Asad Haris

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EDUCATION

University of Washington — Seattle, WA
Ph.D., Biostatistics — September 2013 – June 2018
Advisor: Ali Shojaie, Ph.D.
Dissertation Title: "Towards More Flexible Models in High Dimensions"

University of Washington — Seattle, WA
M.Sc., Biostatistics: Methods and Applications — September 2013 – June 2017

McGill University — Montreal, Quebec
B.Sc., Probability and Statistics (Honours) — September 2010 - May 2013
Advisor: Russell Steele, Ph.D.
Honours project: "A comparative study of Bayesian and Frequentist Modelling techniques for Inverse Probability Weighting"

RESEARCH INTERESTS

Targeted learning, machine learning, causal inference, high-dimensional data, non-parametric regression, and functional data analysis

PUBLISHED/ACCEPTED MANUSCRIPTS

- (2022) "Generalized Sparse Additive Models", **Asad Haris**, Noah Simon and Ali Shojaie (JMLR)
- (2018) "Wavelet Regression and Additive Models for Irregularly Spaced Data", **Asad Haris**, Noah Simon and Ali Shojaie (NeurIPS).
- (2018) "Nonparametric Regression with Adaptive Smoothness via a Convex Hierarchical Penalty", **Asad Haris**, Ali Shojaie and Noah Simon (Biometrika).
- (2015) "Convex Modeling of Interactions with Strong Heredity", **Asad Haris**, Daniela Witten and Noah Simon (Journal of Computational and Graphical Statistics).
- (2018) "Indian Ocean humpback dolphin (*Sousa plumbea*) estuary use patterns in Kochi harbor, India", Divya Panicker, **Asad Haris** and Dipani Sutaria (Marine Mammal Science).

SUBMITTED MANUSCRIPTS

- "The Treatment of Epilepsy in Younger and Older Adults: Demographic Differences and Prescribing Patterns of Anti-seizure Medications in Canada", **Asad Haris**, Kenan Bachour, Robert B Hopkins, Jean-Eric Tarride, and Mark R Keezer (Submitted to Epilepsy Research)
- "A TMLE-based approach to confounder selection for high-dimensional data", **Asad Haris** and Robert Platt (Submitted to Statistical Methods in Medical Research)

MANUSCRIPTS IN PROGRESS

- "Targeted Maximum Likelihood Estimation for Measurement Error Problems", **Asad Haris**, Robert Platt and Grace Yi
- "Data Enriched Generalized Linear models", Cheng Zheng, Sayan Dasgupta, Yuxiang Xie, **Asad Haris**, Ying Chen
- "Estimation of the Health Effects of Alternative Tobacco Products: How It Can Go Wrong", Daniel Szydlo, Gerald van Belle, Sandra I. Sulsky, **Asad Haris**, Susanne May

STATISTICAL COLLABORATION ON RESEARCH GRANTS

o "The Determinants of Cardiovascular disease in Epilepsy study", Mark Keezer, Colin Josephson, Roland Thijs, Ana Suller Marti, **Asad Haris** (To be re-submitted for CIHR 2022 competition)

o "Biomarkers for renal angiomyolipomas and epilepsy among people with tuberous sclerosis complex: a prospective,multicentre, longitudinal study", Mark Keezer, Andrew House, Catherine Larochelle, Philippe Major, David Rudko, An Tang, Nathalie Arbour, **Asad Haris**, Nicole Leclerc, Stephen Pautler, Rose-Marie Rébillard (CIHR grant submitted for Fall 2021/Spring 2022)

RESEARCH POSITIONS

Postdoctoral Fellow   Montreal, QC
Ali Ameli, Ph.D.   October 2018 – Present

Currently working with Dr. Ali Ameli, Prof. Will Welch and, Prof. Jiguo Cao in the department of Earth, Ocean, and Atmospheric Sciences at UBC. Our project aims to understand the relationship between vegetation mortality and climatic attributes. We are working with a massive dataset by considering climate and vegetation data across Canada from 1981 to 2020. We will develop novel techniques in the field of functional data analysis to account for the spatio-temporal nature of our data.

Statistical Collaborator   Montreal, QC
Mark Keezer, MDCM, Ph.D.   June 2019 – Present

Statistical collaborator for Dr. Mark Keezer in the Neurology department at CR-CHUM. Assisted Dr. Keezer with multiple grants by developing a statistical analysis plan, reviewing proposed methodology, calculating sample sizes for studies, and writing the statistical analysis plan. Additionally, I am collaborating on an applied project studying the distribution of epilepsy medication across Canada.

