

CONTACT INFORMATION

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 Seattle, Washington 98195

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 Finanlist for JSM 2019 01/2019
 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: <i>Penalized regression and model selection</i>	06/2017
BIOST 561: <i>Unix, shell, and cluster computing</i>	10/2016, 10/2017
BIOST 511: <i>Lecture on regular course content</i>	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. *University of Washington Department of Biostatistics Working Paper Series*, (422), 2017 (under third round of review)
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*, Claremont, 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
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Student Member

Diversity Committee	09/2016–Present
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Educational Policy and Teaching Evaluation Committee (EPTEC)	09/2015–09/2018
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Website Committee	03/2015–06/2015
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Peer Mentor

Peer mentoring program	09/2016–Present
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Co-organizer

Statistical Learning Applied to Biostatistics (SLAB) Lab	09/2016–09/2017
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PROFESSIONALLY-RELATED SERVICE

<i>Session Chair</i> , “Quantification, Association Testing, and	08/2017
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Integration of the Microbiome”, WNAR/ENAR Invited Session, JSM 2017	
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<i>Alumni Mentor</i> , SagePost 47	06/2015–Present
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<i>Statistical Consultant</i> , Sierra Streams Institute, Nevada City, California	03/2016–06/2016
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TECHNICAL SKILLS

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

Languages: Proficient in Python

Applications: Advanced knowledge of L^AT_EX, Proficient in git + GitHub

Operating Systems: Advanced knowledge of Unix/Linux, Windows