

## Joseph Lawrence Antonelli, Ph.D.

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CONTACT INFORMATION	University of Florida Department of Statistics 206 Griffin-Floyd Hall, P.O. Box 118545 Gainesville, FL 32611-8545	Office phone: +1 352-273-4638 jantonelli@ufl.edu
CURRENT POSITION	Assistant Professor, Department of Statistics University of Florida, Gainesville, FL	2018 - present
EDUCATION	Ph.D. Biostatistics, Harvard University <i>Thesis:</i> Statistical methods for analyzing complex spatial and missing data <i>Advisors:</i> Professors Francesca Dominici and Brent Coull	2015
	M.A. Biostatistics, Harvard University	2013
	B.S. Statistics, The University of Florida <i>Summa Cum Laude</i>	2011
RESEARCH AND PROFESSIONAL EXPERIENCE	Postdoctoral Research Fellow, Department of Biostatistics Harvard T.H. Chan School of Public Health, Boston, MA	2015 - 2018
	Statistical Consultant, Brigham and Women's Hospital Boston, MA	2015 - 2018
	Decision Support Analyst Intern, Google Inc. Mountain View, CA	2013
	Environmental Statistics Trainee, National Institutes of Health Boston, MA	2011 - 2015
	Statistical Programming Intern, Department of Pharmaceutical Outcomes and Policy Gainesville, FL	2010 - 2011
	Actuarial Intern, Tower Hill Insurance Company Gainesville, FL	2009
TEACHING EXPERIENCE	Professor, University of Florida Department of Statistics <i>Course:</i> Advanced topics in causal inference	2022
	Professor, University of Florida Department of Statistics <i>Course:</i> Statistical learning in R	2020-2022
	Professor, University of Florida Department of Statistics <i>Course:</i> Categorical data analysis	2020-2021
	Professor, University of Florida Department of Statistics <i>Course:</i> Introduction to Statistical Inference	2019
	Professor, University of Florida Department of Statistics <i>Course:</i> Introduction to Probability	2018-2019

Course Developer, Harvard Department of Biostatistics <i>Course:</i> Applied Bayesian Methodology	2016
Teaching Assistant, Harvard Department of Biostatistics <i>Course:</i> Advanced Topics in Clinical Trials	2014
Teaching Assistant, Harvard Department of Biostatistics <i>Course:</i> Bayesian Methodology in Biostatistics.	2013 - 2014
Teaching Assistant, Harvard Department of Biostatistics <i>Course:</i> Statistical Programming in R	2012
Teaching Assistant, Harvard Department of Biostatistics <i>Course:</i> Introduction to Python	2012

#### ADVISING EXPERIENCE

##### STATISTICS AND BIOSTATISTICS STUDENTS

Ruixuan Dong, Master's student	2022-present
Saurabh Bhandari, PhD student	2021-present
Tingting Wang, Master's student	2021
Zhongyue Zhang, Master's student	2021
Heejun Shin, PhD student	2020-present
Caleb Wong, Undergraduate student	2020-2022
Partha Sarkar, Master's student	2020-2021
Shiyu li, Master's student	2020-2021
Emmett Kendall, Undergraduate student (current PhD student at NC State)	2019-present
Gary Wu, Undergraduate student	2019
Srijata Samanta, Research assistant	2018 - 2021
Armando Turchetta, Master's student (Co-advisor)	2017

##### ADDITIONAL DISSERTATION COMMITTEE MEMBERSHIP

Maoran Xu, Ph.D, Statistics	2021-2022
Xueyin Bai, Ph.D, Urban and Regional Planning	2021-2022
Ayobami Edun, Ph.D, Electrical and Computer Engineering	2020-2022
Chuji Luo, Ph.D, Statistics	2019-2021
Rodrigo Rompazo Amadeu, Ph.D, Horticultural Sciences	2019-2021
Franjo Ivankovic, Ph.D, Genetics and Genomics	2018-2022

