Joseph Lawrence Antonelli, Ph.D.

Contact Information

University of Florida
Department of Statistics
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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

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 — 2022
Course: Advanced topics in causal inference

Professor, University of Florida Department of Statistics — 2020-2022
Course: Statistical learning in R

Professor, University of Florida Department of Statistics — 2020-2021
Course: Categorical data analysis

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

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

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

Advising Experience

Statistics and Biostatistics

Zhuochao Huang, PhD student	2023-present
Suyeon Kang, Postdoctoral research fellow	2022-present
Ruixuan Dong, Master's student	2022
Saurabh Bhandari, Master's student	2021
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

Shangchen Song, Ph.D, Biostatistics	2023-present
Simon Codjo, Ph.D, Agricultural Economics	2022-present
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, Braun D, Irene K, **Antonelli JL**. A spatial interference approach to account for mobility in air pollution studies with multivariate continuous treatments. *arXiv: 2305.14194*

Rudolph K, Williams N, Miles C, **Antonelli JL**, Diaz I. All models are wrong, but which are useful? Comparing parametric and nonparametric estimation of causal effects in finite samples. *arXiv: 2211.10310*

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*. To appear. *Journal of the Royal Statistical Society: Series A*.

Shin H, **Antonelli JL**. Improved Inference for Doubly Robust Estimators of Heterogeneous Treatment Effects. *arXiv: 2111.03594*. *Biometrics*. (Winner of the 2022 Van Ryzin Award for best overall student paper submitted to the 2022 ENAR conference.)

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

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

Linero A, **Antonelli JL**. The How and Why of Bayesian Nonparametric Causal Inference. *WIREs Computational Statistics*. (2022): e1583.

Antonelli JL, Papadogeorgou G, Dominici F. Causal Inference in high dimensions: A marriage between Bayesian modeling and good frequentist properties. *Biometrics*. 78.1 (2022): 100-114.

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*. 117.537 (2022): 184-197.

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, Parmigiani G, Dominici F. High dimensional confounding adjustment using continuous spike and slab priors. *Bayesian Analysis*. 14.3 (2019): 805.

Antonelli JL, Cefalu M, Palmer N, Agniel D. Doubly robust matching estimators for high dimensional confounding adjustment. *Biometrics*. 74.4 (2018): 1171-1179.

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*. 18.3 (2017): 553-568.

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* 11.2 (2017): 792.

Antonelli JL, Cefalu M, Bornn L. The positive effects of preferential sampling in environmental epidemiology. *Biostatistics* 17.4 (2016): 764-778.

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

Collaborative Publications

Beck B, **Antonelli JL**, LaScala-Gruenewald A. Chokehold Bans, Law Enforcement Officer Unions, and Police Killings. Submitted.

Nittrouer S, **Antonelli JL**, Lowenstein J.The Emergence of Bifurcated Structure in Children's Language. *Journal of Experimental Psychology*. (2022).

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 Analyzing Human Metabolomics Data. *Metabolites*. 12.6 (2022): 519.

Beck B, **Antonelli JL**. Effects of New York City's Neighborhood Policing Policy. *Police Quarterly*. (2020): 10986111211046991.

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*. 9.7 (2019): 143.

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*. 9.7 (2019): 128.

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. (2023).

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 Discussions

Antonelli JL. Invited discussion of "Causal inference under mis-specification: adjustment based on the propensity score." *Bayesian Analysis*. (2023).

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

Invited Presentations and Conference Participation

Invited seminar speaker. Inria Research Institute. France. 2023.

Invited conference speaker. ASA Florida Chapter Meeting. Gainesville, FL. 2023.

Invited conference speaker. CMStatistics. London, England. 2022.

Invited conference speaker. IMS International Conference on Statistics and Data Science. Florence, Italy. 2022.

Invited seminar speaker. Colorado State University, Department of Statistics. 2022.

Invited seminar speaker. Emory University, Department of Biostatistics. 2022.

Invited conference speaker. International Society for Bayesian Analysis (ISBA). Montreal, Canada. 2022.

Invited seminar speaker. University of Copenhagen, Department of Mathematical Sciences. 2022.

Invited seminar speaker. Università di Firenze, Department of Statistics. 2022.

Invited conference speaker. Eastern North American Regional (ENAR) Biometrics Conference. Houston, TX. 2022.

Invited seminar speaker. Center for Causal Inference at the University of Pennsylvania and Rutgers University. 2022.

Invited seminar speaker. Boston University, Department of Mathematics and Statistics. 2022.

Special invited session speaker. CMStatistics. Virtual. 2021.

Session organizer. CMStatistics. Virtual. 2021.

