Harris Quach

Statistics · PhD Student

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harrisq.github.io | harrisq | harrisquach

Proficient in sufficient dimension reduction, generalized linear models, non-parametric estimation, likelihood and simulation-based inference. Working knowledge of hypothesis testing, Bayesian statistics, statistical computing, supervised and unsupervised learning. Mainly programs in R with some experience in C++; basic skills in MATLAB and Python.

Education

PhD in Statistics, 2016 - Present

The Pennsylvania State University, *3.88/4.0 GPA*

Advisor: Dr. Bing Li, Verne M. Willaman Professor of Statistics

Research Interests: Sufficient Dimension Reduction (SDR)

M.Sc. in Statistics, 2015 - 2016

University of Toronto, *3.93/4.0 GPA*

Research Focus: Composite Likelihood, Simulation-based Inference

M.A. in Economics, 2014 - 2015

University of Toronto, *3.66/4.0 GPA*

Research Focus: Econometric Theory, Higher-Order Likelihood

B.Sc.in Mathematics, 2009 - 2014

University of Toronto, *3.72/4.0 GPA*

Fields of study: Analysis, Mathematical Statistics, Econometrics

Relevant Experience

Research Assistant, The Pennsylvania State University

Jan 2021 - Ongoing

- Working with Dr. Bing Li, Verne M. Willaman Professor of Statistics on sufficient dimension reduction methods for functional data analysis.

Instructor, The Pennsylvania State University

May 2018 - Ongoing

- Instructor of record for Introductory Probability (STAT414 World Campus), Elementary Statistics (STAT200), Elementary Probability (STAT318); develop materials for conducting inverted and conventional lectures

Graduate Student Consultant, The Pennsylvania State University

Spring 2019, Fall 2017

- Advised undergraduate, graduate and faculty researchers at the statistical consulting center;
- Advised projects include: *posterior predictive models for personalized athlete training; variable selection for protein folding; nonlinear regression for errors in chemical processes*

Research Assistant, University of Toronto

Summer 2014, Summer 2016

- Summer 2016: Worked with Dr. Nancy Reid, Canada Research Chair, on Indirect Inference and Approximate Bayesian Computation
- Summer 2014: Worked with Dr. Nancy Reid, Canada Research Chair, on Conditional Inference for air particulate matter

Programming Skills

Proficient: R, LaTeX

Basic: MATLAB, Python, C++ (via Rcpp), Linux, MS Office

Research & Projects

Generalized Forward Sufficient Dimension Reduction

In Process of Submission

R , GLMs, Non-parametrics, Classification, Parallel Computing

- Propose a sufficient dimension reduction method with a focus on ordinal and categorical responses in classification problems.
- Provide some theoretical guarantees on the effectiveness of our proposed method.
- Introduce a novel tuning procedure for sufficient dimension reduction in classification problems.

Forward Nonlinear SDR for Functional Data

2021 - Ongoing

R , Non-parametrics, Functional Data, RKHS

- Exploring extensions of forward regression methods to functional response and predictors.

SDR for Approximate Bayesian Computation

Fall 2018 - Project

R, MCMC, Bayesian and Simulation Inference, Parallel Computing

- Explored using sufficient dimension reduction to construct informative summary statistics, in parallel, for simulated inference and Approximate Bayesian Computation via MCMC.

Optimal Transport for Sufficient Dimension Reduction

Fall 2017 - Project

MATLAB, Copulas

- Explored applying optimal transport methods for remedying distributional violations in applications of inverse regression for sufficient dimension reduction.

Presentations

Generalized Forward SDR for Classification

2021 - March 5

Stochastic Modeling And Computation (SMAC) Seminar. Penn State

Accurate Confidence Intervals for Small Clustered Data

2017

The Annual Statistical Society of Canada Conference. Meeting (Winnipeg, Canada). (Oral Presentation accepted; Masters Work)

Composite Likelihood and Indirect Inference

2016

The 4th Annual Statistical Society of Canada Student Conference. Meeting (St. Catherines, Canada). (Poster Presentation; Masters Work)