## HONORS AND AWARDS

2020 Health Effects Institute Walter A. Rosenblith young investigator award  
 2020 Journal of Speech, Language, and Hearing Research editors award for “Parental language input to children with hearing loss: does it matter in the end?”  
 2017 JSM Biometrics section young investigators award for “Doubly robust matching estimators for high dimensional confounding adjustment”  
 2016 International Society for Bayesian Analysis (ISBA) young investigator travel award  
 2015 Harvard Biostatistics award for excellence in teaching  
 2015 International Conference on Health Policy Statistics (ICHPS) student travel award  
 2014 ENAR distinguished student paper award for “Mitigating bias in generalized linear mixed models: The case for Bayesian nonparametrics”  
 Recipient of Harvard scholarship to attend a course on environmental genetics in Cyprus, 2012  
 Phi Beta Kappa, 2010

## GRANT FUNDING

Health Effects Institute 2021 – 2024  
 Robust statistical approaches to understanding the causal effect of air pollution mixtures.  
 Role: Principal Investigator.

National Institutes of Health, R01 DC015992 2018 – 2021  
 Spoken Language in Adolescents with Hearing Loss  
 Role: Key personnel (PI: Susan Nittrouer)

## PUBLICATIONS AND SUBMITTED MANUSCRIPTS

### STATISTICAL METHODOLOGY AND EPIDEMIOLOGY

Shin H, **Antonelli JL**. Improved Inference for Doubly Robust Estimators of Heterogeneous Treatment Effects. *arXiv: 2111.03594*. Under revision. *Biometrics*.

**Antonelli JL**, Wilson A, Coull B. Multiple exposure distributed lag models with variable selection. *arXiv: 2107.14567*. Under revision. *Biostatistics*.

Kendall E, Beck B, **Antonelli JL**. Robust inference for geographic regression discontinuity designs: assessing the impact of police precincts. *arXiv: 2106.16124*.

**Antonelli JL**, Beck B. Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy. *arXiv: 2006.07681*.

Linero A, **Antonelli JL**. The How and Why of Bayesian Nonparametric Causal Inference. *arXiv: 2111.03897*. To appear. *WIREs Computational Statistics*.

Samanta S, **Antonelli JL** Estimation and false discovery control for the analysis of environmental mixtures. *arXiv: 2103.10563*. *Biostatistics*.

**Antonelli JL**, Papadogeorgou G, Dominici F. Causal Inference in high dimensions: A marriage between Bayesian modeling and good frequentist properties. *Biometrics*. 2020.

Bai R\*, Moran G\*, **Antonelli JL\*** (Co-first author), Chen Y, Boland M. Spike-and-slab group lassos for grouped regression and sparse generalized additive models. *Journal of the American Statistical Association*. 2020.

**Antonelli JL**, Cefalu M. Averaging causal estimators in high dimensions. *Journal of Causal Inference*. 8.1 (2020): 92-107.

**Antonelli JL**, Mazumdar M, Bellinger D, Christiani D, Wright R, Coull B. Estimating the health effects of environmental mixtures using Bayesian semiparametric regression and sparsity inducing priors. *The Annals of Applied Statistics*. 14.1 (2020): 257-275.

**Antonelli JL** Daniels, M. Invited discussion of "Penalized spline of propensity methods for treatment comparison". *Journal of the American Statistical Association*. 2019.

**Antonelli JL**, Parmigiani G, Dominici F. High dimensional confounding adjustment using continuous spike and slab priors. *Bayesian Analysis*. 2018.

**Antonelli JL**, Cefalu M, Palmer N, Agniel D. Doubly robust matching estimators for high dimensional confounding adjustment. *Biometrics*. 2018.

**Antonelli JL**, Han B, Cefalu M. A synthetic estimator for the efficacy of clinical trials with all-or-nothing compliance. *Statistics in Medicine*. 36.29 (2017): 4604-4615.

Makar M\*, **Antonelli JL\*** (Co-first author), Di Q, Cutler D, Schwartz J, Dominici F. Estimating the causal effect of low levels of fine particulate matter on hospitalization. *Epidemiology*. 28.5 (2017): 627-634.

**Antonelli JL**, Zigler CM, Dominici F. Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research. *Biostatistics*. 2017

**Antonelli JL**, Schwartz J, Kloog I, Coull B. Spatial multiresolution analysis of the effect of PM<sub>2.5</sub> on birth weights. *The Annals of Applied Statistics* 2017; 11.2: 792-807.

**Antonelli JL**, Cefalu M, Bornn L. The positive effects of preferential sampling in environmental epidemiology. *Biostatistics* 2016; 17(4): 764-778.

