Beatrice Franzolini

Contact information

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Current positions

Jul 2023–Present	*Junior Assistant Professor (Italian RTD-A)*, Bocconi Institute for Data Science and Analytics - BIDSA, Bocconi University (Milan, Italy)
Feb 2020–Present	*Research Affiliate* (from Jul 2023: *Member of the core faculty*), Bayesian Learning Laboratory - BayesLab, Bocconi University (Milan, Italy)

Past academic positions

Jan 2022–Jul 2023	*Research Fellow*, Singapore Institute for Clinical Sciences - SICS Agency for Science, Technology and Research - A*STAR (Singapore, Republic of Singapore)
Jan 2022–Jul 2023	*Member*, Division of Biomedical Data Science, Yong Loo Lin School of Medicine National University of Singapore - NUS (Singapore, Republic of Singapore)

Education

Sep 2017 - Feb 2022	***PhD in Statistics**, Bocconi University* (Milan, Italy)	
	Advisors:	Antonio Lijoi, Igor Prünster
	Thesis:	On Dependent Processes in Bayesian Nonparametrics: Theory, Methods, and Applications.
	Final Mark:	with honors
Sep 2014 - Apr 2017	***Master of Science in Finance**, Bocconi University* (Milan, Italy)	
	Advisor:	Massimo Guidolin
	Thesis:	Can a Consumption-Based Stochastic Discount Factor Jointly Price the Cross-section of Commodity Futures Returns?
	Final Mark:	110/110 with honors
Sep 2011- Jul 2014	***Bachelor in Statistics**, University of Bologna* (Bologna, Italy)	
	Advisor:	Luca De Angelis
	Thesis:	Utility Functions for C-CAPM: an Empirical Analysis to Compare CRRA Functions with Epstein and Zin Function.
	Final Mark:	110/110 with honors

Publications

Preprints

1. Franzolini, B., De Iorio, M., and Eriksson, J.G. (2024+). Conditional partial exchangeability: a probabilistic framework for multi-view clustering. arXiv:2307.01152

2. Anceschi, N., Fasano, A., Franzolini, B., Rebaudo, G. (2024+). Scalable expectation propagation for generalized linear models. arXiv:2407.02128

Articles in refereed journals

3. Ascolani, F., Franzolini, B., Lijoi, A., and Prünster, I. (2024, in press). Nonparametric priors with full-range borrowing of information, *Biometrika*, 111(3), 945–969. `https://doi.org/10.1093/biomet/asad063`

4. [**Cross-Disciplinary**] Cremaschi, A., van den Boom, W., Ng, N.B.H., Franzolini, B., Tan, K.B., Yen, J.C.K., Tan, K.H., Chong, Y.-S., Eriksson, J.G., De Iorio, M. (2024, in press). Post-partum screening for type 2 diabetes in women with a history of gestational diabetes mellitus: A cost-effectiveness analysis in Singapore, *Value in Health Regional Issues*, forthcoming.

5. Franzolini, B., Beskos, A., De Iorio, M., Poklewski-Koziell, W. P., and Grzeszkiewicz, K. (2024). Change-point detection in dynamic Gaussian graphical models: the impact of COVID-19 pandemic on US stock market, *The Annals of Applied Statistics*, 18(1), 555-584. `https://doi.org/10.1214/23-AOAS1801`

6. Franzolini, B. and Rebaudo, G. (2024). Entropy regularization in probabilistic clustering, *Statistical Methods & Applications*, 33(1), 37–60. `https://doi.org/10.1007/s10260-023-00716-y`

7. Franzolini, B., Cremaschi, A., van den Boom, W., and De Iorio, M. (2023). Bayesian clustering of multiple zero-inflated outcomes, *Philosophical Transactions of the Royal Society A*, 381(2247), 1-16. `https://doi.org/10.1098/rsta.2022.0145`

8. Franzolini, B., Lijoi, A., and Prünster, I. (2023). Model selection for maternal hypertensive disorders with symmetric hierarchical Dirichlet processes, *The Annals of Applied Statistics*, 17(1), 313-332. `https://doi.org/10.1214/22-AOAS1628`

