## Joseph Lawrence Antonelli, Ph.D.


**Contact Information**

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**Current Position**

Assistant Professor, Department of Statistics — 2018 - present
University of Florida, Gainesville, FL

**Education**

Ph.D. Biostatistics, Harvard University — 2015
*Thesis:* Statistical methods for analyzing complex spatial and missing data
*Advisors:* Professors Francesca Dominici and Brent Coull

M.A. Biostatistics, Harvard University — 2013

B.S. Statistics, The University of Florida — 2011
*Summa Cum Laude*

**Research and Professional Experience**

Postdoctoral Research Fellow, Department of Biostatistics — 2015 - 2018
Harvard T.H. Chan School of Public Health, Boston, MA

Statistical Consultant, Brigham and Women's Hospital — 2015 - 2018
Boston, MA

Decision Support Analyst Intern, Google Inc. — 2013
Mountain View, CA

Environmental Statistics Trainee, National Institutes of Health — 2011 - 2015
Boston, MA

Statistical Programming Intern, Department of Pharmaceutical Outcomes and Policy — 2010 - 2011
Gainesville, FL

Actuarial Intern, Tower Hill Insurance Company — 2009
Gainesville, FL

**Teaching Experience**

Professor, University of Florida Department of Statistics — 2018-2019
*Course:* Introduction to Probability

Professor, University of Florida Department of Statistics — 2019
*Course:* Introduction to Statistical Inference

Course Developer, Harvard Department of Biostatistics — 2016
*Course:* Applied Bayesian Methodology

Teaching Assistant, Harvard Department of Biostatistics — 2014
*Course:* Advanced Topics in Clinical Trials

Teaching Assistant, Harvard Department of Biostatistics — 2013 - 2014
*Course:* Bayesian Methodology in Biostatistics.

Teaching Assistant, Harvard Department of Biostatistics 2012
*Course:* Statistical Programming in R

Teaching Assistant, Harvard Department of Biostatistics 2012
*Course:* Introduction to Python

## Advising Experience

Zikun Qin, Master's student 2019

Gary Wu, Undergraduate student 2019

Emmett Kendall, Undergraduate student 2019

Srijata Samanta, Research assistant 2018 - 2019

Armando Turchetta, Master's student (Co-advisor) 2017

## Honors and Awards

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

## Publications and Submitted Manuscripts

### Statistical Methodology and Epidemiology

**Antonelli JL**, Papadogeorgou G, Dominici F. Causal Inference in high dimensions: A marriage between Bayesian modeling and good frequentist properties. *arXiv: 1805.04899*. Under revision. *Biometrics*.

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. *arXiv: 1903.01979*. To appear. *Journal of the American Statistical Association*.

**Antonelli JL**, Cefalu M. Averaging causal estimators in high dimensions. *arXiv: 1906.09303*. Under revision. *Journal of Causal Inference*.

**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 $PM_{2.5}$ 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

Kurtz S, **Antonelli JL**, Persia T, Lehmann L. A national survey of physician assistants attitudes on assisted dying. Submitted.

Claggett B*, **Antonelli JL* (Co-first author)**, Henglin M, Watrous J, Lehmann K, Musso G, Correia A, Jonnalagadda S, 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. *arXiv:1710.03443*.

Nittrouer 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

### Invited Talks

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.

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 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 PM2.5 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 PM2.5 on birth weights." Harvard University Department of Biostatistics Environmental Health Seminar, 2014.

## Contributed Talks

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 PM2.5 on birth weights." Joint Statistical Meetings. Seattle, WA, 2015.

Contributed talk: "Mitigating bias in generalized linear mixed models: The case for Bayesian nonparametrics." 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

*DoublyRobustHD*: An R package for doubly robust estimation of causal effects in high dimensions (available at `github.com/jantonelli111/DoublyRobustHD`)

*SSGL*: An R package to implement the spike and slab group lasso model (available at `github.com/jantonelli111/SSGL`)

*HDconfounding*: An R package for high-dimensional confounding adjustment for continuous or binary exposures (available at `github.com/jantonelli111/HDconfounding`)

*NLinteraction*: An R package for flexible Bayesian estimation of interaction models (available at `github.com/jantonelli111/NLinteraction`)

*Irregular2dWavelets*: An R package for two-dimensional wavelet decompositions on unequally spaced grids (available at `github.com/jantonelli111/Irregular2dWavelets`)

## Journal Referee

*Journal of the American Statistical Association*; *Biometrics*; *Annals of Applied Statistics*; *Journal of the Royal Statistical Society Series A*; *Biostatistics*; *Journal of Causal Inference*; *Statistics in Medicine*; *Statistical Methods in Medical Research*; *Journal of Behavioral and Educational Statistics*; *Epidemiology*; *International Journal of Environmental Science and Technology*; *Multivariate Behavioral Research*; *Medical Decision Making*; *Journal of Air and Waste Management Association*

## Departmental service

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| University of Florida Department of Statistics PhD Curriculum Committee | 2018 - present |
| Harvard Biostatistics Environmental Statistics Seminar organizer | 2016 - 2017 |
| Harvard Biostatistics Computing Committee | 2015 - 2016 |

## Professional service

Member, ENAR Regional Advisory Board, 2020- 2022