

# CURRICULUM VITAE

Noah Simon  
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## 1. Biographical Information

Work Address:

University of Washington

Department of Biostatistics F-650 Health Sciences Building Box 357232  
Seattle, WA 98195

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## 2. Education

Pomona College, Claremont CA, B.A. Mathematics, 2008

Stanford University, Stanford CA, Ph.D., Statistics, 2013 *Advisor*: Prof. Robert Tibshirani

*Dissertation Title*: High Dimensional Interaction Testing and Estimation

## 3. Licensure Not applicable

## 4. Professional Positions

Graduate Student, Department of Statistics, Stanford University, 2008-2013

Assistant Professor, Department of Biostatistics, University of Washington 2013 - present

## 5. Honors, Awards, Scholarships

### Academic Awards and Honors

- Jaeger Prize in Mathematics from Pomona College (2005)
- Llewellyn Bixby Mathematics Prize from Pomona College (2006)
- TA Award from Department of Statistics, Stanford University (2009)
- National Science Foundation Graduate Research Fellowship Honorable Mention (2010)
- Yahoo Key Scientific Challenges Award (2012)
- Weiland Fellowship (2011-13)

### Popular Awards

- Forbes 30 under 30 in Science (2015)

## 6. Professional Activities (outside of UW)

### Data Monitoring Service:

Statistician on 5 Data Safety Monitoring Boards (including 1 as chair)

### Referee Service:

BMC Bioinformatics; Biometrika; Biostatistics; Biometrics; Journal of the American Statistical

Association (Theory and Methods); Journal of Computational and Graphical Statistics; Journal of Machine Learning Research; Journal of the Royal Statistical Society, Series B; Statistica Sinica; Statistical Applications in Genetics and Molecular Biology; Journal of Statistical Software; R Journal; Canadian Journal of Statistics; Annals of Statistics; Computational Statistics and Data Analysis, International Journal of Biostatistics; Annals of Applied Statistics, Neural Information Processing Systems; Statistics in Medicine; PLOS Genetics.

### Professional Memberships:

American Statistical Association, 2010-present  
International Chinese Statistical Association, 2013-present

### 7. Bibliography Refereed Research Articles

[\* indicates joint first authorship.]

[+ indicates UW student author who NS supervised or co-supervised on this paper.]

1. Garcia SR, Selhorst-Jones V, Poore DE, & **Simon N** (2011). Quotient Sets and Diophantine Equations. *American Mathematical Monthly*, 118(8), 704-711.
2. **Simon N**, Friedman JH, Hastie T, and Tibshirani R (2011). Regularization Paths for Cox's Proportional Hazards Model via Coordinate Descent. *Journal of Statistical Software*, 39(5), 1-13.
3. Simon R, and **Simon N** (2011). Using randomization tests to preserve type I error with response adaptive and covariate adaptive randomization. *Statistics & probability letters*, 81(7), 767-772.
4. Harshman L, Manda S, Hansel D, McKenney J, Oliveria V, **Simon N**, Dreicer R, Srinivas S, Bepler G, (2011). ERCC1 and RRM1 expression patterns in synchronous primary and metastatic urothelial cancer lesions. *Journal of Clinical Oncology* 29:2011 (suppl; abstr e15035)
5. Tibshirani R, Bien J, Friedman J, Hastie T, **Simon N**, Taylor J, and Tibshirani R (2012). Strong rules for discarding predictors in lasso-type problems. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 74(2), 245-266.
6. **Simon N**, and Tibshirani R (2012). Standardization and the group Lasso penalty. *Statistica Sinica*, 22(3), 983.
7. Witten DM, Friedman JH, and **Simon N** (2011). New insights and faster computations for the graphical lasso. *Journal of Computational and Graphical Statistics*, 20(4), 892-900.
8. Harshman L, Bepler G, Quinn D, McKenney J, Hawes D, **Simon N**, Srinivas S, Dorff (2012). Evaluation of ERCC1 and RRM1 as prognostic biomarkers in urothelial cancer (UC) treated with adjuvant platinum and gemcitabine chemotherapy *Journal of Clinical Oncology* 30,2012 (suppl; abstr e15005)
9. **Simon N**, Friedman J, Hastie T, and Tibshirani R (2012). A sparse-group lasso. *Journal of*

*Computational and Graphical Statistics*, 22.2 (2013): 231-245.

10. **Simon N**, and Simon R (2013). Adaptive enrichment designs for clinical trials. *Biostatistics*, 14.4 (2013): 613-625.

