

KEVIN DONOVAN

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EDUCATION

University of North Carolina at Chapel Hill

August 2015 - Present

PhD in Biostatistics

Department of Biostatistics

Gillings School of Global Public Health

Syracuse University

January 2013 - May 2015

B.S. in Mathematics

GPA: 3.962

B.S. with Distinction in Economics

OBJECTIVE

Leading statistical analyses and teaching statistics in a collaborative setting, along with the development of methods for analyzing spatio-temporal data. I am interested in analyzing associations between spatial locations and how these may change across time for geographical and brain imaging data.

RESEARCH INTERESTS

Spatial Data Analysis

Time Series Analysis

Neural Imaging Data Analysis

Network Analysis

Statistical Signal Processing

Causal Inference

Machine Learning

EXPERIENCE

Instructor

January 2021 - May 2021

BIOS 635: Introduction to Machine Learning

- Instructor for graduate-level course serving as introduction to machine learning methods, including statistical theory and computational application with real data. Students are cross-discipline, including statistics, computer science, and public health.
- Developed course notes, assignments, and examinations/projects based on material from previous iteration of course.
- Classes held virtually, including virtual office hours, under advisement from department faculty member

Research Assistant

March 2018 - Present

Carolina Institute for Developmental Disabilities

- Development of algorithms for early prediction of Autism Spectrum Disorder (ASD) using behavioral data and imaging data, with random forests, support vector machines, and deep learning methods using R and Python. Random forest algorithm using behavioral data published.
- Analysis focused on examining causes of ASD prevalence and symptom heterogeneity by infant sex, using latent variable models such as factor analysis and growth mixture models.

- Development of a set of tutorials detailing the use of R software for data management and data analysis. Course based on these tutorials created with bi-weekly virtual sessions held and corresponding office hours.
- Direct collaboration with scientists writing statistical analysis and results sections in published manuscripts. Further duties included data management using R, writing code in R for all corresponding statistical analysis, and creation of figures and tables using R. Methods used include generalized linear models, mixed models with longitudinal data, mediation models, and non-supervised clustering algorithms.

Teaching Assistant

August 2017 - December 2017

BIOS 600: Principles of Statistical Inference

- Teaching assistant for introductory statistics class for non-Biostatistics public health graduate students
- Organized and ran lab sessions with 50+ students. Sessions consisted of practice applying statistical principals to real and simulated data using R computing software.
- Graded lab reports, held office hours and review sessions for mid term and final examinations

Research Assistant

September 2016 - May 2019

Collaborative Studies Coordinating Center (CSCC)

- Under direction of mentor, lead statistical analyses for published research on HIV-positive youth, directly collaborating with investigators across the United States. Responsibilities included data management using SAS and R, writing code in R for all statistical analyses, creation of figures and tables using R, and communicating the results and methods to investigators.
- Development of R package **lodr** containing software to conduct regression analyses when some predictors have a known limit of detection, requiring the use of Rcpp and C++ code. Package made publicly available on CRAN.

Research Assistant

August 2015 - March 2018

Dr. Michael G. Hudgens

- Developed and published research on methodology for estimating biomarker levels which correspond to a desired upper bound on the risk of disease, with corresponding R code for implementing the methods published on Github.

COURSEWORK

Advanced Probability and Statistical Inference
 Linear and Generalized Linear Models
 Longitudinal Data Analysis
 Statistical Methods in Diagnostic Medicine
 Machine Learning
 Survival Analysis
 Spatial Statistics

COMPUTING EXPERIENCE

R, SAS, C++ and Rcpp, Matlab, Linux cluster computing

DEVELOPED SOFTWARE

1. **Donovan, K.**, Psioda, M., Hudgens, M. & Loop, M. R Package. **lodr**: Regression with biomarkers subject to limit of detection. 2020. <https://cran.r-project.org/web/packages/lodr/index.html>.

PUBLICATIONS

Published

1. **Donovan, K.**, Hudgens, M. & Gilbert, P. Nonparametric inference for immune response thresholds of risk in vaccine studies. *The Annals of Applied Statistics* **13**, 1147–1165. <https://www.ncbi.nlm.nih.gov/pubmed/31285781> (2019).
2. Du Pisanie, J., Abumoussa, A., **Donovan, K.**, Stewart, J., Bagla, S. & Isaacson, A. Predictors of Prostatic Artery Embolization Technical Outcomes: Patient and Procedural Factors. *Journal of Vascular and Interventional Radiology* **30**, 233–240. <https://www.ncbi.nlm.nih.gov/pubmed/30717955> (2019).
3. Kim-Chang, J. J., **Donovan, K.**, Loop, M. S., Hong, S., Fischer, B., Venturi, G., Garvie, P. A., Kohn, J., Rendina, H. J., Woods, S. P., *et al.* Higher soluble CD14 levels are associated with lower visuospatial memory performance in youth with HIV. *AIDS* **33**, 2363–2374. <https://www.ncbi.nlm.nih.gov/pubmed/31764101> (2019).
4. Swanson, M. R., **Donovan, K.**, Paterson, S., Wolff, J. J., Parish-Morris, J., Meera, S. S., Watson, L. R., Estes, A. M., Marrus, N., Elison, J. T., *et al.* Early language exposure supports later language skills in infants with and without autism. *Autism Research* **12**, 1784–1795. <https://www.ncbi.nlm.nih.gov/pubmed/31254329> (2019).
5. Grzadzinski, R., **Donovan, K.**, Truong, K., Nowell, S., Lee, H., Sideris, J., Turner-Brown, L., Baranek, G. T. & Watson, L. R. Sensory Reactivity at 1 and 2 Years Old is Associated with ASD Severity During the Preschool Years. *Journal of Autism and Developmental Disorders*, 1–10. <https://www.ncbi.nlm.nih.gov/pubmed/32157566> (2020).
6. Meera, S. S., **Donovan, K.**, Wolf, J., Zwaigenbaum, L., Elison, J., Truong, K. & Pivon, J. Towards a Data Driven Approach to Screen for Autism Risk at 12 Months of Age. *Journal of the American Academy of Child and Adolescent Psychiatry*. [https://www.jaacap.org/article/S0890-8567\(20\)32060-8/fulltext](https://www.jaacap.org/article/S0890-8567(20)32060-8/fulltext) (2020).

Submitted

7. **Donovan, K.**, Psioda, M., Hudgens, M. & Loop, M. lodr: An R package for regression with biomarkers subject to limit of detection. Submitted to *R Journal*. <https://cran.r-project.org/web/packages/lodr/index.html> (2020).

PROFESSIONAL PRESENTATIONS

1. Statistical Methods for Adolescent HIV Trials. Contributed Session. Joint Statistical Meeting 2020. Philadelphia, PA. (2020).

REFERENCES

Available upon request