Sheridan Grant | Curriculum Vitae

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I develop statistical solutions to challenging social science problems. Currently, I work on causal discovery and inference methods for assessing fairness in peer review. In the past I've worked in computational algebraic geometry, image processing, high-dimensional hypothesis testing, and genomics.

Current Research

My dissertation, co-advised by Elena Erosheva and Marina Meilă, is on fairness in peer review. We develop multivariate causal discovery methods for parts of peer review in which intervention is impossible, and analyze causal fairness in NIH and AIBS grant review data. Projects currently in progress are:

- **Bayesian Causal Model Selection:** A Bayesian take on causal discovery.
- **Causality in Peer Review:** We mold existing causal discovery and inference methods to meet the specific challenges of peer-review data.

Details for each project are available in person or upon the release of a preprint.

Education

- **University of Washington** **September 2016–June 2021 (expected)**
  PhD Candidate, Statistics
- **Pomona College** **August 2011–May 2015**
  B.A., Mathematics (minor, computer science)
  Advisor: Mark Huber (Claremont McKenna College). Thesis: "Recycling Randomness: Perfect Sampling on Graphical Distributions with Applications to Image De-Noising."
- **University of Cape Town** **January–June 2014**
  Study Abroad

Academic & Research Employment

- **Zestimate AI Intern** **Summer 2020**
  Zillow
  Conceptualized and assessed algorithmic fairness in Zillow's machine learning models. Details are NDA-restricted.
- **Instructor** **Summer 2019, Spring 2020**
  University of Washington
  - MATH/STAT 394: Probability I. Wrote lesson plans, homeworks and tests, and managed one TA (June-July 2019).
  - STAT 302: Statistical Computing. Wrote lesson plans, code, homeworks and tests, and managed on grader. Taught innovatively and interactively over Zoom during the first wave of the COVID-19 epidemic.
- **Research Intern** **Summer 2018**
  Microsoft Research Genomics
  - Developed software for integrating secondary gene analysis from Microsoft MSGen (BWA and GATK) and clinical data, using relational databases and parallel computation on Azure virtual machines.
  - Built ML model optimization and selection framework that predicts propensity for Sudden Infant Death Syndrome (SIDS) from genomic and clinical data; these models find genetic variants that may be responsible for SIDS.
- **Research Assistant** **January 2017–**
  University of Washington
  - Racial Bias in NIH Grant Reviews, with Elena Erosheva (January 2017–March 2018; NIH funded).
  - Peer Review Refinement, with Marina Meilă (March–June 2018; NSA funded).
  - Fair Peer Review, with Elena Erosheva and Marina Meilă (June 2018–March 2019, August 2019–; NSF funded).

- **Teaching Assistant** **September 2016–**
  University of Washington
  - STAT 220: Principles of Statistical Reasoning (with Ranjini Grove, fall 2016).
  - CSSS 564: Bayesian Statistics for the Social Sciences (with Jeff Arnold, spring 2017).
  - MATH/STAT 395: Probability II (with Michael Perlman, spring 2018).

- **Consultant** **June 2015–July 2016**
  Energy and Environmental Economics
  Helped modernize the firm's approach to modeling and analysis with computational and statistical methods such as mixed integer/linear programming and Monte Carlo simulation. Developed methods and software for valuing utility participation in real-time energy markets, economically modeled energy transmission between Arizona and northern Mexico, and researched the impact of climate change on the U.S. electricity grid.

- **Mentor and Grader** **September 2012–May 2015**
  Pomona College
  - MATH 103: Combinatorics (with Shahriar Shahriari and Vin de Silva; spring 2015, fall 2014, fall 2013).
  - MATH 107: Vector Calculus (with Vin de Silva and Dashiell Fryer; spring 2013, fall 2012).

- **Undergraduate Researcher** **Summer 2013**
  Texas A&M University
  Computational algebraic geometry research at a NSF-funded REU (Research Experience for Undergraduates), culminating in a publication and an award-winning presentation.

Peer-Reviewed Publications

- **Sheridan Grant, Marina Meilă, Elena Erosheva, and Carole Lee:** manuscript on information theoretic analysis of peer review data, submitted at the British Journal of Mathematical and Statistical Psychology.
- **Carole Lee, Sheridan Grant, and Elena Erosheva:** "Alternative grant models might perpetuate Black–White funding gaps." The Lancet, 2020.
- **Elena Erosheva, Sheridan Grant, Mei-Ching Chen, Mark Lindner, Richard Nakamura, and Carole Lee:** "Criterion Scores Completely Account for Racial Disparities in NIH Grant Review." Science Advances, 2020.
- **Sheridan Grant, Michael Perlman, and Darren Grant:** "Targeted testing for bias in order assignment, with an application to Texas election ballots." Journal of Statistical Planning and Inference, 2020.
- **Eleanor Anthony, Sheridan Grant, Peter Gritzmann, and J. Maurice Rojas:** "Polynomial-Time Amoeba Neighborhood Membership and Faster Localized Solving." In "Topological and Statistical Methods for Complex Data" 1st ed. Springer-Verlag Berlin Heidelberg, 2015.