11. Furman D, Hejblum, B. P., **Simon N**, Jojic V, Dekker C L., Thiébaud R, ..., Davis, M. M. (2013). Systems analysis of sex differences reveals an immunosuppressive role for testosterone in the response to influenza vaccination. *Proceedings of the National Academy of Sciences*, 201321060.

12. Moore H E, Andlauer O, **Simon N**, Mignot E (2014). Exploring medical diagnostic performance using interactive, multi-parameter sourced receiver operating characteristic scatter plots. *Comp. in Bio. and Med.* 47: 120-129

13. Li X, Battle A, Karczewski KJ, Zappala Z, Knowles DA, Smith KS, Kukurba KR, Wu E, **Simon N**, Montgomery SB (2014). Transcriptome Sequencing of a Large Human Family Identifies the Impact of Rare Noncoding Variants. *American Journal of Human Genetics* 4;93(3):245-56.

14. Bien J, **Simon N**, and Tibshirani R (2015). Convex Hierarchical Testing of Interactions. *Annals of Applied Statistics*. 9(1): 27-42.

15. de Sisternes L, **Simon N**, Leng T, Tibshirani R, and Rubin D (2014). Quantitative SD-OCT Imaging Biomarkers as Indicators of Age-Related Macular Degeneration Progression *Investigative Ophthalmology and Visual Science*. 55(11):7093-7103

16. **Simon N**, Tibshirani R (2015). A Permutation Approach to Testing Interactions for Binary Response by Comparing Correlations Between Classes. *Journal of the American Statistical Association*.

17. **Simon N**, (2015). Adaptive Enrichment Designs: Applications and Challenges. *Future Medicine*. 5(4), 383-391

18. Haris A+, Witten D, **Simon N** (2016). Convex Modeling of Interactions with Strong Heredity. *Journal of Computational and Graphical Statistics*. 25:4, 981-1004

19. Petersen A+, Witten D, **Simon N** (2016). Fused Lasso Additive Model. *Journal of Computational and Graphical Statistics*. 25:4, 1005-1025.

20. Petersen A+, **Simon N**, Witten D (2016). Convex Regression with Interpretable Sharp Partitions. *Journal of Machine Learning Research*. 17, 1-31

21. Morrison J+, **Simon N**, Witten D (2017). Simultaneous Detection and Estimation of Trait

Associations with Genomic Phenotypes. *Biostatistics*. 18:1, 147-164.

22. Simon R, **Simon N**. (2017) Inference for Multimarker Adaptive Enrichment Trials. *Statistics in Medicine*. 36:26, 4083-4093.

23. **Simon N**, Simon R (2018). Using Bayesian Modeling in Frequentist Adaptive Enrichment Designs. *Biostatistics*. 19:1, 27-41.

24. Morrison J+, **Simon N** (to appear 2018). Rank Conditional Coverage and Confidence Intervals in High Dimensional Problems. *Journal of Computational and Graphical Statistics*.

25. Roth J+, **Simon N** (to appear 2018). A Framework for Estimating and Testing Qualitative Interactions with Applications to Predictive Biomarkers. *Biostatistics*.

26. Feng J+, **Simon N** (to appear 2018). Gradient-based Regularization Parameter Selection for Problems with Non-smooth Penalty Functions. *Journal of Computational and Graphical Statistics*.

27. Choi M, Genereux D, Goodson J, Al-Azzawi H, Allain S, **Simon N**, Palasek S, Ware C, Cavanaugh C, Miller D, Johnson W, Sinclair K, Stöger R, Laird C (2018). Epigenetic memory via concordant DNA methylation is inversely correlated to developmental potential of mammalian cells. *PLOS Genetics*. 6;13(11)

28. Petersen A+, **Simon N**, Witten D (to appear 2018). SCALPEL: Extracting Neurons from Calcium Imaging Data. *Annals of Applied Statistics*.

29. Feng J+, **Simon N** (to appear 2018). An Analysis of the Cost of Hyper-Parameter Selection via Split-Sample Validation with Applications to Penalized Regression. *Statistica Sinica*.

30. Feng J+, Williamson B, Carone M, **Simon N** (to appear 2018). Nonparametric Variable Importance Using an Augmented Neural Network with Multi-task Learning. *Proceedings of the International Conference on Machine Learning*.

