


# Antonio Canale

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## CONTACT INFORMATION

Dipartimento di Scienze Statistiche  
Università degli Studi di Padova  
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## RESEARCH INTERESTS

Bayesian nonparametrics, functional data analysis, multiscale methods, data science, machine learning, extreme value analysis, applied statistics.

## CURRENT POSITION

Associate professor,  
[Dipartimento di Scienze Statistiche, Università degli Studi di Padova](#). (since 03/2020)

## PAST POSITIONS

Assistant professor, (*Ricercatore SECS-S/01, Legge 240/10 tipo B*),  
[Dipartimento di Scienze Statistiche, Università degli Studi di Padova](#). (from 03/2017 to 02/2020)

Fixed term assistant professor, (*Ricercatore SECS-S/01, Legge 240/10 tipo A*),  
[Dipartimento ESOMAS, Università degli Studi di Torino](#). (from 10/2012 to 02/2017)

Research Affiliate,  
[de Castro Statistics Initiative, Collegio Carlo Alberto](#) (from 02/2013 to 05/2018)

Postdoctoral fellow,  
[Dipartimento di Statistica e Matematica applicata “Diego de Castro”, Università degli Studi di Torino](#) (from 01/2012 to 09/2012)

## EDUCATION

[Università degli Studi di Padova](#), Padova, Italy

- Ph.D., Statistics (*Dottorato di ricerca in Statistica*), [Department of Statistical Sciences](#) (From 1/2009 to 12/2011, thesis defence 02/2012)
- M.S., Statistics and Computer Science (*Laurea Specialistica in Statistica e Informatica*), [School of Statistics](#) (From 10/2006 to 07/2008, thesis defence 07/2008)
- B.S., Statistics and Management (*Laurea Triennale in Statistica e Gestione delle Imprese*), [School of Statistics](#) (From 10/2003 to 02/2006, thesis defence 02/2006)

## AWARDS

- *Abilitazione Scientifica Nazionale a professore di I fascia, settore 13/D1* (National Scientific Qualification for Full Professor in Statistics), from September 2019
- *Abilitazione Scientifica Nazionale a professore di II fascia, settore 13/D1* (National Scientific Qualification for Associate professor in Statistics), from April 2017
- Winner of the *Young Statistician Award* sponsored by the European Network on Business and Industrial Statistics (2017)
- Finalist of the *L.J. Savage Award 2013* for outstanding doctoral dissertations in Bayesian econometrics and statistics (Applied Methodology section) sponsored by the American Statistical Association, International Society of Bayesian Analysis and NBER-NSF (2014)
- Winner of the competition “*Statistica, Open Data e Società*” (“*Statistics, Open data and Society*”), Municipality of Milan and Università Cattolica, Milan, Italy (11/2013)
- Winner of the competition “*Technology foresight and Statistics for the future*”, Bar Camp, SCo 2013, Milan, Italy (09/2013)
- Bologna Experience for Superior Talents - 2006, ALMA graduate school, Bologna, Italy (09/2006)

Plenary presentations

- *Bayesian dimensionality reduction*; *International Workshop on Statistical Modelling*, Trieste, July, 18-22, 2021
- Shallow learning for data science; *SIS 2019 Intermediate meeting*, Milan, Italy, June 12-14, 2019
- Constrained Functional Time Series: an Application to demand and supply curves in the Italian Natural Gas Balancing Platform; *ENBIS-17*, Naples, Italy, September 9-14, 2017

