

# Andrea Gilardi | Curriculum Vitae

– Milan, Italy

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## Summary

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I am an Assistant Professor (Ricercatore SECS-S/01, Legge 240/10 tipo A) at the [Department of Mathematics of Politecnico di Milano](#). I am a member of the [MOX](#) laboratory of mathematical modelling and scientific computing. My main research interests focus on spatial and spatiotemporal models for events on linear networks.

## Current Position

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### Politecnico di Milano

Assistant Professor (RTDA)

Milan, Italy

JUN. 23 - Today

I am working on a project named *GRINS: Growing Resilient, INclusive and Sustainable* which is part of the Next Generation EU program (National Recovery and Resilience Plan).

## Education

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### University of Milano - Bicocca

PhD in Statistics and Mathematical Finance

NOV.17–APR.21

### University of Milano - Bicocca

Master Degree in Statistics (LM-82)

SET.15–OTT.17

Final mark: 110/110 e lode (Magna cum laude)

### Università di Milano - Bicocca

Bachelor Degree in Statistics (L-41)

SET.12–SET.15

Final mark: 110/110 e lode (Magna cum laude)

## Teaching

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### Lecturer (Docente)

- *R for Data Science*, University of Milano - Bicocca, PhD in Economics, Management and Statistics, Curriculum Statistics, 12 hours, a.y. 2022-2023. [Materials](#).
- *Livellamento al Software R* (Introduction to the R Software), University of Milano - Bicocca, Master degree in Statistics and Economics, 14 hours, aa.yy. 2022-2023; 2023-2024.

### Teaching Assistant (Esercitatore)

- *Statistica II* (Statistics II), University of Milano - Bicocca, Bachelor degree in Statistical and Economic Sciences, 20 hours, aa.yy. 2017-2018; 2022-2023; 2023-2024.

### Tutor

- *Statistica II* (Statistics II), University of Milano - Bicocca, Bachelor degree in Statistical and Economic Sciences, 40 hours per year, aa. yy. 2018-2019; 2019-2020; 2020-2021; 2021-2022.
- *Lab Data Challenges*, University of Milano - Bicocca, Master degree in Statistics and Economics, 20 hours, a.y. 2020-2021.
- *R for Road Safety*, RAC Foundation, 12 hours, Oct. 2019, [Program](#) and [Materials](#).
- *Introduction to R*, University of Milano - Bicocca, Bbetween 2019 MULTIMEDIA, 20 hours, a.y. 2018-2019, [Materials](#).
- *Introduction to tidyverse and plumber*, University of Turin - Master in Data Science, 4 hours, Oct. 2018.
- *Statistica Economica M* (Economic Statistics), University of Milano - Bicocca, Master degree in Statistics and Economics, 20 hours, a.y. 2017-2018.
- *Informatica* (Informatics), University of Milano - Bicocca, Bachelor degree in Statistical and Economic Sciences, 20 hours, a.y. 2016-2017.

## Working Experience

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### University of Milano - Bicocca

Research fellow (*Assegnista di Ricerca*)

I worked on a project entitled "Spatio-temporal models for spatial network data" under the supervision of Prof. [Riccardo Borgoni](#).

Milan, Italy

JAN. 21 - JUN. 23

### Catholic University of the Sacred Heart

Tutor

I worked on a project named *Black Box and Big Data per la stima e la previsione dei sinistri* under the supervision of Prof. [Diego Zappa](#).

Milan (Italy)

OCT.20–NOV.20

### University of Milano - Bicocca

Tutor

I prepared and organized the admission tests for the master degree in Statistics and Economics, Department of Economics, Management and Statistics.

Milan (Italy)

JUN.20–OCT.20 & JUN.21 – OCT.21 & JUN.22 – OCT.22 & JUN.23–OCT.23

### GR & Partner S.A.S

Consultant

I developed a User Interface using R and Shiny.

