Robin Dunn

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Education

Carnegie Mellon University — Pittsburgh, PA

PhD in Statistics — *Aug 2016 – July 2021*

Thesis topic: *Advances in Nonasymptotic and Nonparametric Inference*.
Co-advisors: Larry Wasserman, Aaditya Ramdas.

Master of Science in Statistics — *Aug 2016 – May 2017*

Kenyon College — Gambier, OH

Bachelor of Arts in Mathematics, Scientific Computing Concentration — *Aug 2012 – May 2016*

Valedictorian, Highest Honors in Mathematics, Distinction on Mathematics Senior Exercise.
Phi Beta Kappa. GPA: 4.0.

Experience

Novartis Pharmaceuticals Corporation — East Hanover, NJ

Senior Principal Statistical Consultant — *May 2023 – present*
Principal Statistical Consultant — *Sept 2021 – May 2023*

Implement state-of-the-art statistical methods, models, and machine learning at the trial and project level. Advanced Exploratory Analytics group of the Advanced Methodology & Data Science team.

Biostatistics PhD Intern — *May 2017 – Aug 2017*

Analyzed data from the Osteoarthritis Initiative's ten-year longitudinal database. Constructed predictive models for knee replacements, explored missing data methods, and applied joint models for longitudinal and time-to-event data. Presented on several international conference calls.

Carnegie Mellon University Department of Statistics & Data Science — Pittsburgh, PA

Research Assistant — *Aug 2016 – July 2021*

Research Collaborator for CMU / Novartis Partnership — *Feb 2020 – Sep 2020*

Collaborated on analysis of a personalized medicine cancer treatment, through a partnership between Novartis Pharmaceuticals and Carnegie Mellon's Department of Statistics & Data Science. Developed multistate models for patient progression from pre-treatment through follow-up. Consulted with physicians, statisticians, and biometricians. Presented on twice weekly international conference calls.

Instructor for 36-315: Statistical Graphics and Visualization — *May 2019 – June 2019*

Developed course materials, presented lectures, led labs, and held office hours.
Topics: choosing and interpreting graphics, mastering `ggplot`, interactive graphics with `shiny`.

Head Teaching Assistant — *Aug 2018 – Dec 2019*

Held office hours, led lab sections, graded assignments, coordinated course logistics, filled in for lecture.
Courses: Statistical Graphics and Visualization (36-315), Advanced Methods for Data Analysis (36-402/608), Data Mining (36-462/662).

Research Mentor for Summer Undergraduate Research Experience in Statistics — *May 2018 – July 2018*

Student advisees: Alexander Asemota, Sophia Hecht, Daniel Rodriguez
Faculty supervisors: Anjali Mazumder, Chad Schafer
Mentored students to identify research directions on data science for justice. Provided guidance on `R` tools (`ggplot`, `data.table`, shapefiles) and statistical models (generalized linear models, random forests, spatiotemporal ETAS models). Students presented their final work at a departmental seminar and at the poster session of the American Statistical Association's 2018 StatFest.

Kenyon College Office of Institutional Research — Gambier, OH

Institutional Research Student Consultant — *Aug 2013 – June 2016*

Analyzed survey data in `R`, wrote reports on statistical findings, hosted focus groups, and interpreted data to support professors applying for grants. Created a Tableau data visualization of majors and careers of Kenyon graduates.

Publications

[1] Robin Dunn, Aditya Gangrade, Larry Wasserman, and Aaditya Ramdas. Universal Inference Meets Random Projections: A Scalable Test for Log-Concavity. *Journal of Computational and Graphical Statistics*, 2024. URL https://doi.org/10.1080/10618600.2024.2347338. R package: LogConcaveUniv. Accepted preprint.

[2] Robin Dunn, Larry Wasserman, and Aaditya Ramdas. Distribution-Free Prediction Sets for Two-Layer Hierarchical Models. *Journal of the American Statistical Association*, 118(544):2491–2502, 2023. URL https://doi.org/10.1080/01621459.2022.2060112. R package: ConformalTwoLayer.

[3] Robin Dunn, Aaditya Ramdas, Sivaraman Balakrishnan, and Larry Wasserman. Gaussian Universal Likelihood Ratio Testing. *Biometrika*, 110(2):319–337, 2023. URL https://doi.org/10.1093/biomet/asac064. R code: GaussianUniv_sims.

