

Dafne Zorzetto, Ph.D.

Brown University

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Google Scholar

Updated: January 2026

RESEARCH INTERESTS

Causal Inference: Missing data problem in potential outcome framework, heterogeneity of causal effects, principal stratification, negative controls for unmeasured confounding, and multivariate outcome.

Bayesian Nonparametrics: Models and computational aspects, dependent Dirichlet process, infinite mixture models, missing data.

Bayesian Factor Analysis: Computational aspects, high dimensional-data, dimensional reduction, regression factor model, missing multivariate data, spike and non-local priors, latent variables.

Applications: Cancer biology, environmental policies, air pollution, public health, nutrition, socio-economic disparities, and social mobility.

CURRENT POSITION

Postdoctoral Research Associate November 2023 - October 2026

Brown University, Data Science Institute and Biostatistics

Working with Prof. [Arman Oganisian](#) and Prof. [Roberta De Vito](#).

EDUCATION

Visiting Ph.D. Scholar (2 years) *2022 - 2023*

Department of Biostatistics, Harvard T.H. Chan School of Public Health.

Supervisors: Prof. [Francesca Dominici](#) and Prof. [Falco J. Bargagli Stolfi](#)

Ph.D. in Statistics *2020-2023*

Department of Statistical Science, Università degli Studi di Padova.

Thesis title: *Bayesian Nonparametric Dependent Mixtures for Causal Inference with Applications to Air Pollution Epidemiology*

Supervisor: Prof. [Antonio Canale](#) (Università degli Studi di Padova)

Co-supervisor: Prof. [Francesca Dominici](#) (Harvard University).

Award for the best PhD thesis in Applied Statistics

Italian Statistical Society, 2025 edition

M.Sc. in Statistical Sciences *2018 - 2020*

Department of Statistical Science, Università degli Studi di Padova.

Thesis title: *Hierarchical Bayesian models for extreme values in the cylinder.*

Supervisor: Prof. [Antonio Canale](#).

Honors: 110/110 cum laude.

B.Sc. in Statistics for Economics and Business *2015 - 2018*

Department of Statistical Science, Università degli Studi di Padova.

Thesis title: *Inflation forecasting with GARCH models.*

Supervisor: Prof. [Luisa Bisaglia](#).

AWARDS & SCHOLARSHIP

- Award for the best PhD thesis in Applied Statistics - Italian Statistical Society, 2025 edition
 - Two-Year Fellowship Visiting Scientist Scholarship, Harvard University, 2022-2023.
 - Young researcher travel award, the 2022 ISBA world meeting.
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PUBLICATIONS

Publications & Preprint

- **Zorzetto D.**, Bargagli-Stoffi F.J., Canale A., Dominici F. (2024) *Confounder-Dependent Bayesian Mixture Model: Characterizing Heterogeneity of Causal Effects in Air Pollution Epidemiology*. *Biometrics*, 80(2), ujae025. [\[pdf\]](#) [\[Github-code\]](#)
- **Zorzetto D.**, Canale A., Mealli F., Dominici F., Bargagli-Stoffi F.J. (2025+) *Bayesian Nonparametrics for Principal Stratification with Continuous Post-Treatment Variables*. <https://arxiv.org/abs/2405.17669> [Submitted to *Bayesian Analysis*] [\[pdf\]](#) [\[Github-code\]](#)
- **Zorzetto D.**, Landy J., Zigler C., Parmigiani G., De Vito R. (2025+) *Multivariate Treatment Effect Estimation through Bayesian Factor Regression Model*. <https://arxiv.org/abs/2504.03480> [Under review at *Biometrics*] [\[pdf\]](#) [\[Github-code\]](#)
- Hu J.*, **Zorzetto D.***, Dominici F. (2025+) *A Bayesian Nonparametric Method to Adjust for Unmeasured Confounding with Negative Controls*. <https://arxiv.org/abs/2309.02631> [Accepted in *American Journal of Epidemiology*] [\[pdf\]](#) [\[Github-code\]](#)
- Landy J., **Zorzetto D.**, De Vito R., Parmigiani G. (2025+) *Causal Inference for Latent Outcomes Learned with Factor Models*. <https://arxiv.org/abs/2506.20549> [Under review at *Biostatistics*] [\[pdf\]](#)
- **Zorzetto D.***, Huang Y.*, De Vito R. (2025+) *Sparse Bayesian Factor Models with Mass-Nonlocal Factor Scores*. <https://arxiv.org/abs/2412.00304> [\[pdf\]](#)
- **Zorzetto D.***, Della Torre P.*, Petrone S., Dominici F., Bargagli-Stoffi F.J. (2025+) *Disentangling The Effects of Air Pollution on Social Mobility: A Bayesian Principal Stratification Approach*. <https://arxiv.org/abs/2412.00311> [Submitted to *Annals of Applied Statistics*] [\[pdf\]](#)
- Hansen B., **Zorzetto D.**, Edefonti V., De Vito R. (2025+) *Zero-Inflated Bayesian Multi-Study Infinite Non-Negative Matrix Factorization*. <https://arxiv.org/abs/2510.07518> [Under review at *Biometrics*] [\[pdf\]](#)
- Alfonzetti G.*, Rossi L.*, **Zorzetto D.***, Mealli F. (2025) *Model-free estimation of causal effects of different stimuli on neuron activities*. Chapter in *Advances*

