

Aldo Gardini

Curriculum Vitae

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Current Position

Dec. 2021 - **Junior Assistant Professor** at the Department of Statistical Sciences “P. Fortunati”, University of Bologna (Rimini Campus).

Education

2016-2020 **PhD in Statistical Sciences**, *Department of Statistical Sciences “P. Fortunati”*, University of Bologna (XXXII cycle). Scholarship winner. Title of the thesis: *“Bayesian inference for quantiles and conditional means in log-normal models”*. Academic tutor: Prof. C. Trivisano.

2014–2016 **MSc in Statistical Sciences**, *School of Economics, Management and Statistics*, University of Bologna. Title of the thesis: *“Analisi dei valori estremi dell’inquinamento da materia particolata a Bologna”*. Tutor: Prof. C. Trivisano. Co-tutor: Dr F. Scotto. Grade: 110/110 cum Laude.

2014 **BSc with Honours in Statistics**, *Department of Mathematics & Statistics*, University of Glasgow (Double-degree programme). Title of the thesis: *“Lake response to environmental change”*. Supervisor: Dr. C. Miller. Honours of the First Class.

2011–2014 **BSc in Statistical Sciences**, *School of Economics, Management and Statistics*, University of Bologna. Grade: 110/110 cum Laude.

2006-2011 **High school leaving qualification in scientific studies**, *“A. Righi” Lyceum*, Bologna.

Past Research Activities

Oct. 2021 - **Research Fellow** at the Department of Statistical Sciences “P. Fortunati”, University of Bologna. Project title: *“Prior distributions for latent Gaussian models”*. Tutor: Prof. C. Trivisano.

Oct. 2019-
Sept. 2021 **Research Fellow** at the Department of Statistical Sciences “P. Fortunati”, University of Bologna. Project title: *“The Mellin transform in statistics: quadratic forms distribution and prior specification”*. Tutor: Prof. C. Trivisano.

Research interests

The main research topic concerns the problem of specifying the prior distribution for scale parameters in Bayesian hierarchical models. From a methodological point of view, the following themes are faced:

- The specification of prior distributions for variance components in log-normal mixed models. Their specification is strictly connected to the existence of posterior moments of the conditional mean and other important quantities.
- The elicitation of priors for scale parameters in latent Gaussian models when structured random effects are involved.

The studied statistical methodologies are used in several applied problems:

- Estimation of poverty and inequalities through small area estimation models. Both the unit-level and the area level frameworks are faced. Recently, particular attention is devoted to the development of models for indices and proportions (family of beta regression models).
- Environmental epidemiology models, namely Besag-York-Mollie models to describe spatial and spatio-temporal phenomena.
- Analysis of sport data with the application of Bayesian hierarchical models for count data, focusing on the problem of variable selection.

Eventually, several collaborations for the analysis of data in applied fields, such as food microbiology, sociology, veterinary medicine and medicine are ongoing.

Academic Teaching Activities

As Adjunct Professor

- 2020-21 **Statistical Inference** in the *BSc Finance, Insurance and Business*, Department of Statistical Sciences "P. Fortunati", University of Bologna (5 CFU, 40 hours of lecture, SSD: SECS-S/01, Teaching language: Italian).
- 2020-21 **Statistics** in the *Combined BSc and MSc in Veterinary Medicine*, Department of Veterinary Medical Sciences, University of Bologna (2 CFU, 33 hours of lecture, SSD: SECS-S/02, Teaching language: Italian)

As Teaching Tutor

- 2021-22 **Bayesian Inference**, MSc in Statistical Sciences, Department of Statistical Sciences "P. Fortunati", University of Bologna (15 hours, SSD: SECS-S/01, Teaching language: English, Teacher: Prof. D. Cocchi).
- 2020-22 **Inference**, BSc in Statistical Sciences, Department of Statistical Sciences "P. Fortunati", University of Bologna (10 hours, SSD: SECS-S/01, Teaching language: English, Teacher: Prof. S. Cagnone).
- 2019-21 **Bayesian Inference**, MSc in Statistical Sciences, Department of Statistical Sciences "P. Fortunati", University of Bologna (20 hours, SSD: SECS-S/01, Teaching language: English, Teacher: Prof. D. Cocchi).

