Antonio Canale

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, 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)

- *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

- TBA; *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

- 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 estimantion; *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 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 "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., customer: Oil-and-gas company (2013).

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 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, 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);

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

22. 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

21. Rossini, J., Canale, A., (2019), Quantifying prediction uncertainty for functional-and-scalar to functional autoregressive models under shape constraints, *Journal of Multivariate Analysis*, 170.

20. Kon Kam King, G., Canale, A., & Ruggiero, M. (2018+), Bayesian functional forecasting with locally-autoregressive dependent process, *Bayesian Analysis*, to appear, doi10.1214/18-BA1140

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., 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

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 Padova

- Canale A., (2008), Aspetti statistici nella normale asimmetrica estesa (in Italian), *Master Thesis*, Department of Statistical Sciences, University of Padova

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*,