

# BRYAN D. MARTIN

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## CONTACT INFORMATION

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## EDUCATION

**University of Washington**, Seattle, Washington  
Ph.D. Statistics Candidate

- Research topic: Statistical methods for compositional data, applied to the microbiome
- Advisors: Daniela Witten and Amy Willis
- Coursework: Applied regression analysis, Bayesian statistics, cluster analysis, convex optimization, data ethics, spatial statistics, statistical computing, statistical inference, statistical machine learning, stochastic modeling

**Macalester College**, St. Paul, Minnesota

B.A. Honors Applied Mathematics & Statistics (summa cum laude), May 2015

B.A. Economics (summa cum laude), May 2015

- Coursework: Bayesian statistics, econometrics, mathematical statistics, numerical analysis, probability, real analysis, signal processing

## PUBLICATIONS

1. Amy D Willis and **Bryan D Martin**. Estimating diversity in networked ecological communities. *Biostatistics*, 2020
2. **Bryan D Martin**, Daniela Witten, and Amy D Willis. Modeling microbial abundances and dysbiosis with beta-binomial regression. *Annals of Applied Statistics*, 14(1):94–115, 2020
3. Hayden S Hayden<sup>+</sup>, Alexander Eng<sup>+</sup>, Christopher E Pope, Mitchell J Brittnacher, Ahn T Vo, Eli J Weiss, Kyle R Hager, **Bryan D Martin**, Daniel Leung, Sonya Heltshe, Elhanan Borenstein\*, Samuel I Miller\*, and Lucas R Hoffman\*. Fecal dysbiosis in infants with cystic fibrosis is associated with early somatic growth failure. *Nature Medicine*, pages 1–7, 2020
4. Evan Bolyen, Jai Ram Rideout, Matthew R Dillon, Nicholas A Bokulich, [105 others, including **Bryan D Martin**], Rob Knight, and J Gregory Caporaso. QIIME 2: Reproducible, interactive, scalable, and extensible microbiome data science. *Nature Biotechnology*, 37(8):852–857, 2019
5. Zehang Li, Yuan Hsiao, Jessica Godwin, **Bryan D Martin**, Jon Wakefield, and Samuel J Clark. Changes in the spatial distribution of the under-five mortality rate: Small-area analysis of 122 DHS surveys in 262 subregions of 35 countries in Africa. *PLoS One*, 14(1):e0210645, 2019
6. Nicolas Tromas, Zofia E Taranu, **Bryan D Martin**, Amy Willis, Nathalie Fortin, Charles W Greer, and B Jesse Shapiro. Niche separation increases with genetic distance among bloom-forming cyanobacteria. *Frontiers in Microbiology*, 9:438, 2018
7. **Bryan D Martin**, Vittorio Addona, Julian Wolfson, Gediminas Adomavicius, and Yingling Fan. Methods for real-time prediction of the mode of travel using smartphone-based GPS and accelerometer data. *Sensors*, 17(9):2058, 2017

## SUBMITTED MANUSCRIPTS & PREPRINTS

1. Zehang Richard Li, **Bryan D Martin**, Tracy Qi Dong, Geir-Arne Fuglstad, John Paige, Andrea Riebler, Samuel Clark, and Jon Wakefield. Space-time smoothing of demographic and health indicators using the R package SUMMER. *arXiv preprint arXiv:2007.05117*, 2020

INVITED  
CONFERENCE  
PRESENTATIONS

1. **Bryan D Martin**, Daniela Witten, and Amy D Willis. *corncob*: Statistical modeling of microbial abundances and dysbiosis with beta-binomial regression. In *Joint Statistical Meetings*, Seattle, WA, August 2021
2. **Bryan D Martin**, Daniela Witten, and Amy D Willis. *corncob*: modeling microbial abundances and dysbiosis. In *Fourth Workshop on Statistical and Algorithmic Challenges in Microbiome Data Analysis (SACMDA4)*, San Diego, CA, April 2020\*  
\* Cancelled due to COVID-19
3. **Bryan D Martin** and Amy Willis. Inference for diversity under networked models. In *Symposium on Data Science & Statistics*, Bellevue, WA, May 2019
4. **Bryan D Martin**. Machine learning algorithms for predicting mode of transportation using smartphone sensor data. In *Undergraduate Statistics Project Competition (USPROC) E-Conference*, October 2015. (Plenary speaker)