Invited seminar speaker. RAND Corporation. 2021.

Invited seminar speaker. The University of Glasgow, Department of Economics. 2021.

Invited seminar speaker. The Online Causal Inference Seminar. 2021.

Invited conference speaker. International Society for Environmental Epidemiology. Virtual. 2021.

Short course instructor. International Society for Bayesian Analysis (ISBA). Virtual. 2021.

Invited conference speaker. International Society for Bayesian Analysis (ISBA). Virtual. 2021.

Invited seminar speaker. The University of South Carolina, Department of Statistics. 2021.

Invited seminar speaker. Columbia University Causal Inference Seminar, Department of Biostatistics. 2021.

Session organizer. Eastern North American Regional (ENAR) Biometrics Conference. Virtual. 2021.

Invited conference speaker. CMStatistics. Virtual. 2020.

Session organizer. CMStatistics. Virtual. 2020.

Invited seminar speaker. Johns Hopkins University Causal Inference Seminar, Department of Biostatistics. 2020.

Invited seminar speaker. Eastern North American Regional (ENAR) Biometrics Conference. Nashville, TN. 2020.

Invited seminar speaker. Yale University. Department of Biostatistics. 2020.

Session organizer. CMStatistics. London. 2019.

Invited seminar speaker. University of Texas at Austin. Department of Statistics and Data Science. 2019.

Invited seminar speaker. Florida State University Department of Statistics. 2019.

Invited conference speaker. Atlantic Causal Inference Conference (ACIC). Montreal, Canada. 2019.

Invited seminar speaker. University of Tampa, Department of Mathematics. 2019.

Invited conference speaker. Eastern North American Regional (ENAR) Biometrics Conference. Philadelphia, PA. 2019.

Invited seminar speaker. University of Athens, Department of Mathematics. 2018.

Invited seminar speaker. University of Florida, Department of Biostatistics. 2018.

Invited seminar speaker. Boston Bayesians. 2018.

Invited conference speaker. International Indian Statistical Association Conference. Florida. 2018.

Invited seminar speaker. Yale University, Department of Biostatistics. 2017.

Invited seminar speaker. McGill University, Department of Biostatistics. 2017.

Invited seminar speaker. University of Florida, Department of Statistics. 2017.

Invited seminar speaker. New York University, Division of Biostatistics. 2017.

Invited conference speaker. CMStatistics. London. 2017.

Topic contributed talk. Joint Statistical Meetings. Baltimore, MD. 2017.

Invited webinar. EPA STAR Webinar. Virtual. 2017.

Invited seminar speaker. Georgetown University, Department of Mathematics. 2017.

Invited lecture. Georgetown University. 2017.

Invited webinar. Health Effects Institute Webinar Series. Virtual. 2016.

Invited seminar speaker. RAND corporation. 2016.

Invited seminar speaker. Harvard University Department of Biostatistics Environmental Health Seminar, 2014.

Contributed Presentations

Contributed talk. HBS/IMS New Researchers Conference. Boston, MA. 2021

Contributed poster. NIEHS PRIME Program Meeting. Durham, NC. 2019.

Contributed talk. European Causal Inference Conference. Florence, Italy. 2018

Contributed poster. IMS New Researchers Conference. Baltimore, MD. 2017

Contributed poster. Bayesian Nonparametric Conference. Paris, France. 2017

Contributed poster. Atlantic Causal Inference Conference. Raleigh, NC. 2017

Contributed talk. Eastern North American Region Conference. Washington DC. 2017

Contributed talk. Joint Statistical Meetings. Chicago, IL, 2016.

Contributed poster. International Society for Bayesian Analysis Conference. Sardinia, Italy, 2016.

Contributed talk. Eastern North American Region Conference. Austin, Texas, 2016.

Contributed poster. International Conference on Health Policy Statistics. Providence, RI, 2015.

Contributed talk. Joint Statistical Meetings. Seattle, WA, 2015.

Contributed talk. Eastern North American Region Conference. Miami, FL, 2015.

Contributed poster. 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*; *Bayesian Analysis*; *Biostatistics*; *Epidemiology*; *American Journal of Epidemiology*; *Journal of Causal Inference*; *Statistics in Medicine*; *Statistical Methods in Medical Research*; *Econometrics and Statistics*; *Data Science in Science*; *Briefings in Bioinformatics*; *Journal of Behavioral and Educational Statistics*; *Pharmaceutical Statistics*; *International Journal of Environmental Science and Technology*; *Multivariate Behavioral Research*; *Medical Decision Making*; *Journal of Air and Waste Management Association*

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

Associate Editor, Bayesian Analysis	2023 - present
Member, ENAR Regional Advisory Board	2020 - 2022