Postdoctoral Fellow   Montreal, QC
Robert Platt, Ph.D.   November 2018 – September 2021

Working in the Department of Epidemiology, Biostatistics and Occupational Health under the supervision of Prof. Robert Platt. Our first project focused on the confounder selection problem from a potentially large set of variables. Motivated by an existing, popular technique in pharmacoepidemiology, we developed a flexible framework for ranking confounder importance of variables or even groups of variables. We developed targeted maximum likelihood estimators (TMLE) for this task which we prove to be asymptotically normal, efficient, and doubly robust. Our second project, focused on extending the TMLE framework to data with measurement error. We developed a general result for calculating influence curves and consequently the TMLE algorithm. Currently, we are testing various computational techniques for parameter estimation which involves a multivariate, complex valued integrand.

Research Assistant   Seattle, WA
Susanne May, Ph.D.   September 2017 – January 2018

Revising and responding to peer review comments for the paper, "Estimation of the Health Effects of Alternative Tobacco Products: How It Can Go Wrong". The project included revising the previously submitted manuscript, responding to anonymous reviewer comments, running simulation studies.

Research Assistant   Seattle, WA
Ying Q. Chen, Ph.D.   September 2015 – August 2017

Researcher for the group of Dr. Ying Chen working on statistical issues in HIV/AIDS research. Our project, "Data-enriched generalized linear models", aimed to extend the existing work on linear regression models. For this project we developed methods for building an improved classifier based on a small accurate and larger biased sample.

Research Collaborator   Seattle, WA
UW medicine at SLU   August 2016 – August 2017

Statistical collaborator for an immunology project at UW medicine at south lake union. The collaboration consisted of data collected from a Phase I trial for a vaccine, our goal was to quantify immune response in two cohorts of subjects receiving the vaccine and those receiving an additional adjuvant. Additionally, the project involved analysis of flow cytometry data for multiple cell types.

Research Assistant   Seattle, WA
Gary Chan, Ph.D.   September 2014 - September 2015

RA work with Professor Gary Chan in causal inference and non-parametric statistics. During this time, we developed an efficient, publicly available R package for estimation of average treatment effect. In another project we addressed the problem of estimation of monotone hazard functions.

Research Assistant   Seattle, WA
Daniela Witten, Ph.D.   September 2013 - September 2014

Worked as an RA for Professor Daniela Witten and Noah Simon. Developed a convex framework for modeling interactions in regression models under strong heredity. Related paper published in the Journal of Computational and Graphical Statistics.

Research Assistant   Montreal, QC
David Stephens, Ph.D.   May 2013 - September 2013

The project was part of a larger project by Jewish General Hospital for analysis of longitudinal genetics data. The project aimed to create a good model for DNA methylation data.

Research Assistant   Montreal, QC
McGill University   May 2012 - August 2012

The research was based on the Summer Undergraduate Research Award (SURA) 2012 awarded by the faculty of Science at McGill University. The project was regarding implementation of Bayesian methods for Ordinary Differential Equation (ODE) models. I learned to implement numerous Markov Chain Monte Carlo (MCMC) methods to obtain estimates for ODE model parameters. Apart from the usual methods like Metropolis Hastings, I also implemented recent MCMC methods like Riemann Hamiltonian Monte Carlo. The second part of the project was concerned with improving the efficacy of the algorithms by using methods in Functional Data Analysis (FDA).

TEACHING EXPERIENCE

Course lecturer and coordinator   Montreal, QC
McGill University   September 2019 - December 2019

Lecturer for one section for the course MATH 141: Calculus II, in the Dept. of Mathematics and Statistics. As course coordinator I managed student issues, team of TAs, exams, and other administrative tasks across multiple sections of the course.

Course lecturer   Montreal, QC
McGill University   September 2019 - December 2019

Lecturer for graduate course on statistical software (EPIB 613: Intro to statistical software) in the Dept. of Epidemiology and Biostatistics. Apart from conducting weekly lectures, I administered assignments and end-of-term projects.

Teaching Assistant   Seattle, WA
University of Washington   March 2018 - June 2018

Teaching assistant for graduate level course on nonparametric regression and classification in the Dept. of Biostatistics. Duties included writing homework solutions, grading homework assignments, and giving some class lectures.

Teaching Assistant   Seattle, WA
University of Washington   March 2017 - June 2017

Teaching assistant for graduate level course on machine learning methods in the Dept. of Biostatistics. Duties included writing homework solutions, grading homework assignments, giving a few class lectures, and assisting students with their final projects.

Teaching Assistant   Seattle, WA
University of Washington   January 2017 - April 2017

Teaching assistant for multidisciplinary biostatistics course in the Dept. of Biostatistics. Duties included grading homework assignments, midterm, and final exams.