in *Neural Data Science*, Springer Nature Switzerland
[pdf] [Github-code]

- **Zorzetto D.**, Bargagli-Stoffi F.J., Canale A., Dominici F. (2022). *Dependent Dirichlet Mixture Processes for Causal Inference*. Proceedings of the 36th International Workshop on Statistical Modelling. (pp. 618 - 623)
- **Zorzetto D.**, Canale A., Marani M. *A Centuries-long Record Reveals a Single Power-Law Distribution of Global Epidemic Intensity Despite Diverse Disease Dynamics*. [Submitted to Nature Communications]

* the authors contributed equally to the work.

Manuscripts to be submitted soon (draft and code available upon request)

- Lu Y., **Zorzetto D.**, De Vito R. *Bayesian Additive Regression Trees in causal inference for assessing the three level exposure*.
- Vanciu L., **Zorzetto D.**, A. M. Schmidt, Dominici F. *A Bayesian Spatial Models Tutorial for Epidemiology: Modeling Mortality Rate in Medicare Population*.
- **Zorzetto D.***, Xie Z. *, Stamp J., Oganisian A., De Vito R. *Bayesian causal forest for three ordered treatment levels: an application to nutritional epidemiology*

Manuscripts in preparation

- **Zorzetto D.**, Canale A. *Causal STAR BART for discrete outcome: an Application on Intimate Partner Homicides in Italy*.
- Udwin D., **Zorzetto D.**, De Vito R., Crawford L. *Multi-study factor analysis with missingness*.

PRESENTATIONS **Invited seminar**

- Multivariate Causal Effect: a Bayesian Regression Factor Model.
Duke University, Department of Statistics. November 2025
- Bayesian Nonparametrics for Principal Stratification with Continuous Post-Treatment Variables.
Bayesian Learning And Spatio-Temporal working group at Johns Hopkins Biostatistics. May 2025.
- Bayesian nonparametrics for causal inference: Applications in air pollution epidemiology.
University of Florida, Department of Statistics. January 2025.
- Air pollution: different Bayesian Causal Inference Methods.
Brown University, Department of Biostatistics. October 2024.
- Dependent nonparametric priors for causal inference problems.
BNP-ISBA webseminar. Joint presentation with [Antonio Canale](#). Online, June 2023

Invited talks

- Multivariate Causal Effect: a Bayesian Regression Factor Model.
SISBayes 2025
Padova (Italy), September 2025
- A causal Bayesian factor model for multivariate wildfire effect on chemical composition of air pollution.
SIS 2025 - Statistics for Innovation.
Genoa (Italy), June 2025
- Bayesian Nonparametrics for Principal Stratification with Continuous Post-Treatment Variables.
BIRS-CMO Frontiers of Bayesian Inference and Data Science Certificate
Oaxaca (Mexico), September 2024
- Causal STAR BART for discrete outcome.
SIS 2024 - The 52nd Scientific Meeting of the Italian Statistical Society
Bari (Italy), June 2024
- Confounder Dependent Bayesian Mixture Model: Application in Environmental Epidemiology.
GRASPA 2023.
Palermo (Italy), July 2023.
- Confounder Dependent Bayesian Mixture Model: Application in Environmental Epidemiology.
NESS - 36th New England Statistics Symposium: Statistics and Data science.
Boston (Massachusetts, USA), June 2023.

Contributed talks

- Bayesian Nonparametrics for Principal Stratification with Continuous Post-Treatment Variables.
14th International Conference on Bayesian Nonparametrics (BNP 14)
Los Angeles, California (USA), June 2025.
- Multivariate Causal Effects of Wildfire Smoke on Air Pollution: a Bayesian Causal Regression Factor Model.
BaYSM:O 2025 - The Bayesian Young Statisticians Meeting
Online, April 2025
- Multivariate Causal Effects: A Bayesian Regression Factor Model
The 2024 ISBA World Meeting.
Venice (Italy), July 2024.
- Confounders-Aware Shared-Atoms Bayesian Hierarchical Mixture Model for Principal Stratification
BaYSM:O 2023 - The Bayesian Young Statisticians Meeting
Online, November 2023
- Characterizing Heterogeneity of Causal Effects in Air Pollution in Florida
SIS 2023 - Statistical Learning, Sustainability and Impact Evaluation.
Ancona (Italy), June 2023
- Bayesian Nonparametric for Causal Inference.
BNP13 - 13th International Conference on Bayesian Nonparametrics.
Puerto Varas (Chile), October 2022.
- Dependent Dirichlet mixture processes for Causal Inference.
BaYSM 2022. Centre de recherches mathématiques at Université de Montréal.
Montréal (Canada). June 2022