- 2019-20 **Statistics and Advanced Statistics**, *BSc Finance, Insurance and Business* and *MSc Statistical, Financial and Actuarial Sciences*, Department of Statistical Sciences "P. Fortunati", University of Bologna (38 hours, SSD: SECS-S/01, Teaching language: Italian, Teacher: Prof. C. Trivisano).
- 2018-19 **Bayesian Inference**, MSc in Statistical Sciences, Department of Statistical Sciences "P. Fortunati", University of Bologna (10 hours, SSD: SECS-S/01, Teaching language: English, Teacher: Prof. D. Cocchi).
- 2018-19 **Survey Sampling**, MSc in Statistical Sciences, Department of Statistical Sciences "P. Fortunati", University of Bologna (10 hours, SSD: SECS-S/01, Teaching language: English, Teacher: Prof. D. Cocchi).
- 2018-19 **Statistics and Advanced Statistics**, *BSc Finance, Insurance and Business* and *MSc Statistical, Financial and Actuarial Sciences*, Department of Statistical Sciences "P. Fortunati", University of Bologna (40 hours, SSD: SECS-S/01, Teaching language: Italian, Teacher: Prof. C. Trivisano).
- 2017-18 **Bayesian Inference**, MSc in Statistical Sciences, School of Economics, Management and Statistics, University of Bologna (10 hours, SSD: SECS-S/01, Teaching language: Italian, Teacher: Prof. D. Cocchi).
- 2017-18 **Principles and Methods of Survey Sampling**, MSc in Statistics, Economics and Business, School of Economics, Management and Statistics, University of Bologna (10 hours, SSD: SECS-S/01, Teaching language: Italian, Teacher: Prof. D. Cocchi).
- 2017-18 **Elements of Statistics**, BSc in International Development and Cooperation, School of Political Sciences, University of Bologna (20 hours, SSD: SECS-S/01, Teaching language: Italian, Teacher: Prof. L. Anderlucci).
- 2016-18 **Mathematics II**, BSc in Statistical Sciences, School of Economics, Management and Statistics, University of Bologna (10 hours, SSD: MAT/02, Teaching language: English, Teacher: Prof. A. Brini).

Co-supervisor of 3 Thesis of students from the MSc in Statistical Sciences.

Other Teaching Activities

- 2021 **Teacher** at the *Mountain Development 2021* summer school entitled "*I boschi demaniali dell'alto Appennino e il sequestro di C nel suolo, approfondimenti statistici e cartografici (GIS e R)*" and included in the project "*Alta Formazione e Innovazione per lo Sviluppo Sostenibile dell'Appennino - AL.FO.N.S.A.*" (16 hours).
- 2020 **Series of Seminars** with title *Introduction to R* for the students of the MSc Statistical, Financial and Actuarial Sciences (16 hours).
- 2020 **Teacher** at the *Mountain Development 2020* summer school entitled "*I Suoli dell'Appennino e Sequestro di Carbonio: casi di studio utilizzando R e GIS*" and included in the project "*Alta Formazione e Innovazione per lo Sviluppo Sostenibile dell'Appennino - AL.FO.N.S.A.*" (8 hours).
- 2019 **Teacher** at the "*Analysis of environmental data with R*" summer school organized by SIPE. (8 hours)
- 2019 **Teacher** at the "*Course of R*" vocational training organized by *ARPAE Emilia-Romagna*. (25 hours)

- 2018 **Teacher** at the “Course of R” vocational training organized by ARPAE Emilia-Romagna. (25 hours)
- 2015-2016 **Teaching Tutor** within “Scientific Degrees Plan (PLS)” (cycle of lectures in High Schools).