CONTRIBUTED  
CONFERENCE  
PRESENTATIONS

1. Thomas N Serrano and **Bryan D Martin**. *mRkov*: a statistical tool to scrape and imitate Twitter activity. In *University of Washington Undergraduate Research Symposium*, Seattle, WA, May 2020
2. Elena Erosheva, **Bryan D Martin**, and Ross L Matsueda. Trajectory models revisited. In *Joint Statistical Meetings*, Baltimore, MD, August 2017
3. **Bryan D Martin**, Elena Erosheva, and Ross L Matsueda. A comparison of group-based trajectory modeling techniques. In *The American Society of Criminology Annual Meeting*, New Orleans, LA, November 2016
4. **Bryan D Martin**, Anya Phillips, Heather Berlin, Mitchell Kinney, and Lindsey Schadler. *SmarTrAC*: Activity detection with smartphone sensor data. In *Joint Meeting in Mathematics*, San Antonio, TX, January 2015. (Poster presentation)

SOFTWARE

1. **Bryan D Martin**, Daniela Witten, and Amy D Willis. *corncob*: Count Regression for Correlated Observations with the Beta-Binomial, 2020. R package version 0.1.0. <https://github.com/bryandmartin/corncob>  
**Availability:** [GitHub](#)
2. Thomas N Serrano and **Bryan D Martin**. *mRkov*: a statistical tool to scrape and imitate Twitter activity, 2020. R package version 0.1.0. <https://github.com/serrat839/mRkov>  
**Availability:** [Shiny web app](#) and [GitHub](#)
3. **Bryan D Martin**, Zehang R Li, Yuan Hsiao, Jessica Godwin, Jon Wakefield, and Samuel J Clark. *SUMMER: Spatio-Temporal Under-Five Mortality Methods for Estimation*, 2019. R package version 0.2.2. <https://CRAN.R-project.org/package=SUMMER>  
**Availability:** [CRAN](#) and [GitHub](#)
4. Amy D Willis and **Bryan D Martin**. *DivNet: Diversity Estimation in Networked Ecological Communities*, 2018. R package version 0.3.1. <https://github.com/adw96/DivNet>  
**Availability:** [GitHub](#)
5. Amy Willis, **Bryan D Martin**, Pauline Trinh, Kathryn Barger, and John Bunge. *breakaway: Species Richness Estimation and Modeling*, 2018. R package version 4.6.8. <https://adw96.github.io/breakaway>  
**Availability:** [GitHub](#)

RESEARCH  
EXPERIENCE

**University of Washington**, Seattle, Washington

Research Assistant, May 2017–Present

- Advisors: Daniela Witten and Amy Willis
- Model development and statistical inference for compositional data applied to the microbiome

**University of Washington**, Seattle, Washington

Research Assistant, January 2017–May 2017

- Advisor: Jon Wakefield
- Space-time modeling for small-area under-five mortality estimation using complex survey data

**University of Washington**, Seattle, Washington

Research Assistant, January 2016–January 2017

- Advisor: Elena Erosheva
- Unimodal mixed membership trajectory modeling

**Macalester College Department of Statistics**, St. Paul, Minnesota

Statistics Honors Thesis, May 2014–May 2015

- Advisor: Vittorio Addona
- Classification method for mode of transportation data using combinations of dictionary learning, classification algorithms, and dimension reduction techniques

TEACHING  
EXPERIENCE

**University of Washington**, Seattle, WA

**Instructor of Record**, Winter 2020, Fall 2020, Winter 2021, Spring 2021

- Statistics 302: Statistical Computing
- Designed and implemented curriculum, course materials, and course webpage
- Adjusted combined median teaching evaluation rating: 4.6/5
- Topics: Programming fundamentals, data visualization, data manipulation, hypothesis testing, statistical models, debugging, version control, statistical prediction
- Course webpage: [Link](#)
- Remote in Fall 2020

**University of Washington**, Seattle, WA

**Instructor of Record**, Summer 2020

- Statistics 311: Elements of Statistical Methods
- ~180 students, remote due to COVID-19
- Managed team of 3 TAs and 2 graders
- Adjusted combined median teaching evaluation rating: 4.7/5
- Topics: data fundamentals, programming fundamentals, probability, foundations for statistical inference, hypothesis testing