Milan (Italy)

APR.18–OCT.18

## PhD Thesis

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**Title:** *Statistical Models and Data Structures for Spatial Data on Road Networks*

**Supervisor:** Prof. Riccardo Borgoni and Prof. Jorge Mateu

**Summary:** The thesis introduces data structures, vital pre-processing steps, and statistical models to analyse spatial data lying on road networks using point-pattern and network-lattice approaches.

## Master Degree Thesis

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**Title:** *Previsione spaziotemporale per gli interventi in emergenza delle ambulanze nel comune di Milano*

**Supervisor:** Prof. Riccardo Borgoni

**Summary:** We developed a spatiotemporal model to predict the distribution of the emergency medical interventions in Milan.

## Visiting Periods

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- I spent seven months in Castellón de la Plana (ES), from February 2020 to June 2020 and May 2021 to July 2021, working with Prof. [Jorge Mateu](#) on statistical models for events on road networks.
- I stayed in Leeds (UK) for three months, from September 2019 to November 2019, working with Prof. [Robin Lovelace](#) on R packages and classes for road networks. [Final presentation](#).

## Publications

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1. **Gilardi, A.**, Lovelace, R., Padgham, M., Data structures and methods for reproducible street network analysis: overview and implementations in R. Under review. [Preprint](#);
2. **Gilardi, A.**, Borgoni, R., Mateu, J., A non-separable first-order spatio-temporal intensity for events on linear networks: an application to ambulance interventions. (2023+) Accepted for publication in *Annals of Applied Statistics*. [Preprint](#);
3. **Gilardi, A.**, Borgoni, R., The impact of traffic flow and road signs on road accidents: an approach based on spatiotemporal point pattern analysis on linear networks. In: Book of the Short Papers - SIS 2023 (pp. 702-707), Pearson, ISBN: 9788891935618AAVV, Ancona (IT). [Link](#);
4. **Gilardi, A.**, Borgoni, R., Presicce, L., Mateu, J. (2023) Measurement Error Models for Spatial Network Lattice Data: Analysis of car crashes in Leeds. *Journal of the Royal Statistical Society: Series A (Statistics in Society)* Volume 186, Issue 3, July 2023, Pages 313–334, <https://doi.org/10.1093/jrsss/qnad057>;
5. **Gilardi, A.**, Borgoni, R., Mateu, J. (2022). Geographically weighted regression for spatial network data: an application to traffic volumes estimation. In 51th Scientific Meeting of the Italian Statistical Society (pp. 1504 - 1509). Torino:Pearson Italia. ISBN: 9788891932310, Caserta (IT). [Link](#).

