Brian David Williamson — Curriculum Vitae — 2 May 2019

Contact Information

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Research Interests

Inference with high-dimensional data using targeted maximum likelihood estimation; data science; statistical machine learning; statistical methods for HIV/AIDS research

Education

Ph.D., Biostatistics, University of Washington — 2014–2019 (expected)

Committee: Marco Carone (co-chair), Noah Simon (co-chair), Scott Emerson, Carey Farquhar, Peter Gilbert

M.S., Biostatistics, University of Washington — 2017

B.A., Mathematics, Pomona College — 2014

Thesis adviser: Johanna Hardin

Funding

F31AI140836 (PI: Williamson) — 09/2018–09/2020

Ruth L. Kirschstein Predoctoral Individual National Research Service Award

Evaluating predictors of HIV vaccine efficacy: Statistical methods for estimation, testing, and inference

Honors and Awards

University of Washington Department of Biostatistics:

ASA Nonparametrics Section Travel Award for JSM 2019	04/2019
Excellence in Teaching Award	09/2018
ASA Biometrics Section Travel Award for JSM 2018	01/2018
WNAR Most Outstanding Oral Paper Award	06/2017
Biostatistics Department Conference Travel Award	06/2017
Graduate School Fund for Excellence and Innovation Travel Award	06/2017
Graduate and Professional Student Senate Travel Grant	06/2017
Top Scholar Incoming Student Award	09/2014

Pomona College:

Distinction in the Senior Exercise	05/2014
Inducted into Sigma Xi Scientific Research Honor Society	05/2014
Pomona-Pitzer Varsity Swimming and Diving Captain	2013–2014
All SCIAC Conference Academic Team	2013, 2014
All SCIAC Conference Swimmer	2013
UCLA DataFest Best Insight Award	06/2013

Research Experience

Fred Hutchinson Cancer Research Center, Seattle, Washington
Statistical Center for HIV/AIDS Research & Prevention (SCHARP)

Graduate Research Assistant 06/2015–Present

Advisor: James Hughes

Stanford University School of Medicine, Stanford, California

Integrative Cancer Biology Program Research Fellow 06/2013–08/2013

Advisors: Benedict Anchang and Sylvia Plevritis

Teaching Experience

University of Washington, Seattle, Washington

Pre-Doctoral Instructor (with Kelsey Grinde)

BIOST 311: Regression Methods in the Health Sciences 03/2018–06/2018

12 students [Overall median score = 4.9 out of 5; adjusted median score = 4.7 out of 5]

Faculty advisors: James Hughes and Barbara McKnight

Lead Graduate Teaching Assistant

BIOST 511: Medical Biometry I 09/2017–12/2017

Instructor: James Hughes

Co-instructor (with Gillian Tarr [2016], Jessica Williams-Nguyen [2017, 2018])

School of Public Health Math and R skills 09/2016, 09/2017, 09/2018
preparatory workshop (first offered 2016)

Advisor: Annette Fitzpatrick

Graduate Teaching Assistant

BIOST 311: Regression Methods in the Health Sciences 03/2017–06/2017

Instructor: Anna Plantinga

BIOST 571: Advanced Regression Methods for Dependent Data 01/2017–03/2017

Instructor: Adam Szpiro

R package development for introductory biostatistics courses 06/2014—06/2015

Advisor: Scott Emerson

Co-instructor

First Year Statistical Theory Exam Review Sessions 03/2016–06/2016

Advisor: Scott Emerson

Teaching Assistant

Summer Institute for Statistics for Big Data

Module 3, Reproducible Research for Biomedical Big Data 07/2017

Instructors: Keith Baggerly and Karl Broman

Module 2, Visualization of Biomedical Big Data 07/2016, 07/2017

Instructors: Dianne Cook and Heike Hofmann

Module 1, Accessing Biomedical Big Data 07/2015

Instructors: Jeff Leek and Raphael Gottardo

Guest Lecturer

BIOST 311: *Penalized regression and model selection*	06/2017
BIOST 561: *Unix, shell, and cluster computing*	10/2016, 10/2017
BIOST 511: *Lecture on regular course content*	11/2017

Pomona College, Claremont, California

Mentor/Teaching Assistant

MATH 58b: Introduction to Biostatistics	01/2014–05/2014
MATH 58: Introduction to Statistics	08/2013–12/2013
Instructor: Johanna Hardin	

Grader

MATH 58b: Introduction to Biostatistics	01/2013–05/2013
Instructor: Johanna Hardin	
MATH 31H: Honors Calculus II	08/2012–12/2012
Instructor: Shahriar Shahriari	

