

Antonio Canale

CONTACT

INFORMATION

Dipartimento di Scienze Statistiche
Università degli Studi di Padova
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35121 Padova, Italy

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RESEARCH INTERESTS

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

CURRENT POSITION

Assistant professor, (*Ricercatore SECS-S/01, Legge 240/10 tipo B*),
Dipartimento di Scienze Statistiche, Università degli Studi di Padova. (since 03/2017)

PAST POSITIONS

Academic

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)

Business

Statistical Research Consultant, MOXOFF S.p.A., spinoff of the Polytechnic of Milan, in collaboration with the MOX group, Polytechnic of Milan. (from 01/2012 to 12/2012)

Freelance Statistical Business Consultant (from 2007 to 2010)

EDUCATION

Università degli Studi di Padova, Padova, Italy

Ph.D., Statistics (*Dottorato di ricerca in Statistica*), Department of Statistics (From 1/2009 to 12/2011, thesis defense 02/2012)

- Thesis Topic: Bayesian nonparametric models for count data
- Advisor: Bruno Scarpa and David B. Dunson (co-supervisor)

M.S., Statistics and Computer Science (*Laurea Specialistica in Statistica e Informatica*), Department of Statistics (From 10/2006 to 07/2008, thesis defense 07/2008)

- Thesis Topic: Statistical Aspects of the Extended skew-normal model
- Advisor: Adelchi Azzalini

B.S., Statistics and Management (*Laurea Triennale in Statistica e Gestione delle Imprese*), Department of Statistics (From 10/2003 to 02/2006, thesis defense 02/2006)

AWARDS

- *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)
- Young researcher travel award, 2012 ISBA world meeting, Kyoto, Japan (03/2012)
- Young researcher travel award, 8th BNP workshop, Veracruz, Mexico (03/2011)
- BEST 2006 - Bologna Experience for Superior Talents, ALMA graduate school, Bologna, Italy (09/2006)

CONFERENCES PRESENTATION

Invited presentations

- Constrained Functional Time Series; *10th International Conference of the ERCIM WG on Computational and Methodological Statistics*, London, UK, December 16-18, 2017 (invited talk)
- 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 plenary talk)
- Multiscale mixtures of kernels; *11th conference on Bayesian Nonparametrics*, Paris, France, June 26-30, 2017 (invited talk)
- Scalable multiscale density estimation; *SisBayes Meeting*, Rome, Italy, February 7-8, 2017 (invited talk)
- Statistics and Data Science; *Data Science and its Relationship to Big Data and Data-Driven Decision Making*, Google, Milan, Italy, January 17, 2017 (invited talk)
- 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 (invited talk)
- Multiscale Bernstein Polynomial for densities; *7th International Conference of the ERCIM WG on Computing and Statistics*, Pisa, Italy, December 6–8, 2014 (invited talk)
- Statistics, pushed or pulled by technology? *Barcamp @ SC0 2013*, Milan, Italy, 12 September, 2013 (invited talk)
- 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 (invited talk)
- Bayesian multivariate mixed-scale density estimation; *5th International Conference of the ERCIM WG on Computing and Statistics*, Oviedo, Spain, December 1–3, 2012 (invited talk)
- 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 (invited talk)

- Informative Bayesian inference for the skew normal distribution; *Third Palestinian Conference on Modern Trends in Mathematics and Physics*, Hebron, Palestine, July 16–18, 2012 (invited talk)
- A Bayesian nonparametric model for count functional data; *SIS Scientific Meeting 2012*, Rome, June 20–22, 2012 (invited talk)
- Dirichlet process mixture of rounded skew normal for the estimation of probability mass functions; *IV international skew workshop*, Santiago, Chile, May 16–19 2011 (invited talk)
- 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 (invited talk)

Contributed presentations

- Multiscale Bernstein Polynomial for densities; *10th Conference on Bayesian Nonparametrics*, Raleigh, NC, USA, June 22–26, 2015 (contributed talk)
- Age-specific probability of childbirth via bayesian nonparametric location-scale-shape mixtures; *International Biometric Conference*, Florence, Italy, 6–11 July, 2014 (contributed talk)
- Bayesian nonparametric spatial modelling of ordinal periodontal data; *SIS 2014*, Cagliari, Italy, 9–14 June, 2014 (contributed talk)
- Analysis of demand and supply curves in the Italian natural gas market through functional time series. *SCO 2013*, Milan, Italy, 9–11 September, 2013 (contributed talk)
- Bayesian nonparametric predictions for count time series; *Final Conference of PRIN 2008*, Naples, May 17–19, 2012 (contributed talk)
- Bayesian modeling of count processes; *SCo 2011*, Padova, Italy, September 19–21 2011 (contributed talk)
- 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 (contributed talk)
- 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 (contributed talk)

