

# KEVIN DONOVAN

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## EDUCATION

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### 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  
B.S. with Distinction in Economics

GPA: 3.962

## OBJECTIVE

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Leading statistical analyses and teaching statistics in a collaborative setting, along with the development of methods for analyzing high-dimensional spatio-temporal data, based on concepts from signal processing. I am most interested in analyzing associations between spatial locations and how these may change across time for geographical and neural imaging data.

## RESEARCH INTERESTS

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Spatio-temporal Data Analysis  
Signal Processing  
Causal Inference  
Statistical Learning

## EXPERIENCE

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### 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 unsupervised 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

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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

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

## DEVELOPED SOFTWARE

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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

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## 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

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

## REFERENCES

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Available upon request