**Antonelli JL**, Trippa L, Haneuse S. Mitigating bias in generalized linear mixed models: The case for Bayesian nonparametrics. *Statistical Science* 2016; 31.1: 80-95.

#### COLLABORATIVE PUBLICATIONS

Nitttrouer S, **Antonelli JL**, Lowenstein J. The Emergence of Bifurcated Structure in Children's Language. To appear. *Journal of Experimental Psychology*.

Henglin M, Claggett B, **Antonelli JL**, Alotaibi M, Magalang G, Watrous J, Lagerborg K, Ovsak G, Musso G, Demler O, Ramachandran V, Larson M, Jain M, Cheng S. Quantitative comparison of statistical methods for human disease trait association with mass spectrometry based metabolomics data. *Metabolites*. 2022.

Beck B, **Antonelli JL**. The Effects of New York City's Neighborhood Policing Program on Crime, Misdemeanor Arrests, and Racial Disparities. *Police Quarterly*. 2020.

Nitttrouer S, Lowenstein J, **Antonelli JL**. Parental language input to children with hearing loss: does it matter in the end?. *Journal of Speech, Language, and Hearing Research*. 63.1 (2020): 234-258.

**Antonelli JL\***, Claggett B\* (Co-first author), Henglin M, Watrous J, Demler O, Hushcha P, Demler O, Mora S, Pereira A, Jain M, Cheng S. Statistical Workflow for Feature Selection in Human Metabolomics Data. *Metabolites*. 2019.

Henglin M, Niiranen T, Watrous J, Lehmann K, **Antonelli JL**, Claggett B, Demosthenes E, Von Jeinsen B, Ramachandran V, Larson M, Jain M, Cheng S. A single visualization technique for displaying multiple metabolite-phenotype associations. *Metabolites*. 2019

#### BOOK CHAPTERS

**Antonelli JL**. Bayesian propensity score methods and related approaches for confounding adjustment. *Handbook of multivariate matching and weighting for causal inference*. Chapman and Hall (CRC Press). Editors E. Stuart, J. Zubizarreta, D. Small, P. Rosenbaum. To appear.

**Antonelli JL**, Dominici F. Bayesian Model Averaging in Causal Inference. *Handbook of Bayesian Variable Selection*. Chapman and Hall (CRC Press). Editors M. Tadesse and M. Vanucci. 2022.

INVITED  
PRESENTATIONS  
AND CONFERENCE  
PARTICIPATION

Invited conference speaker. “Improved Inference for Doubly Robust Estimators of Heterogeneous Treatment Effects.” International Society for Bayesian Analysis (ISBA). Montreal, Canada. 2022.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. University of Copenhagen. Copenhagen, Denmark. 2022.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. Università di Firenze. Florence, Italy. 2022.

Invited conference speaker. “Improved Inference for Doubly Robust Estimators of Heterogeneous Treatment Effects.” Eastern North American Regional (ENAR) Biometrics Conference. Houston, TX. 2022.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. Center for Causal Inference at the University of Pennsylvania and Rutgers University. 2022.

Special invited session speaker: “Improved Doubly Robust Inference for Treatment Effect Heterogeneity when using Nonparametric and High-dimensional Models”. CMStatistics. Virtual. 2021.

Session organizer: “Recent advancements in causal inference”. CMStatistics. Virtual. 2021.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. RAND Corporation. 2021.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. The University of Glasgow, Department of Economics. 2021.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. The Online Causal Inference Seminar. 2021.

Invited conference speaker: “Multiple exposure distributed lag models with variable selection”. International Society for Environmental Epidemiology. Virtual. 2021.

Short course instructor: “High-dimensional Bayesian modeling”. International Society for Bayesian Analysis (ISBA). Virtual. 2021.

Invited conference speaker: “Estimating heterogeneous causal effects in time series settings with staggered adoption”. International Society for Bayesian Analysis (ISBA). Virtual. 2021.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. The University of South Carolina, Department of Statistics. 2021.

Invited seminar speaker. “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. Columbia University Causal Inference Seminar, Department of Biostatistics. 2021.

Session organizer: “Leading a research group: Challenges faced, lessons learned, and advice for junior researchers”. Eastern North American Regional (ENAR) Biometrics Conference. Virtual. 2021.