Technical Reports

- **Snuller Price, Zachary Ming, Alison Ong, and Sheridan Grant (E3):** "Nevada Net Energy Metering Evaluation 2016 Update." 2016.
- **Jack Moore, Sheridan Grant, Sharad Bharadwaj, and Brian Conlon (E3):** "Idaho Power Company Energy Imbalance Market Analysis." 2016.
- **Jack Moore, Brian Conlon, Sheridan Grant, and Ren Orans (E3):** "PGE EIM Comparative Study: Economic Analysis Report." 2015.

Abstracts and Talks

- **Impact of Fresh Frozen Plasma Transfusion on Upper Gastrointestinal Bleeding in Patients with Cirrhosis:** Baxi, A.C., **Grant, S.**, Teng, B.J., Harms, M.A., Jensen-Otsu, E., Strate, L.L. and Ko, C.W. Abstract/Poster. The American Journal of Gastroenterology, 2017.
- **Presenting Information Effectively in the Classroom:** Lecturer at the UW TA Conference. University of Washington, summer 2017.
- **Approximating Amoebae Using Archimedean Tropical Varieties:** MAA Mathfest Undergraduate Paper Sessions, summer 2013.

Software

- **targetedordertest**: R package implementing the statistical methods from Grant, Perlman, and Grant, 2020.
- My website's source code, in Bootstrap HTML.

Skills and Languages

- **Programming:** Proficient in Python, R. Familiar with C++, Java, Bash, SQL, Matlab, Mathematica, Haskell, Prolog, Racket, VBA.
- **Software:** Git, Excel, Tensorflow, Linux (Ubuntu), GATK, AWS, Microsoft Genomics Services, Azure, Azure Machine Learning Studio, SQL Server Management Studio, Android Studio, ArcGIS.
- **Entrepreneurship:** Head ML engineer for the 3rd place team at Madrona Venture Labs's GoVertical ML Startup competition 2019.
- **Languages:** English, conversational Spanish.

Awards

- **Magna cum Laude:** Pomona College, 2015.
- **Distinction in the Senior Mathematics Thesis:** Pomona College, 2015.
- **Levy Memorial Prize in Mathematics:** Awarded to 3 junior math majors. Pomona College, 2014.
- **Phi Beta Kappa:** Inducted as a junior. Pomona College, 2014.
- **Undergraduate Student Presentation Award:** Best talk in a session of 6. MAA Mathfest, 2013.
- **Tileston General Physics Prize:** Awarded to 4 freshman physicists. Pomona College, 2012.

Service

- **Directed Reading Program Mentor** **Spring 2020**
  US Statistics Department
  Guided an undergraduate student through an introduction to Causal Inference and its applications.
- **Diversity & Inclusion Committee** **September 2019–**
  US Statistics Department
  Designed admitted students survey; coordinated and participated in undergraduate recruitment efforts, especially for underrepresented students.
- **Data Science Mentor** **April 2019**
  UW DataFest
  Mentored teams of undergraduates in data science and statistical modeling at the ASA-sponsored UW DataFest.
- **Discrete Math Mentor** **Autumn 2018**
  UW Math Department
  Mentored UW Discrete Math (MATH 381) students in scheduling problems in a mock consulting environment.
- **Statistics in the Community** **September 2018–**
  UW Statistics Department
  Helped the Vashon Nature Center assess the effect of bulkhead removal on coastline ecology.
- **Lead TA** **September 2017–August 2019**
  UW Statistics Department
  Manage the Statistics Tutor and Study Center, train incoming TAs, resolve professor-TA conflicts.
- **Facilitator** **September 2017**
  UW TA Conference
  Taught a short course on presenting information effectively in the classroom.
- **Teacher** **Summer 2017**
  STEMPREP Academy
  Taught statistics to 7th- and 8th-grade students. Basics of probability, R programming, experimental design.

- **Math Department Liaison** **September 2014–May 2015**
  Pomona College
  Organized department events and served as a point of contact for underclassmen interested in majoring in math.

References/Recommendations

- **Elena Erosheva:** erosheva@uw.edu. Dissertation co-adviser. University of Washington Statistics, Social Work, and Center for Statistics in the Social Sciences.
- **Marina Meilă:** mmp2@uw.edu. Dissertation co-adviser. University of Washington Statistics.
- **Thomas Richardson:** thomasr@uw.edu. Dissertation committee member. University of Washington Statistics, Amazon.
- **Carole Lee:** c3@uw.edu. Dissertation committee member. University of Washington Philosophy.

Interests

I ran Division III Cross Country and Track at Pomona College, and now I compete for Seattle's Club Northwest in track, cross country, road, and trail racing (I'm also on the board). I play for the UW Statistics Department's intramural soccer and ultimate frisbee teams, and for the UW Table Tennis Club. I've played piano since I was 8. I go backpacking whenever I get the chance. I've done sections of the PCT, 150 miles in the Grand Canyon, the Salkantay Trail in Peru, 100 miles on the Jordan National Trail, and numerous shorter trips around Washington state.