Brian David Williamson Curriculum Vitae 15 July 2018

Contact Information

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Research Interests

Inference with high-dimensional data using targeted maximum likelihood estimation; data visualization; statistical machine learning; statistical methods for HIV/AIDS research research; statistical methods for genetic research; statistical methods for cancer research; statistical methods for neurological research; developing statistical packages

Education

University of Washington, Seattle, Washington
Ph.D., Biostatistics — 2014–2019 (expected)
M.S., Biostatistics — 2017
Advisors: Marco Carone, Ph.D. and Noah Simon, Ph.D.

Pomona College, Claremont, California
B.A., Mathematics — 2010–2014
Thesis: Shrinkage Estimators for High-Dimensional Covariance Matrices
Advisor: Johanna Hardin, Ph.D.

Honors and Awards

University of Washington Department of Biostatistics:

- ASA Biometrics Section Travel Award for JSM 2018 — January 2018
- WNAR Most Outstanding Oral Paper Award — June 2017
- Biostatistics Department Conference Travel Award — Spring 2017
- Graduate School Fund for Excellence and Innovation Travel Award — Spring 2017
- Graduate and Professional Student Senate Travel Grant — Spring 2017
- Top Scholar Incoming Student Award — September 2014

Pomona College:

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

Research Experience

Fred Hutchinson Cancer Research Center, Seattle, Washington
Statistical Center for HIV/AIDS Research & Prevention (SCHARP)
Graduate Research Assistant — Summer 2015 – Present
Advisor: James Hughes, Ph.D.

Stanford University School of Medicine, Stanford, California
Integrative Cancer Biology Program Research Fellow — Summer 2013
Advisors: Benedict Anchang, Ph.D. and Sylvia Plevritis, Ph.D.

Teaching Experience

University of Washington, Seattle, Washington

Pre-Doctoral Instructor (with Kelsey Grinde)

BIOST 311: Regression Methods in the Health Sciences — Spring 2018
12 students [Overall adjusted median score = 4.7 out of 5]
Faculty advisors: James Hughes, Ph.D. and Barbara McKnight, Ph.D.

Lead Graduate Teaching Assistant

BIOST 511: Medical Biometry I — Autumn 2017
Instructor: James Hughes, Ph.D.

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

School of Public Health Math and R skills preparatory workshop (first offered 2016) — Autumn 2016, 2017
Advisor: Annette Fitzpatrick, Ph.D.

Graduate Teaching Assistant

BIOST 311: Regression Methods in the Health Sciences — Spring 2017
Instructor: Anna Plantinga

BIOST 571: Advanced Regression Methods for Dependent Data — Winter 2017
Instructor: Adam Szpiro, Ph.D.

R package development for introductory biostatistics courses — Summer 2014–Summer 2015
Advisor: Scott Emerson, M.D. Ph.D.

Co-instructor

First Year Statistical Theory Exam Review Sessions — Spring 2016
Advisor: Scott Emerson, M.D. Ph.D.

Teaching Assistant

Summer Institute for Statistics for Big Data

Module 3, Reproducible Research for Biomedical Big Data — July 2017
Instructors: Keith Baggerly, Ph.D. and Karl Broman, Ph.D.

Module 2, Visualization of Biomedical Big Data — July 2016, 2017
Instructors: Dianne Cook, Ph.D. and Heike Hofmann, Ph.D.

Module 1, Accessing Biomedical Big Data — July 2015
Instructors: Jeff Leek, Ph.D. and Raphael Gottardo, Ph.D.

Guest Lecturer

BIOST 311: *Penalized regression and model selection* — Spring 2017
BIOST 561: *Unix, shell, and cluster computing* — Autumn 2016, 2017
BIOST 511: *Lecture on regular course content* — Autumn 2017

Pomona College, Claremont, California

Mentor/Teaching Assistant

MATH 58b: Introduction to Biostatistics — Spring 2014
MATH 58: Introduction to Statistics — Fall 2013
Instructor: Johanna Hardin, Ph.D.

Grader

MATH 58b: Introduction to Biostatistics — Spring 2013
Instructor: Johanna Hardin, Ph.D.

MATH 31H: Honors Calculus II — Fall 2012
Instructor: Shahriar Shahriari, Ph.D.

Publications

* denotes joint first-author contribution

7. *Magaret CA, *Benkeser DC, ***Williamson BD**, Borate BR, Carpp LN, Georgiev IS, Setliff I, Dingens AS, Simon N, Carone M, 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. 2018 (under review in *PLOS Computational Biology*)

6. **Williamson BD**, Gilbert PB, Simon N, and Carone M. Nonparametric variable importance assessment using machine learning techniques. *University of Washington Department of Biostatistics Working Paper Series*, (422), 2017 (under review in *Biometrics*)
5. Hanscom B, Donnell D, **Williamson B**, and Hughes JP. Adaptive non-inferiority margins under observable non-constancy. *University of Washington Department of Biostatistics Working Paper Series*, (417), 2017 (under review in *Statistical Methods in Medical Research*)
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

Presentations

"Assessing Variable Importance Nonparametrically using Machine Learning Techniques"

2018 *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 (SLAB) 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, 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.

Other Presentations

1. **Williamson B**, Carone M, and Simon N. Assessing Variable Importance Nonparametrically using Machine Learning Techniques. Sigma Xi Student Research Showcase. April 2017, https://briandwilliamson.tumblr.com/

Professional Societies

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

American Statistical Association
Student Member Autumn 2013 – Present

Bernoulli Society
Student Member Spring 2016 – Present

University Service

University of Washington Department of Biostatistics

Student Member
Educational Policy and Teaching Evaluation Committee (EPTEC) Autumn 2015 – Present

Peer Mentor
Peer mentoring program Autumn 2016 – Present

Co-organizer
Statistical Learning Applied to Biostatistics (SLAB) Lab Autumn 2016 – Autumn 2017

Student Member
Diversity Committee Autumn 2016 – Present

Student Member
Website Committee Spring 2015 – Summer 2015

Professionally-related Service

- *Session Chair*, "Quantification, Association Testing, and Integration of the Microbiome", WNAR/ENAR Invited Session, JSM 2017 August 2017
- *Alumni Mentor*, SagePost 47 Summer 2015 – Present
- *Statistical Consultant*, Sierra Streams Institute, Nevada City, California Spring 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)

Technical Skills

Statistical packages: Advanced knowledge of R, basic knowledge of SAS and Stata
Languages: Proficient in Python, basic knowledge of Java, C++, SML
Applications: Advanced knowledge of LaTeX, common Windows software, Proficient in git + GitHub
Operating Systems: Advanced knowledge of Unix/Linux, Windows

Professional Experience

Global Market Insite, Inc. (GMI), Bellevue, Washington
Intern Summer 2012