[4] Robin Dunn, Joel Greenhouse, David James, David Ohlssen, and Peter Mesenbrink. Risk Scoring for Time to End-Stage Knee Osteoarthritis: Data from the Osteoarthritis Initiative. *Osteoarthritis and Cartilage*, 28(8):1020–1029, 2020. URL https://doi.org/10.1016/j.joca.2019.12.013.

[5] Niccolò Dalmasso*, Robin Dunn*, Benjamin LeRoy*, and Chad Schafer. A Flexible Pipeline for Prediction of Tropical Cyclone Paths. *ICML Workshop on Climate Change: How can AI help?*, 2019. URL https://www.climatechange.ai/papers/icml2019/14.
*Equal contributions. R package: TCpredictionbands.

Short Courses

Causal Inference in Randomized Controlled Trials

Joint Statistical Meetings — [1]*Aug 2023,* [2]*Aug 2024,* [3]*Aug 2025 (upcoming)*

International Biometric Conference — [4]*Dec 2024*

International Society for Biopharmaceutical Statistics — [5]*Mar 2024*

ICSA Applied Statistics Symposium — [6]*June 2023*

Overview of causal inference, relevant regulatory guidances, common estimation methods, hypothetical and principal stratum strategies for intercurrent events, and conditional and marginal estimands. Presented with Mouna Akacha[1], Björn Bornkamp[2], Frank Bretz[4], Shanti Gomatam[123], Jiarui Lu[456], Tianmeng Lyu[136], Bohdana Ratitch[2], Kaspar Rufibach[1], and Dong Xi[356].
Code: Causal-inference-in-RCTs.

Selected Presentations

1. "Covariate adjustment in randomized trials: discussion," Society for Clinical Trials. Boston, MA. May 2024. Discussant for invited session on Covariate adjustment in randomized trials.

2. "Learnings from a pharmaceutical covariate adjustment challenge," International Symposium on Biopharmaceutical Statistics. Baltimore, MD. March 2024. Invited session on Covariate adjustment in randomized clinical trials.

3. "Universal inference meets random projections: a scalable test for log-concavity," Joint Statistical Meetings. Toronto, Ontario, Canada. August 2023. Contributed paper session on Geometric methods to nonparametric inference.

4. "Hypothesis testing with universal inference," Kenyon College Math Department. Gambier, OH. April 2023. Invited seminar for Pi Mu Epsilon math honor society induction ceremony.

5. "A risk score for end-stage knee osteoarthritis," Carnegie Mellon University course on Applied Survival Analysis. Virtual. February 2022. Invited guest presentation.

6. "Distribution-free prediction sets," Kenyon College Math Department. Virtual. April 2021. Invited departmental seminar.

Honors and Awards

PhD Teaching Assistant of the Year *May 2019*

Carnegie Mellon University Department of Statistics & Data Science

Awarded for head TA performance in 36-402/608: Advanced Methods for Data Analysis (Spring 2019).

Gertrude M. Cox Scholarship *Apr 2016*

ASA Committee on Women in Statistics and Caucus for Women in Statistics

Awarded yearly to one woman in or entering the early stages of graduate statistical training (MS or PhD) and to one woman in a more advanced stage of training.

Reginald B. Allen Prize *Apr 2016*

Kenyon College Department of Mathematics & Statistics

Awarded each year to a student whom the professors of the Department of Mathematics decide has done the most outstanding work in mathematics.

NSF Graduate Research Fellowship *Mar 2016*

National Science Foundation

Recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees.

Goldwater Scholar *Mar 2015*

Barry Goldwater Scholarship and Excellence in Education Foundation

National award for undergraduate students interested in pursuing scientific research careers.

CAUSE Undergraduate Statistics Class Project Competition, third place *Jul 2013*

Consortium for the Advancement of Undergraduate Statistics Education

Won third place in a national competition for a project titled "Studies on Water Components" that used bootstrapping statistical methodology to analyze water sampling data.

Service

Peer reviewer *2019 – present*

Journal of the American Statistical Association (2024), *Journal of Survey Statistics and Methodology* (2023), *Pharmaceutical Statistics* (2023), ECML PKDD PharML workshop (2022, 2023), Climate change workshops (ICLR 2023; ICML 2021; NeurIPS 2019, 2020, 2021, 2022), *Journal of Machine Learning Research* (2019)

PhD student mentor *2018, 2020*