md Habib Ullah, Subrata Paul, and Jae-Do Park. Real-time electricity price forecasting for energy management in grid-tied mtcd microgrids. In <i>2018 IEEE Energy Conversion Congress and Exposition (ECCE)</i> , pages 73–80. IEEE, 2018
2016	Stephanie A Santorico, Subrata Paul, Daniel Yorgov, Ying Jin, Tracey Ferrara, and Richard A Spritz. A comparison of genetic risk prediction and subtyping for generalized vitiligo. In <i>GENETIC EPIDEMIOLOGY</i> , volume 40, pages 657–658, 2016
2015	Stephanie A Santorico, Ying Jin, Daniel Yorgov, Subrata Paul, Tracey Ferrara, and Richard Spritz. Optimized genetic risk prediction for vitiligo and its use to define disease subtypes. In <i>GENETIC EPIDEMIOLOGY</i> , volume 39, pages 577–578, 2015
2009	Sheik Ahmed Ullah, Subrata Paul, and Md. Sharif Ullah Mozumder. On information carriage through sigma-algebra in binomial asset pricing model. <i>Journal of Statistical Studies</i> , 28:1–8, 2009

Awards

2018	Lynn Bateman Memorial Fellowship
2017	Travel award from SAMSI
2012-2013	Graduate Merit Fellowship, Ball State University.
2010	Provost Scholarship, Jagannath Hall, University of Dhaka, 2010

Presentations

- Oct 2018** Incorporation of Mixture Model into Association Studies
Statistical Genetics meeting, University of Colorado Denver.
- June 2017** Performance of a Polygenic Risk Score for Generalized Vitiligo
GRAYBILL conference, Colorado State Univeristy, CO.
- Mar 2017** My learnings from Advanced Gene Mapping Course
Statistical Genetics meeting, University of Colorado Denver.
- Mar 2016** Development of Polygenic Risk Scores for Vitiligo from a Genome-Wide Association Study
12th Annual SIAM Front Range Applied Mathematics Student Conference.

Teaching Experience:

- MATH 3800** Probability and Statistics for Engineers at *University of Colorado Denver.*
- MATH 2830** Introductory Statistics at *University of Colorado Denver*
- MATH 1070** Algebra for Social Sciences and Business at *University of Colorado Denver.*
- MATH 125** Mathematics and its application at *Ball State University*
- MATH 147** Calculus I at *IUBAT, Dhaka, Bangladesh*
- MATH 167** Calculus II at *IUBAT, Dhaka, Bangladesh*
- MATH 197** Differential Equations at *IUBAT, Dhaka, Bangladesh*
- MATH 207** Partial Differential Equation for Engineers at *IUBAT, Dhaka, Bangladesh*
- MATH 257** Discrete Mathematics for Engineers at *IUBAT, Dhaka, Bangladesh*

Educational Outreach

- Lesson and interactive activity on DNA, Brown International Academy, 4th Grade (May 2016 and 2017)
- Learning math in a fun way for 10th graders, Makahati G. C. High School, Bangladesh, (Multiple times a year from 2008 to 2010)