Participation to Research Groups

- 2020 Member of the Bologna Research Unit for the project PRIN 2015 (project no. 20154X8K23). Research project: EPHASTAT - Environmental processes and human activities: capturing their interactions via statistical methods. Principal Investigator: Prof. D. Cocchi.

Talks in Conferences and Workshops as Speaker

- 2022 **A. Gardini**. *Bayesian inference for mixed models with log-transformed response*. IMPS 2022 Symposium: Statistical methods for the analysis of complex data structures (**Invited**). Bologna, July 11-15, 2022.
- 2022 S. De Nicolò, **A. Gardini**. *The R Package tipsae: Tools for Mapping Proportions and Indicators on the Unit Interval*. SAE 2022: Small Area Estimation, Surveys and Data Science - Contributed session. College Park, May 23-27, 2022.
- 2021 E. Fabrizi, **A. Gardini**, C. Trivisano. *Bayesian inference for quantiles of a log-normal variable in presence of censored observations*. Workshop “Extremes”, organized by the *International Biometric Society, German Region* - Contributed session. Hannover, December 2nd - December 3rd, 2021.
- 2021 **A. Gardini**, F. Greco. *Metodi statistici per la valutazione della convergenza spaziale di indicatori SDGs*. 14^a Conferenza Nazionale di Statistica - **Invited session**. November 30th - December 1st, 2021.
- 2021 E. Fabrizi, **A. Gardini**, C. Trivisano. *Unit level models on the log-scale: a new Bayesian proposal for poverty mapping* SAE 2021 - **Invited session**. Naples, September 20-24, 2021.
- 2021 **A. Gardini**, E. Fabrizi, C. Trivisano. *Bayesian small area models with log-transformed response*. GRASPA 2021 - **Invited session**. Rome, 7-9 Giugno 2021.
- 2019 **A. Gardini**, F. Greco, C. Trivisano. *An R-based widget for Bayesian disease mapping*. GRASPA 2019 - **Invited session**. Pescara, 15-16 Luglio 2019.
- 2019 **A. Gardini**, C. Trivisano, E. Fabrizi. *Hierarchical Bayes estimation of unit-level small area log-normal models*. ITACOSM 2019 - Contributed session. Firenze, 5-7 Giugno 2019.
- 2018 **A. Gardini**, C. Trivisano, E. Fabrizi. *Bayesian inference for log-normal quantiles*. EphaStat Project Intermediate Meeting. **Invited session**. Bari, 6-7 Settembre 2018.

Talks in Conferences and Workshops as Co-author

- 2022 S. De Nicolò, **A. Gardini**. *Mapping Indicators on the Unit Interval: the tipsae Shiny App*. SIS 2022: 51st Scientific Meeting of the Italian Statistical Society - Contributed session. Caserta, June 22-24, 2022.

- 2022 E. Fabrizi, S. De Nicolò, **A. Gardini**. *Inflated beta models for poverty mapping. An application integrating survey and remote sensing data*. SAE 2022: Small Area Estimation, Surveys and Data Science - **Invited session**. College Park, May 23-27, 2022.
- 2022 S. De Nicolò, E. Fabrizi, **A. Gardini**. *Bayesian methods for poverty mapping: an application integrating survey and remote sensing data*. 58th Conference of Statisticians, Econometricians, and Mathematicians from Southern Poland.
- 2019 M. Contel, **A. Gardini**, N. De Luigi, V. Quaglietti, A. Scorcu, S. Zucconi. *Investigating Drinking Profiles among Italian High School Students (14-19 y.o.): a Latent Class Analysis*. KBS 2019 - 45th Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society. Utrecht, 3-7 giugno 2019.