6. **Gilardi, A.**, Borgoni, R., Mateu, J. (2022). Spatial statistical calibration on linear networks: an application to the analysis of traffic volumes. In Proceedings of the 10th International Workshop on Spatio-Temporal Modelling, Lleida (Spain), 1-3 June 2022. ISBN 978-84-9144-364-3. [http://doi.org/10.21001/METMA\\_X](http://doi.org/10.21001/METMA_X).
7. Borgoni, R., **Gilardi, A.**, Zappa, D. (2022). Optimal Subgrids from Spatial Monitoring Networks. In: (a cura di): Lombardo R; Camminatiello I; Simonacci V, IES 2022 Innovation & Society 5.0: Statistical and Economic Methodologies for Quality Assessment - Book of Short Papers. p. 148-152, Sesto San Giovanni:Professional Knowledge Empowerment, ISBN: 978-88-94593-35-8, Capua, 2022. [Link](#).
8. **Gilardi, A.**, Mateu, J., Borgoni, R., Lovelace, R. (2022) Multivariate hierarchical analysis of car crashes data considering a spatial network lattice. *Journal of the Royal Statistical Society: Series A (Statistics in Society)* Volume 185, Issue 3, July 2022, Pages 1150–1177, <http://doi.org/10.1111/rssa.12823>;
9. **Gilardi, A.**, Borgoni, R., Presicce, L., Mateu, J. (2021) Measurement error models on spatial network lattices: car crashes in Leeds. In 13th Scientific Meeting of the Classification and Data Analysis Group, Firenze, September 9-11, 2021. <https://doi.org/10.36253/978-88-5518-340-6>;
10. **Gilardi, A.**, Borgoni, R., Mateu, J. (2021). A spatio-temporal model for events on road networks: an application to ambulance interventions in Milan. In 50th Scientific Meeting of the Italian Statistical Society (pp. 702 - 707). Torino:Pearson Italia. ISBN: 9788891927361, Pisa - Virtual. [Link](#);
11. Borgoni, R., **Gilardi, A.**, Zappa, D. (2020). Assessing the Risk of Car Crashes in Road Networks. *Social Indicators Research*, 1-19. <https://doi.org/10.1007/s11205-020-02295-x>;
12. Borgoni, R., **Gilardi, A.**, Zappa, D. (2020). Spatial modelling of driver crash risk using georeferenced data. In NESPUTT 2019 - New Economic & Statistical Perspectives on Urban & Territorial Themes. (NESPUTT 2019). E-book. vol. libreriauniversitaria, ISBN: 9788833592091, University of Milan - Bicocca, 2019. [Link](#);
13. **Gilardi, A.**, Borgoni, R., Zappa, D. (2020). Assessing the Risk of Car Accidents in Road Networks. In NESPUTT 2019 - New Economic & Statistical Perspectives on Urban & Territorial Themes. (NESPUTT 2019). E-book. vol. libreriauniversitaria, ISBN: 9788833592091, University of Milan - Bicocca, 2019. [Link](#);
14. **Gilardi, A.**, Borgoni, R., Zappa, D. (2019). Spatial Logistic Regression for Events Lying on a Network: Car Crashes in Milan. In: Book of Short Papers SIS2019. (pp. 1165-1170), Pearson, ISBN: 9788891915108, Milano, 2019. [Link](#);
15. **Gilardi, A.**, Borgoni, R., Pagliosa, A., Bonora, R. (2018). Spatiotemporal Prevision for Emergency Medical System Events in Milan. In: Book of short Papers SIS 2018 (pp. 1697-1702). ISBN: 9788891910233, Palermo, Italia, 2018. [Link](#).

## Summer Schools and Workshops

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- R Project Sprint 2023, University of Warwick (UK), August 30 - September 1, 2023. [Webpage](#).
- Contributing to R, Online workshop held during useR! 2021.
- Spatial Statistics for huge datasets and best practices, Online workshop held during useR! 2021.
- Tidyverse developer day, Tolouse (FR), July 2019. [Announcement](#).
- Robust Statistics : Foundations and Recent Developments, University of Milano-Bicocca, March 2019.
- CLADAG, Summer School on Clustering and Classification, University of Catania - May 2018.

## Conferences

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### Invited

- 2023 IMS International Conference on Statistics and Data Science (ICSDS), December 18-21, 2023, Lisbon, Portugal
- 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 17-19 December 2022) - King's College London.
- Summer Institute in Computational Social Science (SICSS-Covenant), 22-29 June 2022, Covenant University, Ogun State, Nigeria. Online Event.
- OpenGeoHub Summer School 2021, 1-3 September 2021, Online Event.

### Contributed

- Free and Open Source Software for Geospatial (FOSS4G), 22-28 August 2022, Florence (Italy).

- 51th meeting of the Italian Statistical Society, 22-24 June 2022, Caserta (Italy).
- METMA X, 10th International Workshop on Spatio-Temporal Modelling, 1-3 June 2022, Lleid (Spain)
- CLADAG 2021, 13th Scientific Meeting Classification and Data Analysis Group, 9-11 September 2021, Online.
- UseR! 2021 Meeting, 5-9 July 2021, Online.
- 50th meeting of the Italian Statistical Society, 21-25 June 2021, Online.
- OpenGeoHub 2020, 16-23 August 2020, Wageningen (Netherlands).
- Nesputt 2019: New Economic & Statistical Perspective, 21-22 November 2019, Milan (Italy).
- Meeting of the Italian Statistical Society, 18-21 June 2019, Milan (Italy).
- 49th Meeting of the Italian Statistical Society, 20-22 June 2018, Palermo (Italy).