Publications

* denotes joint first-author contribution

7. **Williamson BD**, Gilbert PB, Simon N, and Carone M. Nonparametric variable importance assessment using machine learning techniques. *Biometrics*, 2019 (accepted)
6. *Magaret CA, *Benkeser DC, ***Williamson BD**, Borate BR, Carpp LN, Georgiev IS, Setliff I, Dingens AS, Simon N, Carone M, Simpkins C, Montefiori D, Alter G, Yu WH, Juraska M, Edlefsen PT, Karuna S, Mgodi NM, Edugupanti S, and Gilbert PB. Prediction of VRC01 neutralization sensitivity by HIV-1 gp160 sequence features. *PLOS Computational Biology*, 2019 (accepted)
5. Hanscom B, Hughes JP, **Williamson BD**, and Donnell D. Adaptive non-inferiority margins under observable non-constancy. *Statistical Methods in Medical Research*, 2018. doi: 10.1177/0962280218801134
4. *Feng J, ***Williamson BD**, Carone M, and Simon N. Nonparametric variable importance using an augmented neural network with multi-task learning. In *International Conference on Machine Learning*, volume 80, pages 1495–1504, 2018
3. Anchang B, Davis KL, Fienberg H, **Williamson B**, Bendall SC, Karacosta L, Tibshirani R, Nolan GP, and Plevritis SK. DRUG-NEM: optimizing drug combinations using single-cell perturbation response to account for intratumoral heterogeneity. *Proceedings of the National Academy of Sciences*, 115(18):E4294–E4303, 2018
2. Safren SA, Hughes JP, Mimiaga MJ, Moore AT, Friedman RK, Srithanaviboonchai K, Limbada M, **Williamson BD**, Elharrar V, Cummings V, Magidson JF, Gaydos CA, Celentano D, and Mayer KH for the HPTN063 Study Team. Frequency and predictors of estimated HIV transmissions and bacterial STI acquisition among HIV-positive patients in HIV care across three continents. *Journal of the International AIDS Society*, 19, 2016
1. Ritchwood TD, Hughes JP, Jennings L, MacPhail C, **Williamson B**, Selin A, Kahn K, Gómez-Olivé XF, and Pettifor A. Characteristics of age-discordant partnerships associated with HIV risk among young South African women (HPTN 068). *Journal of Acquired Immune Deficiency Syndromes*, 72:423–429, 2016

Software

`vimp`: R software for nonparametric variable importance (available on CRAN)

`vimpy`: python package for nonparametric variable importance (available on PyPI)

`uwIntroStats`: R software for introductory biostatistics students, developed with Scott Emerson M.D. Ph.D., Andrew Spieker Ph.D., Travis Hee Wai, and Solomon Lim (available on CRAN)

Presentations

"Assessing Variable Importance Nonparametrically using Machine Learning Techniques"

2018 *University of Washington Department of Biostatistics Colloquium*, Seattle, WA *(Invited speaker)*

Joint Statistical Meetings, Vancouver, BC, Canada (selected for an *ASA Biometrics Section Travel Award*)

2017 *Western North American Region (WNAR) of the International Biometric Society*, Santa Fe, NM (selected as the *Most Outstanding Oral Paper*)

University of Washington Statistical Learning Applied to Biostatistics Lab, Seattle, WA

2016 *University of Washington Department of Biostatistics Student Seminar*, Seattle, WA

"An Introduction to Targeted Learning"

2017 *University of Washington Department of Biostatistics Student Seminar*, Seattle, WA

"Shrinkage Estimators for High-Dimensional Covariance Matrices"

2014 *Pomona College Mathematics Seminar*, Clarement, CA

"Automating Cell Gating and Creating a Nested Effects Model to Compare Drug Effects"

2013 *Stanford University Center for Cancer Systems Biology Meeting*, Stanford, CA

Poster Presentations

4. **Williamson BD**, Magaret CA, Borate B, Carpp LN, Georgiev I, Setliff I, Dingens A, Benkeser DC, Simon N, Carone M, Simpkins C, Montefiori D, Alter G, Yu WH, DeCamp AC, Juraska M, Edlefsen PT, Karuna S, Edugupanti S, and Gilbert PB. HIV-1 Sequence Predictors of VRC01 Neutralization Sensitivity. 25th HIV Dynamics and Evolution Meeting. April 2018, Leavenworth, WA.
3. **Williamson B**, Gilbert P, Simon N, and Carone M. Assessing Variable Importance Nonparametrically using Machine Learning Techniques. University of Washington Biostatistics Department Retreat. November 2017, Seattle, WA.
2. **Williamson B**, Gilbert P, Simon N, and Carone M. Assessing Variable Importance Nonparametrically using Machine Learning Techniques. Joint Statistical Meetings. July 2017, Baltimore, MD.
1. **Williamson B**, Carone M, and Simon N. Assessing Variable Importance Nonparametrically. University of Washington Biostatistics Department Retreat. September 2015, Blaine, WA.

Professional Societies

Western North American Region of the International Biometric Society (WNAR)
Student Member 08/2014–Present

American Statistical Association
Student Member 03/2013–Present

Bernoulli Society
Student Member 03/2016–Present

University Service

University of Washington Department of Biostatistics

Member

Task force on professionalism 02/2019–Present

Student Member

Equity, Diversity, and Inclusion Committee 09/2016–Present

Educational Policy and Teaching Evaluation Committee (EPTEC) 09/2015–09/2018

Website Committee 03/2015–06/2015

Peer Mentor

Peer mentoring program 09/2016–Present

Co-organizer

Statistical Learning Applied to Biostatistics (SLAB) Lab 09/2016–09/2017

Professionally-related Service

Session Chair, "Quantification, Association Testing, and Integration of the Microbiome", WNAR/ENAR Invited Session, JSM 2017 08/2017

Alumni Mentor, SagePost 47 06/2015–Present

Statistical Consultant, Sierra Streams Institute, Nevada City, California 03/2016–06/2016

Technical Skills

Statistical packages: Advanced knowledge of R, basic knowledge of SAS and Stata

Languages: Proficient in Python

Applications: Advanced knowledge of LaTeX, Proficient in git + GitHub

Operating Systems: Advanced knowledge of Unix/Linux, Windows