**Marine Biological Laboratory**, Woods Hole, MA

Research Facilitator, July–August (2018, 2019, 2020\*)

\* Invited but cancelled due to COVID-19

- Strategies and Techniques for Analyzing Microbial Population Structures (STAMPS)
- Teach coding, data analysis methodologies, and statistical thinking to established investigators, postdoctoral fellows and advanced graduate students from biological fields

**University of Washington**, Seattle, Washington

Statistics Tutor, September 2015–March 2018

- Drop-in tutoring provided for students in all undergraduate statistics courses, as well as related courses in other departments

**University of Washington**, Seattle, Washington  
Teaching Assistant, September 2015–May 2016

- Statistics 221: Statistical Concepts & Methods for the Social Sciences

**Macalester College**, St. Paul, Minnesota

Supplemental Instructor, August 2014–December 2014

- Economics 361: Intermediate Microeconomic Analysis
- Planned and taught an optional supplementary two-hour weekly lecture on Sundays, maintained an average attendance of 60% of total enrollment
- Created practice problems and study exercises for students

**Macalester College**, St. Paul, Minnesota

Undergraduate Teaching Assistant, September 2013–May 2014 &amp; January 2015–May 2015

- Mathematics 254: Probability and Mathematical Statistics
- Economics 361: Intermediate Microeconomic Analysis
- Economics 119: Principles of Economics

## MENTORSHIP

**University of Washington**, Seattle, Washington

Statistics Undergraduate Directed Reading Program, January 2020–March 2020

- Mentee: Thomas Serrano
- Project: mRkov: a statistical tool to scrape and imitate Twitter activity
- Presented at the UW Undergraduate Research Symposium, May 2020
- Shiny web app: [Link](#)
- Directed Reading Program website: [Link](#)

**Electronic Undergraduate Statistics Research Conference (eUSR)**

Graduate School Information Session, November 2019

- Invited panelist

HONORS AND  
AWARDS

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|--------------|--|
| 2016–Present | NSF Graduate Research Fellow   |
| 2017         | University of Washington Center for Statistics and the Social Sciences Grant   |
| 2015         | University of Washington Department of Statistics Top Scholar Award  |
| 2015         | Third place in national Undergraduate Statistics Research Competition (USRESP)   |
| 2015         | Konhauser Achievement Award in Mathematics<br>( <i>Department of Mathematics, Statistics, and Computer Science, Macalester College</i> ) |
| 2015         | Vasant Sukhatme Academic Excellence Award in Economics<br>( <i>Department of Economics, Macalester College</i> )                         |
| 2015         | Phi Beta Kappa ( <i>honors society for the liberal arts</i> )  |
| 2014         | John M. Dozier Scholarship in Economics<br>( <i>Department of Economics, Macalester College</i> )  |
| 2014         | Omicron Delta Epsilon ( <i>honors society for economics</i> )  |
| 2011–2015    | DeWitt Wallace Distinguished Scholarship ( <i>Macalester College</i> )   |
| 2011–2015    | Macalester College Dean's List (all semesters)   |
| 2011–2015    | National Merit Scholarship   |
| 2011–2015    | Elks National Foundation Scholarship ( <i>national scholarship</i> )   |

## SKILLS

**Advanced:** R, LaTeX**Intermediate:** Bash**Basic:** Python, C++, HTML, MATLAB, Mathematica, Excel, Stata

## SERVICE

- Reviewer for *Microbiome* and *Frontiers in Genetics*
- UW Statistics Department Directed Reading Program Organizing Committee (2020–present)
- UW Statistics Department Diversity, Inclusion, Community, and Equity Committee (2017–present)
- UW Statistics Department PhD student peer mentor (2017–present)
- UW Statistics Department Graduate Student Representative (2018–2019)
- UW Statistics Department Admissions Screening Committee (2018)
- UW Statistics Department Website Committee (2017)

## RELEVANT ACTIVITIES

- UW Statistical Diversity Lab member (2018–present)
- UW Statistical Learning Applied to Biostatistics Lab member (2017–2018)
- Macalester College Students for Education Reform Board Member (2013–2015)
- Macalester College Students for Economic Justice Organizer (2014)
- Macalester College slacklining organization founder and president (2014–2015)