Anna Neufeld

Contact Information

Department of Statistics
University of Washington
Padelford B-222
Seattle, WA, 98195

aneufeld@uw.edu
https://anna-neufeld.github.io

Education

University of Washington, Seattle, Washington. 2018-Present
Statistics PhD Candidate

Williams College, Williamstown, MA 2014-2018
BA in Mathematics (Highest Honors) and Computer Science.
Summa Cum Laude

Research Experience

Research Assistant (University of Washington) 2020-Present

- Advisor: Daniela Witten
- Working on methods for testing data-driven hypotheses in the context of regression trees and differential expression analysis for single cell RNA-sequencing data. Also working on methods for cross-validation in unsupervised learning contexts, where the typical method of splitting the observations does not apply.

Williams College Undergraduate Honors Thesis 2017-2018

- Advisor: Brianna Heggeseth
- Proposed using longitudinal regression trees to study the impact of early exposure to environmental pollutants on the shape of body mass index trajectories later in life. After developing novel evaluation metrics to measure the "shape-based" accuracy of a tree, developed a spline projection method that groups individuals by the shape of their individual trajectory while ignoring the level of their trajectory.

SMALL Research Experience for Undergraduates Summer 2016

- Advisors: Julie Blackwood and Lauren Childs
- Used compartmental differential equation models to quantify the relative contributions of sexual transmission and vector transmission in the spread of the Zika virus.

Teaching Experience

Visiting Lecturer Spring 2021
Williams College Department of Computer Science

- Co-instructed CS 374T, Machine Learning, with Prof. Andrea Danyluk
- Tutorial style course (modeled after Oxford University tutorials), which involves meeting with two students at a time. 10 total students enrolled in the course.

Instructor of Record Summer 2019
University of Washington Department of Statistics

- Stat 311: Elements of Statistical Methods
- $\sim$60 students

Head Teaching Assistant Autumn 2019, Winter 2020
University of Washington Department of Statistics

- Stat 311: Elements of Statistical Methods
- Developed lab assignments, maintained lab website, helped write assignments and exams, served as liaison between professor and other TAs.
- ∼180 students total.
- Led two lab sections of 30 undergraduates each.

Graduate Teaching Assistant 2018-2020
University of Washington Department of Statistics
- Stat 570: Regression methods for independent data (Autumn 2021)
- Stat 527: Nonparametric Regression (Spring 2021)
- Stat 311: Elements of Statistical Methods (Autumn 2018, Spring 2020)
- Stat 423: Applied Regression and Analysis of Variance (Winter 2019)
- CSE/Stat 416: Introduction to Machine Learning (Spring 2019).

Undergraduate Teaching Assistant September 2015 - May 2018
Williams College Departments of Computer Science, Mathematics, and Statistics
- Data Structures and Advanced Programming (Fall 2015), Linear Algebra (Spring 2016, Spring 2017), Abstract Algebra (Fall 2016), Regression and Forecasting (Fall 2017, Spring 2018)
- Duties included grading homework, holding office hours, and running review sessions.

Workshop Leader January 2018
Williams College Office of Academic Resources
- Worked with a group of undergraduates and the Office of Academic Resources to pilot a new program of coding workshops
- Taught a series of workshops in R to undergraduates from a variety of departments and graduate students from the Center for Development Economics.

Peer Tutor 2016-2018
Williams College Office of Academic Resources
- Nominated by faculty to serve as a peer tutor. Held one-on-one and drop-in tutoring sessions for microeconomics, macroeconomics, calculus, linear algebra, real analysis, statistics, and computer science.
- Also worked one on one with biology research students who needed help conducting data analysis in R.

Publications

Anna C. Neufeld, Lucy L. Gao, Joshua Popp, Alexis Battle, and Daniela Witten (2022) Inference after latent variable estimation for single cell RNA-sequencing data. To appear in *Biostatistics. Winner of best student paper award at WNAR, 2022.*

Anna C. Neufeld, Lucy L. Gao, and Daniela M. Witten (2022) Tree-Values: selective inference for regression trees. *Journal of Machine Learning Research.*

Neufeld, A. and Witten, D. (2021). Discussion of Breiman's "Two Cultures": From Two Cultures to One. *Observational Studies.*

Maxian, O*., **Neufeld, A.***, Talis, E. J.*, Childs, L. M., & Blackwood, J. C. (2017). Zika virus dynamics: When does sexual transmission matter?. Epidemics, 21, 48-55. (* *denotes equal contribution*)