Invited conference speaker: “Estimating heterogeneous causal effects in time series settings with staggered adoption”. CMStatistics. Virtual. 2020.

Session organizer: “Advanced topics in causal inference”. CMStatistics. Virtual. 2020.

Invited seminar speaker. “Estimating heterogeneous causal effects in time series settings with staggered adoption: An application to neighborhood policing”. Johns Hopkins University Causal Inference Seminar, Department of Biostatistics. 2020.

Invited seminar speaker. “Estimating the causal effects of neighborhood policing using multivariate time series”. Eastern North American Regional (ENAR) Biometrics Conference. Nashville, TN. 2020.

Invited seminar speaker. “Doubly robust approaches to causal inference in high dimensions”. Yale University. Department of Biostatistics. 2020.

Session organizer: “Methodological advances in causal inference”. CMStatistics. London. 2019.

Invited seminar speaker. “Doubly robust approaches to causal inference in high dimensions”. University of Texas at Austin. Department of Statistics and Data Science. 2019.

Invited seminar speaker. “Estimating the health effects of environmental mixtures using Bayesian semiparametric regression and sparsity inducing priors”. Florida State University Department of Statistics. 2019.

Invited conference speaker: “A Bayesian semiparametric framework for causal inference in high-dimensional data.” Atlantic Causal Inference Conference (ACIC). Montreal, Canada. 2019.

Invited seminar speaker. “Estimating the health effects of environmental mixtures using Bayesian semiparametric regression and sparsity inducing priors”. University of Tampa Department of Mathematics. 2019.

Invited conference speaker: “A Bayesian semiparametric framework for causal inference in high-dimensional data.” Eastern North American Regional (ENAR) Biometrics Conference. Philadelphia, PA. 2019.

Invited seminar speaker. “Estimating the health effects of environmental mixtures using Bayesian semiparametric regression and sparsity inducing priors”. University of Athens Department of Mathematics. 2018.

Invited seminar speaker. “Estimating the health effects of environmental mixtures using Bayesian semiparametric regression and sparsity inducing priors”. University of Florida Department of Biostatistics. 2018.

Invited seminar speaker: “Bayesian variable selection for multi-dimensional semiparametric regression models.” Boston Bayesians. 2018.

Invited conference speaker: “A Bayesian semiparametric framework for causal inference in high-dimensional data.” International Indian Statistical Association Conference. Florida. 2018.

Invited seminar speaker: “Bayesian variable selection for multi-dimensional semiparametric regression models.” Yale University. 2017.

Invited seminar speaker: “Bayesian variable selection for multi-dimensional semiparametric regression models.” McGill University. 2017.

Invited seminar speaker: “Bayesian variable selection for multi-dimensional semiparametric regression models.” University of Florida. 2017.

Invited seminar speaker: “Bayesian variable selection for multi-dimensional semiparametric regression models.” New York University. 2017.

Invited conference speaker: “High dimensional confounding adjustment using continuous spike and slab priors”. CMStatistics. London. 2017.

Topic contributed talk: “Doubly robust matching estimators for high dimensional confounding adjustment.” Joint Statistical Meetings. Baltimore, MD. 2017.

Webinar: “Estimating the causal effect of low levels of fine particulate matter on hospitalization”. EPA STAR Webinar. 2017.

Invited seminar speaker: “Spatial multiresolution analysis of irregularly spaced grids with application to the effect of PM<sub>2.5</sub> on birth weights”. Georgetown University. 2017.

Invited lecture: “Using wavelets to decompose air pollution surfaces”. Georgetown University. 2017.  
Webinar: “Estimating the causal effect of lowering particulate matter levels below the United States standards on hospitalization and death: An observational study using an open cohort”. Health Effects Institute Webinar Series. 2016.

Invited seminar speaker: “A synthetic estimator for the efficacy of clinical trials with all-or-nothing compliance” RAND corporation. Los Angeles, CA, 2016.

Invited seminar speaker: “Spatial multiresolution analysis of irregularly spaced grids with application to the effect of PM<sub>2.5</sub> on birth weights.” Harvard University Department of Biostatistics Environmental Health Seminar, 2014.