### **Submitted Articles**

1. Haris A+, Shojaie A, **Simon N**. Nonparametric regression with adaptive truncation via a convex hierarchical penalty. (2<sup>nd</sup> round of review)

2. Feng J+, **Simon N**. Sparse-Input Neural Networks for High-dimensional Nonparametric Regression and Classification. (in review)

3. Williamson B+, **Simon N**, Carone M. Nonparametric variable importance assessment using machine learning techniques (2<sup>nd</sup> round of review)
4. Feng J,+ Shaw D, Minin V, **Simon N**, Matsen E. Survival analysis of DNA mutation motifs with penalized proportional hazards (in revision)
5. Haris A+, Shojaie A, **Simon N**. Wavelet regression and additive models for irregularly spaced data. (in review)
6. **Simon N**, Shojaie A. Convergence Rates of Nonparametric Penalized Regression under Misspecified Smoothness (in review)

### Refereed Book Chapters

1. **Simon N** (2017). Bayesian Utility-Based, Adaptive Enrichment Designs with Frequentist Error Control. *Frontiers of Biostatistical Methods and Applications in Clinical Oncology*. Springer. Editors: John Crowley and Shige-yuki Matsui.

### Patents and Other Intellectual Property

#### Publicly Available Software

1. **sgl**, an R library for fitting the sparse group lasso for a variety of losses, available at "<http://cran.r-project.org/>"<http://cran.r-project.org/web/packages/SGL/index.html>.
2. **standGL**, an R library for fitting the standardized group lasso (and ridged-group lasso) available at <http://cran.r-project.org/web/packages/standGL/index.html>.
3. **Interact**, an R library for testing for interactions in high dimensions with binary response (with FDR estimates based on permutations), available at <http://cran.r-project.org/web/packages/Interact/index.html>.

### 9. Funding History

1. NIH Director's Early Independence Award; Role: PI; 1 DP5OD019820-01  
Title: "Data-Driven Statistical Learning, with Applications to Genomics"  
9/18/2014 – 2019; \$250,000/year in direct costs
2. Google Computing Grant; Role: PI;  
Title: "Detecting Differentially Methylated Regions in Developing Muscle Cells"  
2/16/2015 – 2016; \$5000 computing costs on google compute engine.
3. NSF conference Grant; Role: co-PI; 1506255

Title: "17<sup>th</sup> IMS New Researchers Conference"  
6/15/2015 – 5/31/2016; \$23,000 in costs

4. NIH conference Grant; Role: co-PI; 1R13CA200282-01  
Title: "17<sup>th</sup> IMS New Researchers Conference"  
7/17/2015 – 6/30/2016; \$16,140 in direct costs

5. Amazon Computing Grant; Role: PI;  
Title: "Biomarkers Which Inform Treatment: Searching for Qualitative Interactions"  
10/2015 – 2016; \$8500 computing costs on AWS.

6. DoD Award; Role: Co-I; BTA 1 BC170516  
Title: " Commensal bacteria with high homology to non-mutated tumor antigens may prevent clinically effective vaccination in breast cancer"  
4/30/18 – 2020; \$214,062 in direct costs

**10. Public Health Practice Activities (None)**

**11. Conferences and Symposiums**

**Contributed Oral Presentations**

1. *Coordinate Descent For Lasso Problems: The good, the bad, and the ugly*. JSM, Miami, FL. (08/11)
2. *The Sparse-group Lasso and Structured Learning: Sometimes Less is More*. Stanford Department of Statistics Industrial Affiliates Meeting. Stanford, CA. (03/11)
3. *Adaptive Enrichment in Clinical Trials and A/B Testing*. Stanford Department of Statistics Industrial Affiliates Meeting. Stanford, CA. (03/13)

**Invited Oral Presentations and Seminars**

1. *Permutation Approach to High Dimensional Interaction Testing*. Stanford University, Workshop in Biostatistics, Department of Health Research & Policy. Stanford, CA. (10/12)
2. *A Permutation Approach to High Dimensional Interaction Testing*. University of California at Berkeley, Biostatistics Seminar, Department of Biostatistics. Berkeley, CA. (11/12)
3. *A Permutation Approach to High Dimensional Interaction Testing*. University of California at Davis, Statistics Seminar, Department of Statistics. Davis, CA. (1/13)
4. *A Permutation Approach to High Dimensional Interaction Testing*. University of Washington, Biostatistics Seminar, Department of Biostatistics. Seattle, WA. (2/13)
5. *A Sparse-group Lasso, Computation, and GPUs*. JSM, Montreal, Canada. (8/13)
6. *Estimating Many Effect-sizes Bayesian Estimation as a Frequentist*. Statistical Data Integration Challenges in Computational Biology: Regulatory Networks and Personalized Medicine, Banff, Canada