Invited presentations

- *Bayesian nonparametric analysis for the detection of spikes in noisy calcium imaging data*, O'Bayes, Santa Cruz, California, USA, September, 2022
- Escaping the curse of dimensionality in model-based clustering; *Working Group on Model-Based Clustering Summer Session*, Αθήνα, Greece, 25-30 ottobre, 2021
- Bayesian non-asymptotic extreme value hierarchical models *14th International Conference of the ERCIM WG on Computational and Methodological Statistics*, London, UK, December, 2021
- Bayesian clustering of high-dimensional data *13th International Conference of the ERCIM WG on Computational and Methodological Statistics*, London, UK, December, 2020
- Constrained Functional Time Series; *10th International Conference of the ERCIM WG on Computational and Methodological Statistics*, London, UK, December 16-18, 2017
- Multiscale mixtures of kernels; *11th conference on Bayesian Nonparametrics*, Paris, France, June 26-30, 2017
- Scalable multiscale density estimation; *SisBayes Meeting*, Rome, Italy, February 7-8, 2017
- Statistics and Data Science; *Data Science and its Relationship to Big Data and Data-Driven Decision Making*, Google, Milan, Italy, January 17, 2017
- Constrained Functional Time Series: an Application to the Italian Natural Gas Balancing Platform; *Mercati energetici e metodi quantitativi: un ponte tra Università e Aziende*, Padova, Italy, October 8, 2015
- Multiscale Bernstein Polynomial for densities; *7th International Conference of the ERCIM WG on Computing and Statistics*, Pisa, Italy, December 6-8, 2014
- Statistics: pushed or pulled by technology? *Barcamp@SC0 2013*, Milan, Italy, September 12, 2013
- A Bayesian nonparametric model for data on different scale of measure; an application to customer base management of telecommunications companies; *SIS Scientific Meeting 2013*, Brescia, Italy, 16-18 June, 2013
- Bayesian multivariate mixed-scale density estimation; *5th International Conference of the ERCIM WG on Computing and Statistics*, Oviedo, Spain, December 1-3, 2012
- Bayesian nonparametric models for count data. Phone traffic analysis; *Final workshop on Bayesian nonparametric models for functional data: theory and applications in biometry and marketing*, Padova, Italy, October 5, 2012
- Informative Bayesian inference for the skew normal; *Third Palestinian Conference on Modern Trends in Mathematics and Physics*, Hebron, Palestine, July 16-18, 2012
- A Bayesian nonparametric model for count functional data; *SIS Scientific Meeting 2012*, Rome, June 20-22, 2012
- Dirichlet process mixture of rounded skew normal for the estimation of probability mass functions; *IV international skew workshop*, Santiago, Chile, May 16-19 2011
- Some Inferential results on the extended skew-normal distribution in the scalar case; *Summer mini conference in Statistic and probability*, McMaster University, Hamilton, Ontario, Canada, July 31, 2009

#### Contributed presentations

- Multiscale Bernstein Polynomial for densities; *10th Conference on Bayesian Nonparametrics*, Raleigh, NC, USA, June 22-26, 2015
- Age-specific probability of childbirth via Bayesian nonparametric location-scale-shape mixtures; *International Biometric Conference*, Florence, Italy, 6-11 July, 2014
- Bayesian nonparametric spatial modelling of ordinal periodontal data; *SIS 2014*, Cagliari, Italy, 9-14 June, 2014
- Analysis of demand and supply curves in the Italian natural gas market through functional time series. *SCO 2013*, Milan, Italy, 9-11 September, 2013
- Bayesian nonparametric predictions for count time series; *Final Conference of PRIN 2008*, Naples, May 17–19, 2012
- Bayesian modeling of count processes; *SCo 2011*, Padova, Italy, September 19-21 2011
- Bayesian Kernel mixtures for counts; *Applied Bayesian Summer School*, Bolzano, Italy, June 11-15 2010 (participants talk)
- Statistical aspects in the extended skew normal model; *Workshop on Skew Symmetric Distributions*, Benevento, Italy, March 16–20 2009
- Some preliminar results on the information matrix of the extended skew normal model; *Workshop on Skew Symmetric Probability Distributions*, Bertinoro (FC), Italy, April 6 - 10 2008

#### Poster presentations

- Convex Mixture Regression for Quantitative Risk Assessment; *2018 ISBA world meeting*, Edinburgh, UK, 24-29 June, 2018
- Bayesian nonparametric location-scale-shape mixtures; *9th Bayesian Nonparametric workshop*, Amsterdam, Netherlands, 9-13 June, 2013
- Bayesian multivariate mixed-scale density estimation; *2012 ISBA world meeting*, Kyoto, Japan, June 25–29, 2012
- Bayesian Kernel mixtures for counts; *8th Bayesian Nonparametric workshop*, Veracruz, Mexico, June 26-30 2011