#### CONTRIBUTED PRESENTATIONS

Contributed talk: “Heterogeneous causal effects of neighborhood policing in New York City with staggered adoption of the policy”. HBS/IMS New Researchers Conference. Boston, MA. 2021

Contributed poster: “Bayesian Distributed Lag Interaction Models Using Spike and Slab Priors”. NIEHS PRIME Program Meeting. Durham, NC. 2019.

Contributed talk: “Nonparametric Bayes models for doubly robust causal inference for high-dimensional data”. European Causal Inference Conference. Florence, Italy. 2018

Contributed poster: “A flexible, tensor regression approach to estimating the health effects of chemical mixtures.”. IMS New Researchers Conference. Baltimore, MD. 2017

Contributed poster: “A flexible, tensor regression approach to estimating the health effects of chemical mixtures.”. Bayesian Nonparametric Conference. Paris, France. 2017

Contributed poster: “High dimensional confounding adjustment using continuous spike and slab priors”. Atlantic Causal Inference Conference. Raleigh, NC. 2017

Contributed talk: “High dimensional confounding adjustment using continuous spike and slab priors”. Eastern North American Region Conference. Washington DC. 2017

Contributed talk: “Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research.” Joint Statistical Meetings. Chicago, IL, 2016.

Contributed poster: “Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research.” International society for Bayesian Analysis Conference. Sardinia, Italy, 2016.

Contributed talk: “Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research.” Eastern North American Region Conference. Austin, Texas, 2016.

Contributed poster: “Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research.” International Conference on Health Policy Statistics. Providence, RI, 2015.

Contributed talk: “Spatial multiresolution analysis of irregularly spaced grids with application to the effect of PM<sub>2.5</sub> on birth weights.” Joint Statistical Meetings. Seattle, WA, 2015.

Contributed talk: “Mitigating bias in generalized linear mixed models: The case for Bayesian non-parametrics.” Eastern North American Region Conference. Miami, FL, 2015.

Contributed poster: “The positive effects of preferential sampling in environmental epidemiology.” New England Statistics Symposium. Boston, MA, 2014.

SOFTWARE	<i>DoublyRobustHD</i> : An R package for doubly robust estimation of causal effects in high dimensions (available at <a href="https://github.com/jantonelli111/DoublyRobustHD">github.com/jantonelli111/DoublyRobustHD</a> )	
	<i>SSGL</i> : An R package to implement the spike and slab group lasso model (available at <a href="https://github.com/jantonelli111/SSGL">github.com/jantonelli111/SSGL</a> )	
	<i>HDconfounding</i> : An R package for high-dimensional confounding adjustment for continuous or binary exposures (available at <a href="https://github.com/jantonelli111/HDconfounding">github.com/jantonelli111/HDconfounding</a> )	
	<i>NLinteraction</i> : An R package for flexible Bayesian estimation of interaction models (available at <a href="https://github.com/jantonelli111/NLinteraction">github.com/jantonelli111/NLinteraction</a> )	
	<i>Irregular2dWavelets</i> : An R package for two-dimensional wavelet decompositions on unequally spaced grids (available at <a href="https://github.com/jantonelli111/Irregular2dWavelets">github.com/jantonelli111/Irregular2dWavelets</a> )	
JOURNAL REFEREE	<i>Journal of the American Statistical Association</i> ; <i>Biometrics</i> ; <i>Annals of Applied Statistics</i> ; <i>Journal of the Royal Statistical Society Series A</i> ; <i>Biostatistics</i> ; <i>Epidemiology</i> ; <i>American Journal of Epidemiology</i> ; <i>Journal of Causal Inference</i> ; <i>Statistics in Medicine</i> ; <i>Statistical Methods in Medical Research</i> ; <i>Econometrics and Statistics</i> ; <i>Briefings in Bioinformatics</i> ; <i>Journal of Behavioral and Educational Statistics</i> ; <i>International Journal of Environmental Science and Technology</i> ; <i>Multivariate Behavioral Research</i> ; <i>Medical Decision Making</i> ; <i>Journal of Air and Waste Management Association</i>	
DEPARTMENTAL SERVICE	University of Florida Department of Statistics PhD Curriculum Committee	2018 - 2020
	Harvard Biostatistics Environmental Statistics Seminar organizer	2016 - 2017
	Harvard Biostatistics Computing Committee	2015 - 2016
PROFESSIONAL SERVICE	Member, ENAR Regional Advisory Board, 2020 - 2022	