(8/13)

7. *Adaptive Enrichment Designs for Clinical Trials*. Bayesian Biostatistics and Bioinformatics Conference 2014. The University of Texas, and M.D. Anderson. Houston, Texas. (2/14)

8. *Adaptive Enrichment Designs for Clinical Trials*. Pacific Coast Statisticians and Pharmacometricians Innovation Conference. Cal Poly San Luis Obispo. San Luis Obispo, CA. (2/14)

9. *Adaptive Enrichment Designs for Clinical Trials*. Eastern North American Region Meeting. Baltimore, MD. (3/14)

10. *Adaptive Enrichment Designs for Clinical Trials*. International Chinese Statistics Association Meeting. Portland, OR. (6/14)

11. *Adaptive Enrichment Designs for Clinical Trials*. International Indian Statistics Association Meeting. Riverside, CA. (7/14)

12. *Workshop on Building Biomarkers using High Dimensional Data*. Deming Conference, Atlantic City, NJ (12/14)

13. *Learn and confirm phase 3 clinical trials*. Takeda Pharmaceutical. Deerfield IL. (12/14)

14. *A Flexible Framework for Sparse Additive Modeling*. Eastern North American Region Meeting, Miami, FL. (3/15)

15. *Adjusting Point Estimates and Confidence Intervals for Selection Bias in High Dimensions as a Frequentist*. Workshop on Statistical Inference for Large Scale Data, Vancouver, Canada. (4/15)

16. *Stratification Free Adaptive Enrichment*. International Chinese Statistics Association Meeting. Fort Collins, CO. (6/15)

17. *Selection Bias in Adaptive Enrichment Designs*. JSM, Seattle WA (8/15)

18. *Correcting for Selection Bias in High-Throughput Experiments*. Department of Genome Sciences Seminar, University of Washington (10/15)

19. *Adaptive Enrichment Designs for Clinical Trials*. Biomath Group Department Seminar, Fred Hutchinson (10/15)

20. *Additive Modeling in High Dimensions (estimation and testing)*. Department of Biostatistics Seminar, University of Pennsylvania (10/15)

21. *Adaptive Enrichment Trials for Biomarker Guided Treatments*. Department of Biostatistics, Stanford University (1/16)

22. *A Frequentist Adjustment for Selection Bias*. Department of Biostatistics, UC Berkeley (1/16)

23. *Adaptive Enrichment Designs for Clinical Trials*. Department of Biostatistics Seminar, Vanderbilt University (4/16)

24. *Frasian Biomarker Designs for Randomized Trials with Adaptive Enrichment*. Department of Biostatistics Seminar, Johns Hopkins University (5/16)

25. *Adaptive Enrichment Trials for Biomarker Guided Treatments*. Western North American Regional Meeting, Victoria, Canada (6/16).
27. *Adaptive Enrichment Trials for Biomarker Guided Treatments*. JSM, Chicago (8/16).
28. *Additive Modeling in High Dimensions (Computation and Theory)*. Computational and Methodological Statistics Conference, Seville Spain (12/16)
29. *Adaptive Enrichment Trials for Biomarker Guided Treatments*. International Chinese Statistics Association Meeting. Shanghai, China. (12/16).
30. *Optimization in Sparse Additive Models*. SIAM conference on optimization, Vancouver, Canada (4/17)
31. *A Fireside Chat about Precision Medicine and a [somewhat] more informed discussion of Stratification Free Adaptive Enrichment*. IMS Singapore Workshop: Quantitative Methods for Drug Discovery and Development. Singapore (7/17)
32. *Correcting for Selection Bias*. IMS Singapore Workshop: Quantitative Methods for Drug Discovery and Development. Singapore (7/17)
33. *Sparse Additive Modeling*. NUS Statistics Departmental Seminar. Singapore (7/17)
34. *Optimization in Sparse Additive Models*. NUS Mathematics Seminar. Singapore (7/17)
35. *Precision Medicine and Stratification Free Adaptive Enrichment*. Genome Institute of Singapore Seminar. Singapore (7/17)
36. *Building and Evaluating Predictive Biomarkers for Observational Data*. Duke-NUS department Seminar. Singapore (7/17)
37. *Stratification Free Adaptive Enrichment*. Joint Conference on Biometrics & Biopharmaceutical Statistics. Vienna, Austria (8/17)
38. *Sparse Additive Modeling*. Pomona College Mathematics Seminar. Claremont, CA (10/17)
39. *Empirical Bayes, Selection Bias, and the Bootstrap*. TGS Management Seminar. Irvine, CA (12/17)
40. *Sparse, Non-parametric Regression*. SAMSI Workshop on Optimization and Statistics. Research Triangle, NC (3/18)
41. *Biomarker Guided Clinical Trial Design*. Seminar at GRAIL inc. Palo Alto, CA (3/18)
42. *Sparse Additive Modeling and Misspecified Smoothness*. UW Biostatistics Department Seminar. Seattle WA (4/18).
43. *Challenges in the Development and Evaluation of Biomarkers*. International Chinese Statistical Association Data Science Conference. Qindao, China (invited for 6/2018)
44. *Statistical and Computational Connections in High Dimensional Modeling*. Computational and Methodological Statistics Conference. Pisa Italy (invited for 12/2018)