#### INVITED SEMINARS

*Department of Statistics*, Rice University, (8/02/2021, *web seminar, due to CoViD-19 travel restrictions*), *Department of Mathematics*, University of Oslo, (21/04/2020, *web seminar, due to CoViD-19 travel restrictions*), *Department of Biostatistics*, Virginia Commonwealth University, (2/11/2018), *Department of Statistical Science*, Duke University, (7/09/2018), *Autorità per le Garanzie nelle Comunicazioni*, Roma, (14/03/2017), *Department of Decision Sciences*, Bocconi University (12/05/2016), *School of Mathematics And Statistics*, University College Dublin (31/03/2016), *Trinity College Dublin* (30/03/2016), *School of Computer Science and Statistics*, *Department of Statistics*, University of Bologna (19/11/2015), *Department of Statistical Sciences*, Università Cattolica, Milano (14/11/2013), *Dipartimento di Scienze Economiche, Aziendali, Matematiche e Statistiche “Bruno de Finetti”*, Università degli Studi di Trieste (16/10/2013); *Department of Economics and Statistics*, Università degli studi di Udine (26/09/2013); *PhD school in Statistics*, Università degli Studi di Padova (17/01/2013);

#### VISITING PERIODS

- Department of Statistical Science, Duke University, Durham, NC, USA (08/2018 – 12/2018)
- Statistical and Applied Mathematical Sciences Institute (SAMSI), NC, USA (06/2015)
- Department of Statistics and Data Science, University of Texas at Austin, TX, USA (10/2014)
- Department of Statistical Science, Duke University, Durham, NC, USA (07/2011 – 08/2011)
- Department of Statistical Science, Duke University, Durham, NC, USA (02/2010 – 12/2010)
- Department of Mathematics and Statistics, McMaster University, Canada (07/2009 – 08/2009)

## FUNDING

### Research projects

- Member of the project “RESILIENCE – Extreme Storms in the Italian North-East: frequency, impacts and projected changes” grant: Ricerca Scientifica di Eccellenza; grantor: Fondazione Cariparo (2022-2025)
- Principal investigator of “Bayesian models for single-cell RNA-Seq data”; grant: *SID: Investimento Strategico di Dipartimento*; grantor: Dipartimento di Scienze Statistiche, Università degli Studi di Padova (2021-2023)
- Principal investigator of “[Bayesian nonparametrics for complex data](#)”; grant: *STARS: Supporting Talent in Research*; grantor: Università degli Studi di Padova (2018-2019)
- Principal investigator of “Locally nonconcurrent functional regression models”; grant: *SID: Investimento Strategico di Dipartimento*; grantor: Department of Statistical Sciences, Università degli Studi di Padova (2018-2019)
- Co-investigator of “Modern Bayesian nonparametric methods”; grant: *PRIN2015: Progetto di Rilevanza Nazionale*; grantor: Italian Ministry of Education, Universities, and Research (2016-2018)
- Co-investigator of “Bayesian inference on brain network data”; grant: *Progetto di Ricerca di Ateneo*; grantor: Università degli Studi di Padova (2016-2017)
- Principal investigator of the project “Bayesian inference for high-complexity multidimensional data”; grant: *Progetto Giovani Ricercatori*, grantor: Università degli Studi di Torino (2013-2015)

### Research projects funded by private companies

- Scientific coordinator of “Statistical models for customer attrition in no profit organizations”, funder Moxoff S.p.A. (2014).
- Scientific coordinator of “Price forecast models and supply and demand curves models in Italian natural gas market”, funder Moxoff S.p.A., client: Oil-and-gas company (2013).