Poster presentations

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

INVITED SEMINARS

Department of Mathematics, University of Oslo, (26/03/2019), *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), Research Triangle Park, 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, Hamilton, Ontario, Canada (07/2009 – 08/2009)

FUNDING

Research projects

- Principal investigator of the project “Bayesian nonparametrics for complex data”; grant: *STARS: Supporting Talent in Research*; grantor: Università degli Studi di Padova (2018-2019)
- Principal investigator of the project “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 the project “Modern Bayesian nonparametric methods”; grant: *PRIN2015: Progetto di Rilevanza Nazionale*; grantor: Italian Ministry of Education, Universities, and Research (2016-2018)
- Co-investigator of the project “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 the project “Statistical models for customer attrition in no profit organizations”, funder Moxoff S.p.A. (2014).
- Scientific coordinator of the project “Price forecast models and supply and demand curves models in Italian natural gas market”, funder Moxoff S.p.A., customer: Oil-and-gas company (2013).

Editorial Activity

- *Associate Editor*

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

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

- *Referee for* (in alphabetical order): [Annals of Applied Statistics](#), [Bayesian Analysis](#), [Biometrical journal](#), [Biometrika](#), [Computational Statistics and Data Analysis](#), [Electronic Journal of Statistics](#), [International Journal of Forecasting](#), [Journal of Applied Statistics](#), [Journal of Multivariate Analysis](#), [Journal of the American Statistical Association](#), [Journal of Business and Economic Statistics](#), [Journal of the Korean Statistical Society](#), [Journal of the Royal Statistical Society \(Series B\)](#), [Sankhyā](#), [Statistical Methods and Applications](#), [Statistics and Computing](#);
- *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

- Joint Organizer of the organized session [Bayesian Modelling and Computation](#) of the [11th international conference of the ERCIM WG on Computational and Methodological Statistics](#), 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](#), Turin, 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);

Local administrative duties



[Università degli Studi di Padova, Department of Statistical Sciences](#)

- Seminars coordinator (2018-now)
- Member of the executive council (*Giunta di Dipartimento*) (2018-now)
- Stage and placement committee (2017-now)


[Università degli Studi di Torino, M.Sc. in Stochastics and Data Science](#)

- Internship and orientation committee, (2015-2016)

TEACHING

( for courses taught in English,  for courses taught in Italian)

Università degli Studi di Padova


Master's degree in Statistics 

- Advanced statistics (*Statistica corso progredito*) (AAYY 18/19)
- Statistics: case studies (*Statistica Iterazione*) (AAYY 16/17)


Bachelor in Statistics 

- Statistics 2 (*Statistica 2*) (AAYY 17/18)
- Statistical methods for big data (*Metodi Statistici per big data*) (AAYY 16/17)
- Business Statistics (*Statistica aziendale*) (teaching assistant AAYY 11/12)


Università degli Studi di Torino

Master's degree in Stochastics and Data Science 

- Statistical Inference (AAYY 15/16);
- Statistical Machine Learning (AAYY 16/17);
- Bayesian Nonparametric Statistics (AAYY 16/17);

Master's degree in Quantitative Finance and Insurance 

- Statistics 2 (AAYY 13/14, 14/15);






Bachelor's degree in Management 

- Statistics 1 [*Statistica* (AAYY 12/13); *Matematica e Statistica* (AAYY 13/14); *Statistica per l'azienda* (AAYY 14/15, 15/16)]

Bachelor's degree in Economics 

- Statistics 1 (AAYY 15/16);

Business Schools, Summer Schools & Short courses

- BioStat, Asti Summer School in Applied Statistics, *Statistical Learning* (June, 2016) 
- CUOA Business School, Master in Business Administration and Master in Banking and Finance, *Quantitative methods for business* (March – November, 2009) 
- Short courses for private companies
 - Valueteam s.p.a. *Statistical Learning* (December, 2011) 
 - Assicurazioni Generali *Statistical Learning* (December 2016, January 2018, January 2019) 
 - Assicurazioni Generali *Segmentation and customer profiling* (January 2017, March 2018, February 2019) 