Teaching Assistant   Seattle, WA
University of Washington   September 2015 - December 2015

Teaching assistant for introductory biostatistics course in the Dept. of Biostatistics. Duties include leading discussion sections, writing solutions to and grading homework assignments and midterm exams.

Undergrad Student Assistant   Montreal, QC

McGill University   January 2013 - April 2013

Course Grader for Probability (MATH 323) and Statistics (MATH 324). Duties involved grading assignments and responding to students regarding courses material.

Undergrad Student Assistant   Montreal, QC
McGill University   September 2011 - April 2013

Course grader for Analysis 1 (MATH 242) and Honours Analysis 2 (MATH 255). Duties included grading course assignments and mid-term exams.

INVITED TALKS

- STATLAB 2021 fall meeting: "A Targeted Approach to Confounder Selection for High-Dimensional data.", October 2021
- Ryerson University, guest lecture: "Estimating Average Treatment Effects with R", November 2020.
- Statistical Society of Canada Conference: "A targeted approach to confounder selection for high-dimensional data.", May 2019.
- McGill University statistics seminar: "High-Dimensional Generalized Additive Models", January 2018.
- BIOST 562 guest lecture: "Optimization: proximal methods for non-smooth objectives", March 2017.
- BIOST 563 guest lecture: "Introduction to Rcpp and RcppArmadillo", August 2016.
- STAT 582 guest lecture: "The Square-root Lasso", February 2016.

OTHER PRESENTATIONS

- NeurIPS 2018: "Wavelet Regression and Additive Models for Irregularly Spaced Data", December 2018.
- IISA 2018: "High-Dimensional Generalized Additive Models", May 2018.
- WNAR 2018: "Nonparametric Regression with Adaptive Smoothness via a Convex Hierarchical Penalty", June 2017.
- Machine Learning working group presentation: "High-Dimensional Generalized Additive Models", October 2017.
- Machine Learning working group presentation: "Nonparametric Regression with Adaptive Smoothness via a Convex Hierarchical Penalty", August 2016.
- JSM 2016: "Nonparametric Regression with Adaptive Smoothness via a Convex Hierarchical Penalty", August 2016.
- Student Seminar and Fred Hutch Research Group meeting: "Data Enriched Regression", December 2015.
- JSM 2015: "Convex Modeling of Interactions with Strong Heredity", August 2015.
- Machine Learning working group presentation: "Improved Variable Selection with Forward-Lasso Adaptive Shrinkage by Peter Radchenko and Gareth M. James", March 2015.
- University of Washington- Microsoft Research Machine Learning Day: "Convex Modeling of Interactions with Strong Heredity" (Poster), February 2015.
- Bayesian methods to estimate the parameters of the FitzHugh-Magumo model (Poster), Winter 2012 CMS meeting

AWARDS & DISTINCTIONS

- 2020, STATLAB-CANSSI-CRM Post-doctoral Fellowship
- 2018, Shortlisted for student paper competition, IISA 2018
- 2013, First Class Honours (Probability and Statistics)
- 2013, Top 25% in graduating class, McGill University
- 2013, Canadian Mathematics Society President's Award, CMS winter meeting
- 2012, Summer Undergraduate Research Award
- 2012, Dean's Honour List, McGill University
- 2012, Herbert J Brennen Scholarship, McGill University
- 2010, Hugh Brock Entrance Scholarship, McGill University
- 2010, Entrance Scholarship, Department of Mathematics, University of Waterloo
- 2010, Entrance Scholarship, University of British Columbia
- 2010, Selected among top 6 for the Pakistan International Mathematical Olympiad (IMO) team

SOFTWARE

- **iHaz**: Increasing Hazard Function Estimation for Truncated and Censored Data. Available at https://github.com/asadharis/iHaz
- **ATE**: Nonparametric Estimation and Inference for Average Treatment Effects Based on Covariate Balancing. Available at https://github.com/asadharis/ATE
- **FAMILY**: A Convex Formulation for Modeling Interactions with Strong Heredity. Available on CRAN
- **HierBasis**: Nonparametric Regression and High Dimensional Additive Model via a Convex Hierarchical Penalty. Available at https://github.com/asadharis/HierBasis
- **GSAM:** Generalized Sparse Additive Model. Available at https://github.com/asadharis/GSAM
- **WaveMesh:** Wavelet Regression for Irregularly Spaced Data and Additive Models. R package available soon on github. Currently source code is available at https://github.com/asadharis/waveMesh-Code
- **hdCS:** High-dimensional confounder selection with TMLE. R package available soon on github and upon request.