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 high-dimensional spatio-temporal data, based on concepts from signal processing. I am most interested in analyzing associations between spatial locations (*networks*) and how these may change across time for medical imaging and geographical data.

RESEARCH INTERESTS

Imaging Data Analysis
Signal Processing
Statistical Learning
Causal Inference

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 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

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++, Rcpp, Matlab, Python, 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 (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 SERVICE

Reviewer for

- Biometrics

PROFESSIONAL PRESENTATIONS

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

REFERENCES

Available upon request