Software

countsplit: splitting integer-valued count matrices. R package available on github, with tutorials available on our website

treevalues: selective inference for regression trees. R package available on github, with tutorials available on our website

splinetree: longitudinal trees and forests using a spline projection method R package. Available from github and CRAN. Tutorials available on our website

Invited Presentations

- Electronic Undergraduate Statistics Research Conference, November 2022, Virtual. Panelist for graduate school information panel.
- Williams College Statistics Colloquium, October 2022, Virtual. *Avoiding "double dipping" in the analysis of single cell RNA-sequencing data.*
- Joint Statistical Meetings, August 2022. Panelist for: *Leo Breiman's Two Cultures: Introspection, Debate, and Discussion 20 Years Later.*
- International Seminar on Selective Inference, June 2022, Virtual. *Inference after latent variable estimation for single cell RNA-sequencing data.* [recording], [slides].

Contributed Presentations

- WNAR 2022, student paper competition session (June 20202 virtual). *Inference after latent variable estimation for single cell RNA-sequencing data.* Winner of best student paper award.

Professional Experience

Cogo Labs, Cambridge, MA June 2017-August 2017
Data Analytics Intern

- Worked with a team of engineers, designers, and analysts to build and market a website. Analyzed market data with SQL, analyzed site performance with google analytics and piwik, and assisted with backend web development in python.

Honors and Awards

University of Washington

2022	Z.W. Birnbaum Award	*Department of Statistics*
2020	Dorothy M. Gilford Excellence in Teaching Award	*Department of Statistics*

Williams College

2018	W. Marriott Canby Athletic Scholarship Prize (for highest standing in scholarship among senior varsity athletes)
2018	Robert M. Kozelka Prize in Statistics
2018	Sigma Xi Scientific Honor Society
2017	Phi Beta Kappa National Honor Society
2016-2018	New England Small Colleges Athletic Conference (NESCAC) All-Academic team
2016-2018	Clare Boothe Luce Fellowship
2016	Erastus C. Benedict First Prize in Mathematics (presented to outstanding sophomore)

Mentoring

University of Washington Undergrad Directed Reading Program (DRP)

- Co-founded a program that pairs undergraduates with PhD student mentors for independent studies. Modeled after successful Directed Reading Programs (DRPs) in mathematics departments at several universities. More information can be found at our website.
- Served as a graduate student coordinator from 2020-2022. Managed admissions, recruitment, and scheduling for over 60 undergraduate independent studies.

- Served as a mentor for the following undergraduate projects:
  - Winter 2020, Christina Nick, Statistical Natural Language Processing
  - Spring 2020, Rachael Ren, Infectious Disease Modeling with Differential Equations. See project writeup and presentation.
  - Autumn 2020, Harper Zhu, Infectious Disease Modeling on a Network. See presentation and shiny app.
  - Spring 2021, Kayla Kenyon, Infectious Disease Modeling.
  - Autumn 2021, Cathy Qi, Multiple Testing.
  - Winter 2022, Hisham Bhatti, Statistical Concepts in Clinical Trials.
  - Spring 2022, Wei Jun Tan and Iris Zhao, Introduction to Computational Biology, co-mentored with Alan Min.

Service

- Reviewer for *Statistical Science*.
- Lead consultant and volunteer recruitment coordinator for UW StatCom (statistics in the community), 2022-2023.
- Member of UW Statistics Undergraduate Curriculum Committee, 2021-2022.
- UW Statistics Graduate Student Representative (paid position that involves attending faculty meetings, serving on committees, and planning orientation for new students). 2020-2021.
- First round reviewer for PhD Admissions, 2020-2022.
- UW Statistics Diversity, Inclusion, Community, and Equity (DICE) Committee, 2019-2022.
- Chair of the UW Statistics Fun Committee, 2019-2020.
- Organizer and Founder: Statistics Education Reading Group, 2019-2020.

Outreach

- Lesson leader at UW GEAR UP's (Gaining Early Awareness and Readiness of Undergraduate Education) after school program (May 2021) and statistics summer camp (July 2022).

Other Activities

- Competed for the varsity swim and dive team at Williams College from 2014-2018.
- Trip leader (2015), leader trainer (2016), and director of transportation and logistics (2017) for the Williams Outdoor Orientation for Living as First-years (WOOLF).
- Williams College Great Ideas Committee (managed a budget of $10,000 per year to implement improvements to undergraduate life), 2015-2017.
- Williams College Committee on Undergraduate Life (committee consisted of students, faculty, and staff), 2015-2016.