### Attended

- GRASPA 2023, 10-11 July 2023, Palermo (Italy).
- Workshop Young Environmental Statistician (YES), February 3rd, 2023, University of Bologna (Italy).
- e-Rum 2020: European R User Meeting, 17-20 June 2020, Online event.
- UseR! 2019 Meeting, 9-12 July 2019, Tolouse (France).
- Stataalk, March 29th, 2019, University of Bologna (Italy).
- Stataalk, November 17th, 2017, University of Padova (Italy).

## Organized Conferences

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- I organized an online Webinar and Hackathon related to the R package [sfnetworks](#) as official satellite event of the e-Rum 2020 Conference. [Materials](#), [slides](#) and [recordings](#).
- I was a member of the Local Organizing Committee of [Nesputt 2019: New Economic & Statistical Perspective](#) conference, Milan (Italy).

## Grants

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- [Tidy Spatial Networks in R](#) funded by the [R Consortium](#). 9000\$. Joint project with Lucas van der Meer, [Lorena Abad](#), and [Robin Lovelace](#).

## Awards

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- Travel award to attend the [R Project Sprint 2023](#) event. 650£.
- Scholarship for the OpenGeoHub 2020 - Summer School. Project: *plotKML functionality to support sf and stars objects*. 800€. [Final presentation](#).
- [SIS](#) award for the best poster at the SIS-2019 conference.
- [Young-SIS](#) award for the best poster at the SIS-2018 conference.

## Community activities

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### Referee service

AStA Advances in Statistical Analysis; rOpenSci; Scientific Reports; Spatial Statistics; Statistical Methods & Applications; Technometrics.

### Affiliations

Institute of Mathematical Statistics (IMS); International Statistical Institute (ISI); rOpenSci; Società Italiana di Statistica (SIS).

### Projects and activities with public engagement

- Member of the group working on Progetto di Terza Missione entitled *Analisi della dislocazione spaziale e spaziotemporale degli interventi extraospedalieri e definizione di criteri per monitorare e dimensionare la flotta dei mezzi di soccorso*, University of Milano - Bicocca, 2023.

## Software

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I am a proficient R user, with a particular interest in the `r-spatial` world and the tidyverse environment. I am the author of two R packages, namely `osmextract` ([reviewed](#) by rOpenSci foundation and now on [CRAN](#)) and `sfnetworks` (also on [CRAN](#)). The first package focuses on the management and downloading of Open Street Map data extracts obtained from several providers (like [Geofabrik](#)), while the second package provides a tidy approach to spatial network analysis.

I contributed to several R packages like `ggplot2`, `recipes`, `sf`, `stplanr` and `osmdata`. I attended the [Tidyverse Developer Day](#) in Tolouse during the User! 2019 conference and I plan to attend the [R Project Sprint 2023](#) event at the University of Warwick (UK).

I can write scientific documents and presentations using  $\LaTeX$  and I have a basic knowledge of SQLite, GDAL, POSTGIS, SAS, Python, and STATA.

## Badges

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**SAS:** [SAS Certified Base Programmer for SAS 9](#)

**SAS:** [SAS Certified Predictive Modeler Using SAS Enterprise Miner 7](#)

## Additional Information

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**Associazioni:** Volunteer at Volontari del Soccorso di Calolziocorte from July 2016.

## Notes

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Autorizzo la pubblicazione ai sensi del D.Lgs. n. 33/2013 "Riordino della disciplina riguardante gli obblighi di pubblicità, trasparenza e diffusione di informazioni da parte delle pubbliche amministrazioni" e acconsento all'utilizzo delle informazioni ivi contenute ai sensi del D.L. n. 196/2003 "Codice in materia di protezione dei dati personali".

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000.