Poster presentations

- Bayesian Nonparametrics for Causal Inference.
BISP14 - Workshop on Bayesian Inference in Stochastic Processes
Milan (Italy), May 2025
 - Multivariate Causal Effects: A Bayesian Regression Factor Model
BaYSM 2024
Venice (Italy), June 2024.
 - Bayesian Nonparametrics for Principal Stratification: an Application on Environmental Policies Effects on Health
Bayesian Causal Inference Summer school.
Firenze (Italy), July 2023.
 - Bayesian Nonparametric for Heterogeneity in Treatment Effect.
Atlantic Causal Inference Conference
Austin (Texas, USA), May 2023
 - Probit Stick-Breaking Process for Causal Inference.
36th International Workshop on Statistical Modelling.
Trieste (Italy), July 2022.
 - Probit Stick-Breaking Process for Causal Inference.
The 2022 ISBA World Meeting.
Montréal (Canada), July 2022.
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TEACHING

- A.Y. 2023/24:
Introduction at Causal Inference at Statistical Learning [DATA2020]
Data Science Institute, Brown University
- A.Y. 2024/25:
Introduction at Causal Inference at Statistical Learning [DATA2020]
Data Science Institute, Brown University

MENTORING EXPERIENCES

- *Statistics.* Academic Tutor, Department of Biology.
Università degli Studi di Padova, 2020

CO-ADVISING

- Leo Vanciu *A.Y. 2023/24*
Undergraduate, Harvard College
Primary advisor: Francesca Dominici (Harvard University)
- Francesco Martella *A.Y. 2023/24*
Master's student, University of Padova
Primary advisor: Antonio Canale (University of Padova)
- Paolo Dalla Torre *A.Y. 2023/24*
Master's student, Bocconi Univerity
Primary advisors: Sonia Petrone (Bocconi Univerity) and Falco J. Bargagli-Stoffi (University of California, Los Angeles)
- Yingjie Huang *A.Y. 2024/25*
Master's student, Brown Univerity
Primary advisor: Roberta De Vito (Brown University)

- Lu, Yifan A.Y. 2024/25
Master's student, Brown University
 Primary advisor: Roberta De Vito (Brown University)
 - Xie, Zizhao A.Y. 2024/25
Master's student, Brown University
 Primary advisor: Roberta De Vito (Brown University)
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SERVICES TO PROFESSION

Editorial activity: reviewer

- Biometrical Journal
- Annals of Applied Statistics
- Biometrics
- Biostatistics

Organization of scientific events

- *Women in Data Science* Ambassador 2024
 Providence, Rhode Island, United States — North America
Part of the organization committee for the WiDS Providence Conference hosted by Brown University on October 2024.
- Organizer of *Explain like I'm an Undergrad*
 Padova, Italy. Spring 2023
Weekly seminars that want to foster connections among PhD students and postdocs in the statistics department at Padova, as well as beyond, and provide with the opportunity to deliver engaging talks using a lighthearted, concise, and accessible presentation style, like to explaining complex concepts to undergraduate students in Statistics.

Contribution of scientific events

- Judge for the *hackathon* Hack@Brown
 Brown University. Spring 2024
- Judge for the *hackathon* Hack@Brown
 Brown University. Spring 2025
- Volunteer for *StatisticAll*
 Treviso, Italy. 2016
Statistical games and activities to show the magic of statistics to kids and adults, in collaboration with ISTAT (Italian Statistics Institute)

Memberships

- International Society for Bayesian Analysis (ISBA) 2022-present
 - j-ISBA (junior section of ISBA) 2022-present
 - Bayesian Nonparametrics (ISBA section) 2022-present
 - EnviBayes (ISBA section on Environmental Sciences) 2022-present
 - Italian Statistic Society 2023-present
 - Young section of Italian Statistic Society 2023-present
 - Society for Causal Inference 2023
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SKILLS

Programming

Programming languages: R ; Python; Matlab.

Other statistical Software: Excel; SAS; MySQL.

Markup Languages: HTML; LaTeX; Markdown.

Other Software: Git/GitHub; Windows and relative software.

Languages

Italian: native;

English: full professional proficiency.