Publications in Statistical area

- 2022 **A. Gardini**, E. Fabrizi, C. Trivisano. Poverty and inequality mapping based on a unit-level log-normal mixture model. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*.
DOI: <https://doi.org/10.1111/rssa.12872>
- 2022 **A. Gardini**, F. Greco, C. Trivisano. The Mellin transform to manage quadratic forms in normal random variables. *Journal of Computational and Graphical Statistics*.
DOI: <https://doi.org/10.1080/10618600.2022.2034639>
- 2021 **A. Gardini**, C. Trivisano, E. Fabrizi. Bayesian Analysis of ANOVA and Mixed Models on the Log-Transformed Response Variable. *Psychometrika* 86, 619–641.
DOI: <https://doi.org/10.1007/s11336-021-09769-y>
- 2021 R. Ievoli, **A. Gardini**, L. Palazzo. The role of passing network indicators in modeling football outcomes: an application using Bayesian hierarchical models. *AStA Advances in Statistical Analysis*.
DOI: <https://doi.org/10.1007/s10182-021-00411-x>
- 2020 **A. Gardini**, C. Trivisano, E. Fabrizi. Bayesian inference for quantiles of the log-normal distribution. *Biometrical Journal*, 62(8), 1997-2012.
DOI: <https://doi.org/10.1002/bimj.201900386>
- 2020 **A. Gardini**. Bayesian inference for quantiles and conditional means in log-normal models. *PhD Dissertation Thesis*.
DOI: <https://doi.org/10.6092/unibo/amsdottorato/9349>

Publications in other fields

- 2021 Bassi, I., Guerrieri, A., Carpano, M., **Gardini, A.**, Prediletto, I., Polastri, M., Randall Curtis, J., Nava, S. Feasibility and efficacy of a multidisciplinary palliative approach in patients with advanced interstitial lung disease. A pilot randomised controlled trial. *Pulmonology*.
DOI: <https://doi.org/10.1016/j.pulmoe.2021.11.004>

- 2021 Veronesi, G., Guglielmo, A., **Gardini, A.**, Sacchelli, L., Loi, C., Patrizi, A., Bardazzi, F. Biological therapy in patients with psoriasis: What we know about the effects on renal function. *Dermatologic Therapy*.
DOI: <https://doi.org/10.1111/dth.15202>
- 2020 M. Contel, **A. Gardini**, N. De Luigi, V. Quaglietti, A. Scorcu, S. Zucconi. Investigating Drinking Profiles among Italian High School Students (14-19 y.o.): a Latent Class Analysis. *Salute & Società*, 133-148.
DOI: <https://doi.org/10.3280/SES2020-003009>
- 2020 Veronesi G., Ravaioli G.M., Lambertini M., Zannetti G., Diodato S., **Gardini A.**, Patrizi A., Fanti S., Dika E. Considerations on 18FDG PET/CT and sentinel lymph node biopsy in AJCC stages I and II of melanoma. *Giornale Italiano di Dermatologia e Venereologia*, 155(6):784-6.
DOI: <https://doi.org/10.23736/S0392-0488.18.06108-4>
- 2019 Montanari, C., Tabanelli, G., Zamagna, I., Barbieri, F., **Gardini, A.**, Ponzetto, M., Redaelli, E., Gardini, F. Modeling of yeast thermal resistance and optimization of the pasteurization treatment applied to soft drinks. *International journal of food microbiology*, 301, 1-8.
DOI: <https://doi.org/10.1016/j.ijfoodmicro.2019.04.006>
- 2017 Tabanelli, G., Montanari, C., **Gardini, A.**, Maffei, M., Prioli, C., Gardini, F. Environmental Factors Affecting Escherichia coli Concentrations in Striped Venus Clam (*Chamelea gallina* L.) Harvested in the North Adriatic Sea. *Journal of Food Protection*, 80(9), 1429-1435.
DOI: <https://doi.org/10.4315/0362-028X.JFP-17-058>
- 2016 C. Montanari, E. Bargossi, **A. Gardini**, R. Lanciotti, R. Magnani, F. Gardini, G. Tabanelli. Correlation between volatile profiles of Italian fermented sausages and their size and starter culture. *Food Chemistry* 192, pp. 736 - 744.
DOI: <https://doi.org/10.1016/j.foodchem.2015.07.062>
- 2016 G. Tabanelli, E. Bargossi, **A. Gardini**, R. Lanciotti, R. Magnani, F. Gardini, C. Montanari. Physico-chemical and microbiological characterisation of Italian fermented sausages in relation to their size. *Journal of the Science of Food and Agriculture*, 96(8), 2773-2781.
DOI: <https://doi.org/10.1002/jsfa.7442>