## SERVICE TO PROFESSION

### Editorial Activity

- *Associate Editor*

[Journal of the Royal Statistical Society, Series C \(Applied Statistics\)](#) (2019-2022)

[Computational Statistics and Data Analysis](#) (2018-)

- *Referee for* (in alphabetical order): Annals of Applied Statistics, Bayesian Analysis, Biometrical journal, Biometrika, Computational Statistics, Computational Statistics and Data Analysis, Electronic Journal of Statistics, International Journal of Forecasting, Journal of Applied Statistics, Journal of the American Statistical Association, Journal of Business and Economic Statistics, Journal of the Korean Statistical Society, Journal of Multivariate Analysis, Journal of Statistical Computation and Simulation, Journal of the Royal Statistical Society (Series B), Journal of the Royal Statistical Society (Series C), Operations Research, Sankhyā, Statistical Methods and Applications, Statistics and Computing, Statistics in Medicine;
- *Reviewer for*: [Mathematical Reviews](#)
- *Reviewer for*: CRC press, Taylor and Francis Group

### Positions in Academic Societies

- Elected member of the board (2018-now) of the Statistics and [Data Science Section](#) (SIS-SDS) of the Italian Statistical Society;
- Elected member of the board (2014-2015) and chair (2015) of the [young section](#) (ySIS) of the Italian Statistical Society;

## Organization of Scientific Events

- Scientific committee [IMS International Conference on Statistics and Data Science](#), Firenze, December 2022
- Scientific and Local committee of [Data Research Camp 2022](#), Venezia, July, 2022
- Organizer of the invited session *Advances in Bayesian factor models*, [ISBA2022](#), Montreal, Canada, June, 2022
- Scientific Program Committee of [LI scientific meeting of the Italian Statistical Society](#), Caserta, Giugno 2022
- Joint Organizer of the organized track-session *Bayesian semi- and non-parametric modelling* of the [CMStatistics2020](#), e-conference, December 2020
- Joint Organizer of the organized track-session *Bayesian semi- and non-parametric modelling* of the [CMStatistics2019](#), London, December 2019
- Member of the Scientific and Organizing committee of the [Data Research Camp 2019](#), Venice, July, 2019
- Joint Organizer of the organized session *Bayesian Modelling and Computation* of the [CM-Statistics2018](#), Pisa, December 2018
- Member of the scientific committee of the Joint Meeting of SIS-SDS and itENBIS on [Statistics and Data Science: new Developments for Business and Industrial Applications](#), Torino, May 2018
- Member of the organising committee of the 5th [StaTalk](#), Padova, November 2017
- Joint Organizer of the specialised session *Data Science for Business* of the [49th scientific meeting of the Italian Statistical Society](#), Florence, June 2017
- Joint Organizer of the satellite event [Start Up Research](#) of the [49th scientific meeting of the Italian Statistical Society](#), Pontignano, June 2017
- Member of the scientific program committee of the [48th scientific meeting of the Italian Statistical Society](#), Salerno, June 2016
- Member of the organising committee of the 2nd [StaTalk on Bayesian Nonparametrics](#), Moncalieri, February 2016
- Member of the organising committee of [StatisticAll](#), Treviso, September 2015
- Chair of the conference [Statistica e Data Science per il Business](#), Padova, 8th September, 2015 (Satellite events of the SIS intermediate scientific meeting);
- Joint organiser of [Stats under the Stars](#), Padova, 8th-9th September, 2015 (Satellite events of the SIS intermediate scientific meeting);

## Dissemination and outreach

- Co-organizer of [DataBeers Padova](#)

## PUBLICATIONS

### Statistical articles

34. Canale, A., Corradin, R., Nipoti, B., (2022) [Importance conditional sampling for Pitman-Yor mixtures](#), *Statistics and Computing*, 32, 40
33. D'Angelo, L., Canale, A., Yu, Z., Guindani, M. (2022) [Bayesian nonparametric analysis for the detection of spikes in noisy calcium imaging data](#), *Biometrics*, in press
32. Schiavon, L., Canale, A., Dunson, D. (2022) [Generalized infinite factorization models](#), *Biometrika*, in press, doi.org/10.1093/biomet/asab056
31. Canale, A., Lijoi, A., Nipoti, B., Prünster, I., (2022) [Inner spike and slab Bayesian non-parametric models](#), *Econometrics and Statistics*, in press, doi.org/10.1016/j.ecosta.2021.10.017