**12. University Service:**

**Department of Biostatistics**

- Diversity Committee, Member (2014-2015), Chair (2016-present)
- Admissions Committee, Member (2014-present)
- Communications committee, Member (2014)
- MS theory committee, Member (2014)
- Department Seminar Organizer (2014 & 2017)
- PhD Theory Committee (2015-present)
- Student-Faculty Relations Committee (2016-2017)

**School of Public Health**

- Diversity Committee Member (2015-present)
- Anti-racism Training Working Group, Chair (2015-present)

**13. Professionally-Related Community Service:** None

**14. [Other Pertinent Information As Needed]**

**Other Work Experience:**

- Research Intern at Genentech, San Francisco CA (Summer 2008)

**15. Teaching History**

**Formal Courses at The University of Washington**

- BIOST 561 Computational Tools for Biostatistics I  
Enrollment 33 (Fall 2013)  
Enrollment 21 (Fall 2014)
- BIOST 562 Computational Tools for Biostatistics II  
Enrollment 21 (Winter 2014)  
Enrollment 20 (Winter 2015)
- BIOST 527 Nonparametric Estimation and Classification  
Enrollment 32 (Spring 2016)
- BIOST 544 Introduction to Biomedical Data Science  
Enrollment 18 (Spring 2017)  
Enrollment 23 (Spring 2018)

**Independent Study**

- Brenda Price (Fall 2013 – Fall 2014)
- Jeremy Roth (Winter 2014 – Winter 2015)
- Katie Wilson (Fall 2014 – Winter 2015)
- Anna Plantinga (Fall 2014)
- Brayan Ortiz (Fall 2014 – Winter 2015)
- Phuong Vu (Fall 2014)
- Yatong Li (Fall 2014)
- Subodh Selukar (2017)
- Travis Hee Wai (2017)
- Yichen Zhang (2017)

### **Formal Courses at Stanford University**

- Statistics 390, Consulting Workshop
- Enrollment 6 (Summer 2010)
- Enrollment 5 (Summer 2011)
- Enrollment 24 (Winter 2011)
- Enrollment 8 (Summer 2012)
- Enrollment 17 (Fall 2012)

### **Teaching Assistantships at Stanford University**

- Statistics 60, Introduction to Statistics  
Winter 2008, Summer 2009, Fall 2009, Spring 2010
- Statistics 191, Introduction to Applied Statistics (Winter 2010)
- Statistics 306B, Unsupervised Statistical Learning (Winter 2011)
- Statistics 290, Statistical Computing (Fall 2011)
- Statistics 306a, Exponential Families (Winter 2012)

## **16. Advising and Formal Mentoring**

### **Thesis Advising**

- Ashley Petersen, Biostatistics PhD student (co with Daniela Witten – graduated 2016)
- Brayan Ortiz, Biostatistics PhD student
- Jeremy Roth, Biostatistics PhD student
- JooYoon Han, Biostatistics MS student (co with Andrew Zhou – graduated 2016)
- Jean Morrison, Biostatistics PhD student (graduated 2016)
- Brian Williamson, Biostatistics PhD student (co with Marco Carone)
- Jean Feng, Biostatistics PhD student
- Yichen Zhang, Biostatistics MS student

### **Project Supervision**

- Jean Feng, Biostatistics PhD student
- Asad Harris, Biostatistics PhD student
- Anna Plantinga, Biostatistics PhD student
- Katie Wilson, Biostatistics PhD student
- Richard Robinson, Mathematics PhD student
- Phuong Vu, Biostatistics PhD student
- Tianyu Zhang, Biostatistics MS student
- Yunhua Xiang, Biostatistics PhD student