Contributions in Proceedings

- 2022 S. De Nicolò, **A. Gardini**. Mapping Indicators on the Unit Interval: the tipsae Shiny App, in Balzanella, A., Bini, M., Cavicchia, C., Verde, R. *Book of short papers - SIS 2022*, Pearson, pp. 881-886 (ISBN).
- 2021 **A. Gardini**, E. Fabrizi, C. Trivisano. Bayesian small area models with log-transformed response. *Proceedings of the GRASPA 2021 Conference (Rome, 07-09 June 2021)*, pp. 57 - 60. ISBN: 9791220084963
- 2020 **A. Gardini**, F. Greco, C. Trivisano. Priors on precision parameters of IGRMF models. *Book of Short Papers SIS 2020*, Pearson, 2020, pp. 459 - 464. ISBN: 9788891910776

- 2019 **A. Gardini**, F. Greco, C. Trivisano. An R-based widget for Bayesian disease mapping. *Proceedings of the GRASPA 2019 Conference (Pescara, 15-16 July 2019)*, p. 53. ISBN: 9788897413349

Submitted Papers

S. De Nicolò, **A. Gardini**. The R Package `tipsae`: Tools for Mapping Proportions and Indicators on the Unit Interval

S. De Nicolò, E. Fabrizi, **A. Gardini**. Extended Beta models for poverty mapping. An application integrating survey and remote sensing data in Bangladesh

Software

- 2022 S. De Nicolò, **A. Gardini**. `tipsae`: Tools for Handling Indices and Proportions in Small Area Estimation. *R package version 0.0.7*. <https://CRAN.R-project.org/package=tipsae>
- 2021 **A. Gardini**, F. Greco e C. Trivisano. `QF`: Density, Cumulative and Quantile Functions of Quadratic Forms. *R package version 0.0.6*. <https://CRAN.R-project.org/package=QF>
- 2020 **A. Gardini**, E. Fabrizi e C. Trivisano. `BayesLN`: Bayesian Inference for Log-Normal Data. *R package version 0.2.2*. <https://CRAN.R-project.org/package=BayesLN>

Institutional Activities

- Nov. 2020 - Elected research fellows representative in the Department Council. Department of
Dec. 2021 Statistical Sciences "P. Fortunati", University of Bologna
- Apr. 2018 - Elected PhD Students representative in the PhD Board. Department of Statistical
Apr.2020 Sciences "P. Fortunati", University of Bologna

Professional Assignments

- Mar. 2020 **Collaboration** for the planning of a survey for the teaching tutors (Department of Statistical Sciences "P. Fortunati", University of Bologna).
- 2018-20 **External consultant** for *Nomisma S.p.A.* in data analysis activities.
- 2015 **Curricular internship** in *Arpa Emilia-Romagna* (250 hours).
- 2014-2016 **Degree programme tutor** for the BSc in Statistical Sciences, School of Economics, Management and Statistics, University of Bologna.

Other Informations

- Award Merit Award, University of Bologna, a.y. 2012/2013.
- Infomatic Office package, C++.
skills **Statistic softwares and languages**: R (package developer), BUGS, Stan, SAS, SPSS.
Writing languages: \LaTeX and beamer.
- Linguistic **English**: good knowledge (B2 level)
skills

Patent B

Il sottoscritto autorizza al trattamento dei dati personali, in conformità alle disposizioni della legge sulla privacy (D.L.196/03).

Bologna, 23 agosto 2022