30. Corradin, R., Canale, A., Nipoti, B., (2021), [BNPmix: an R package for Bayesian non-parametric modelling via Pitman-Yor mixtures](#), *Journal of Statistical Software*, 100, 15
29. Stefanucci, M., Canale, A. (2021) [Multiscale stick-breaking mixture models](#), *Statistics and Computing*, 31, 13
28. Barrientos A. F., Canale, A., (2021) [A Bayesian goodness-of-fit test for regression](#), *Computational Statistics and Data Analysis*, 155, 107104
27. Schiavon, L., Canale, A., (2020), [On the truncation criteria in infinite factor models](#), *Stat*, 9(1), e298
26. Kowal, D. R., Canale, A., (2020), [Simultaneous Transformation and Rounding \(STAR\) Models for Integer-Valued Data](#), *Electronic Journal of Statistics*, 14, 1744–1772
25. Rossini, J., Canale, A., (2019), [Quantifying prediction uncertainty for functional-and-scalar to functional autoregressive models under shape constraints](#), *Journal of Multivariate Analysis*, 170, 221–231
24. Durante, D., Canale, A., Rigon, T. (2019), [A nested expectation-maximization algorithm for latent class models with covariates](#), *Statistics and Probability letters*, 146, 97–103
23. Kon Kam King, G., Canale, A., & Ruggiero, M. (2019), [Bayesian functional forecasting with locally-autoregressive dependent process](#), *Bayesian Analysis*, 14, 1121–1141.
22. Carmona, C., Nieto-Barajas, L., Canale, A. (2019), [Model-based approach for household clustering with mixed scale variables](#), *Advances in Data Analysis and Classification*, 13, 559–583
21. Canale, A., Durante, D., Dunson, D. (2018), [Convex Mixture Regression for Quantitative Risk Assessment](#), *Biometrics*, 74, 1331–1340
20. Canale, A., Lijoi, A., Nipoti, B., Prünster, I., (2017), [On the Pitman-Yor process with spike and slab base measure](#), *Biometrika*, 104, 3, 681–697
19. Canale, A., (2017), [msBP: An R package to perform Bayesian nonparametric inference using multiscale Bernstein Polynomials mixtures](#), *Journal of Statistical Software*, 78, 6
18. Canale, A., Prünster, I., (2017), [Robustifying Bayesian nonparametric mixtures for count data](#), *Biometrics*, 73, 174–184
17. Canale, A., De Blasi, P., (2017), [Posterior asymptotics of nonparametric location-scale mixtures for multivariate density estimation](#), *Bernoulli Journal*, 23, 379–404
16. Canale, A., Ruggiero, M., (2016), [Bayesian nonparametric forecasting of monotonic functional time series](#), *Electronic Journal of Statistics*, 10, 3265–3286
15. Canale, A., Vantini, S., (2016), [Constrained Functional Time Series: Applications to the Italian Gas Market](#), *International Journal of Forecasting*, 32, 1340–1351
14. Canale, A., Kenne Pagui, E. K., Scarpa, B., (2016), [Bayesian modeling of university first-year students' grades after placement test](#), *Journal of Applied Statistics*, 43, 3015–3029
13. Bandyopadhyay D., Canale, A., (2016), [Nonparametric spatial ordinal models for clustered periodontal data](#), *Journal of the Royal Statistical Society-Series C*, 65, 619–640.
12. Kenne Pagui, E. C., Canale, A., (2016), [Pairwise likelihood inference for multivariate ordinal responses with applications to customer satisfaction](#), *Applied Stochastic Models in Business and Industry*, 32, 273–282
11. Canale, A., Dunson, D. B., (2016), [Multiscale Bernstein polynomials for densities](#), *Statistica Sinica*, 26, 3, 1175–1195
10. Bisaglia, L., Canale, A., (2016), [Bayesian nonparametric forecasting for INAR models](#), *Computational Statistics and Data Analysis*, 100, 70–78.
9. Canale, A., Scarpa, B., (2016), [Bayesian nonparametric location-scale-shape mixtures](#), *Test*, 25, 1, 113–130.