PUBLICATIONS

Publications in refereed journals

21. Durante, D., Canale, A., Rigon, T. (2018+), [A nested expectation-maximization algorithm for latent class models with covariates](#), *Statistics and Probability letters*, to appear, doi:10.1016/j.spl.2018.10.015
20. Rossini, J., Canale, A., (2018+), [Quantifying prediction uncertainty for functional-and-scalar to functional autoregressive models under shape constraints](#), *Journal of Multivariate Analysis*, to appear, doi:10.1016/j.jmva.2018.10.007
19. Canale, A., Durante, D., Dunson, D. (2018+), [Convex Mixture Regression for Quantitative Risk Assessment](#), *Biometrics*, to appear, doi:10.1111/biom.12917
18. Carmona, C., Nieto-Barajas, L., Canale, A. (2018+), [Model-based approach for household clustering with mixed scale variables](#), *Advances in Data Analysis and Classification*, to appear, doi:10.1007/s11634-018-0313-6

17. 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
16. Canale, A., (2017), [msBP: An R package to perform Bayesian nonparametric inference using multiscale Bernstein Polynomials mixtures](#), *Journal of Statistical Software*, 78, 6
15. Canale, A., Prünster, I., (2017), [Robustifying Bayesian nonparametric mixtures for count data](#), *Biometrics*, 73, 174–184
14. Canale, A., De Blasi, P., (2017), [Posterior asymptotics of nonparametric location-scale mixtures for multivariate density estimation](#), *Bernoulli Journal*, 23, 379–404
13. Canale, A., Ruggiero, M., (2016), [Bayesian nonparametric forecasting of monotonic functional time series](#), *Electronic Journal of Statistics*, 10, 3265–3286
12. Canale, A., Vantini, S., (2016), [Constrained Functional Time Series: Applications to the Italian Gas Market](#), *International Journal of Forecasting*, 32, 1340–1351
11. 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
10. Bandyopadhyay D., Canale, A., (2016), [Nonparametric spatial ordinal models for clustered periodontal data](#), *Journal of the Royal Statistical Society-Series C*, 65, 619–640.
9. 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
8. Canale, A., Dunson, D. B., (2016), [Multiscale Bernstein polynomials for densities](#), *Statistica Sinica*, 26, 3, 1175–1195
7. Bisaglia, L., Canale, A., (2016), [Bayesian nonparametric forecasting for INAR models](#), *Computational Statistics and Data Analysis*, 100, 70–78.
6. Canale, A., Scarpa, B., (2016), [Bayesian nonparametric location-scale-shape mixtures](#), *Test*, 25, 1, 113–130.
5. Canale, A., Dunson, D. B., (2015), [Bayesian multivariate mixed-scale density estimation](#), *Statistics and Its Interface*, 8, 2, 195–201.
4. Canale, A., (2015), [A note on regions of given probability for the extended skew-normal distribution](#), *Communications in Statistics*, 44, 2507–2516
3. Canale, A., Dunson, D. B., (2013), [Nonparametric Bayes modelling of count processes](#), *Biometrika*, 100, 4, 801–816
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

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., Prienster 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

National conference proceedings (with peer-review)

- Canale A., Vantini, S., (2016), Daily Prediction of Demand and Supply Curves, in *XLVIII Riunione Scientifica SIS*
- Bandyopadhyay D., Canale, A., (2014), Bayesian nonparametric spatial modelling of ordinal periodontal data, in *XLVII Riunione Scientifica SIS*.
- Canale, A., Scarpa, B., (2014), Skew-normal nonparametric mixture models, in *XLVII Riunione Scientifica SIS*.
- Canale, A., Vantini, S., (2013), Analysis of demand and supply curves in the Italian natural gas market through functional time series, in *Complex Models and Computational Intensive Methods for Estimation and Prediction*.
- Canale, A., Dunson, D.B., (2013), A Bayesian nonparametric model for data on different scales of measure; an application to customer base management of telecommunications companies, in *Advances in Latent Variables*.
- Canale, A., Dunson, D.B., (2012), A Bayesian nonparametric model for count functional data, in *XLVI Riunione Scientifica SIS*.

Other publications

- Canale A., (2012), [Bayesian nonparametric models for count data with applications to customer base management](#), *PhD Thesis*, Department of Statistical Sciences, University of Padua
- Canale A., (2008), [Aspetti statistici nella normale asimmetrica estesa](#) (in Italian), *Master Thesis*, Department of Statistical Sciences, University of Padua

Software

- Canale, A., (2017), [msBP: Multiscale Bernstein Polynomials for Densities](#), *R package, version 1.3*,
- 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*,

Updated November 14, 2018