8. Canale, A., Dunson, D. B., (2015), [Bayesian multivariate mixed-scale density estimation](#), *Statistics and Its Interface*, 8, 2, 195–201.
7. Canale, A., (2015), [A note on regions of given probability for the extended skew-normal distribution](#), *Communications in Statistics*, 44, 2507–2516
6. Canale, A., Scarpa, B., (2015), [Age-specific probability of childbirth. Smoothing via Bayesian nonparametric mixture of rounded kernels](#), *Statistica*, 75, 1, 101–110.
5. Canale, A., Lunardon, N., (2015), [Churn prediction in telecommunications industry. A study based on Bagging classifiers](#), *Statistica applicata - Italian Journal of Applied Statistics*, 24, 3, 279–290
4. Canale, A., Dunson, D. B., (2013), [Nonparametric Bayes modelling of count processes](#), *Biometrika*, 100, 4, 801–816
3. Bisaglia, L., Canale, A., (2012), [Bayesian nonparametric predictions for count time series](#), *Quaderni di Statistica*, 14, 49–52
2. Canale, A., Dunson, D. B., (2011), [Bayesian Kernel Mixtures for Counts](#), *Journal of American Statistical Association*, 106, 1528–1539
1. Canale, A., (2011), [Statistical aspects in the extended skew-normal model](#), *Metron*, LXIX, 3, 279–295

#### Collaborative works

- Livsey J., Alavaisha, E. Tumbo, M., Lyon, S. W., Canale, A., Cecotti, M., Lindborg, R., and Manzoni S., (2020), [Soil carbon, nitrogen and phosphorus contents along a gradient of agricultural intensity in the Kilombero Valley, Tanzania](#), *Land*, 9, 121
- Barbon, S., Stocco, E., Dalzoppo, D., Todros, S., Canale, A., Boscolo-Berto, R., . . . , & Porzionato, A. (2020). [Halogen-Mediated Partial Oxidation of Polyvinyl Alcohol for Tissue Engineering Purposes](#). *International Journal of Molecular Sciences*, 21(3), 801.

#### Books (as Editor)

- Canale, A., Durante, D., Paci, L., and Scarpa, B. (Eds.) (2019), [Studies in Neural Data Science, StartUp Research 2017](#), Springer Proceedings in Mathematics and Statistics, ISBN 978-3-030-00038-7

#### Book chapters and international conference proceedings (with peer-review)

- Wang, Y., Canale, A., Dunson, D.B., (2016), [Scalable geometric density estimation](#), In *Artificial Intelligence and Statistics (AISTATS), Proceedings of Machine Learning Research*, 51, 857–865
- Canale, A., Lijoi, A., Prüenster I., (2016), [Bayesian Nonparametrics](#). In *Wiley StatsRef: Statistics Reference Online*, John Wiley & Sons, Ltd.

#### Dissemination

- Canale, A., Durante, D., Paci, L., Scarpa, B. (2018) [Connecting statistical brains](#), *Significance*, 15, 38–40

#### Software

- Canale, A., Durante, D., Falcioni, A., Galtarossa, L., Rigon T., (2020), [CoMiRe: Convex Mixture Regression](#), *R package, version 0.7*
- Corradin, R., Canale, A., Nipoti, B. (2019), [BNPmix: Bayesian Nonparametric Mixture Models](#), *R package, version 0.2.6*
- Canale, A., (2017), [msBP: Multiscale Bernstein Polynomials for Densities](#), *R package, version 1.3*

- Carmona C., Nieto-Barajas L., Canale, A., [BNPMIXcluster: Bayesian Nonparametric Model for Clustering with Mixed Scale Variables](#), *R package version 1.2.4*
- Canale, A., (2016), [rmp: Rounded Mixture Package](#), *R package, version 2.0*,
- Kenne Pagui, E. C., Canale, A., (2014), [Plordprob: Multivariate Ordered Probit Model via Pairwise Likelihood](#), *R package, version 1.0*,