Refereed discussions

9. Rebaudo G., Fasano, A., Franzolini, B., and Müller, P. (2023). A discussion on: "Evaluating sensitivity to the stick-breaking prior in Bayesian nonparametrics" by Giordano, R., Liu, R., Jordan M. I. and Broderick T., *Bayesian Analysis*, 18(1), 287-366. `https://doi.org/10.1214/22-BA1309`

Refereed proceedings

10. Franzolini, B. (2024, in press). *How to leverage Bayesian mixtures for dynamic clustering and classification.* In Methodological and Applied Statistics and Demography I; II; III; IV: SIS 2024 (Editors: Pollice, A., Mariani, P.) ISBN 9783031643453

11. Bondi, L., Franzolini, B., and Palma, M. (2024, in press) *A longitudinal study of the gender gap in school grades via flexible Bayesian Beta regression.* In Methodological and Applied Statistics and Demography I; II; III; IV: SIS 2024 (Editors: Pollice, A., Mariani, P.) ISBN 9783031643453

12. Franzolini, B., Bondi, L., Fasano, A., and Rebaudo, G. (2023). *Bayesian forecasting of multivariate longitudinal zero-inflated counts: an application to civil conflict.* In Book of Short Papers CLADAG 2023, 465-468. (Editors: Corretto, P., Giordano G., La Rocca, M., Parrella, M. L., Rampichini, C.) ISBN 9788891935632

13. Fasano, A., Anceschi, N., Franzolini, B., and Rebaudo, G. (2023). *Efficient computation of predictive probabilities in probit models via expectation propagation.* In Book of Short Papers CLADAG 2023, 449-452. (Editors: Corretto, P., Giordano G., La Rocca, M., Parrella, M. L., Rampichini, C.) ISBN 9788891935632

14. Fasano, A., Anceschi, N., Franzolini, B., and Rebaudo, G. (2023). *Efficient expectation propagation for posterior approximation in high-dimensional probit models.* In Book of Short Papers SIS 2023, 1133-1138. (Editors: Chelli, F. M., Ciommi, M., Mariani, F., Recchioni, M. C.) ISBN 9788891935618

15. Franzolini, B. and Rebaudo, G. (2022). *A regularized-entropy estimator to enhance cluster interpretability in Bayesian nonparametrics.* In Book of Short Papers SIS 2022, 387-397. (Editors: Balzanella, A., Bini, M., Cavicchia, C. and Verde, R.). ISBN 9788891932310

16. Ascolani, F., Franzolini, B., Lijoi, A., and Prünster, I. (2021). *On the dependence structure in Bayesian nonparametric priors.* In Book of Short Papers SIS 2021 (Editors: Perna, C., Salvati, N. and Schirripa Spagnolo, F.). ISBN 9788891927361

Conference presentations and seminars

Invited talks and seminars

1. BIRS Workshop on Bayesian Uncertainty Quantification in Large Models, Chennai, India. Talk's title: *TBA.* (December 2025 - upcoming).

2. Seminar at the ISBA-BNP webinar series Talk's title: *TBA.* (February 2025 - upcoming).

3. Recent Developments in the Techniques of Bayesian Paradigm, Banaras Hindu University, Varanasi, India. Talk's title: *Hierarchically extended stochastic block models for multiplex networks.* (January 2025 - upcoming).

4. Frontiers of Bayesian Inference and Data Science workshop, BIRS-CMO Workshop, Oaxaca, Mexico. Talk's title: *Conditional partial exchangeability: longitudinal and multi-view partitions.* (September 2024).

5. 11th World Congress in Probability and Statistics - Bernoulli-IMS, Bochum, Germany. Talk's title: *Conditional partial exchangeability for multi-view clustering and network data.* (August 2024).

6. 3rd BNP Networking Workshop, Singapore, Republic of Singapore. Talk's title: *Hierarchically extended stochastic block models for multiplex networks.* (July-August 2024).

7. IMS Interpretable Inference via Principled BNP Approaches in Biomedical Research and Beyond - residential research program in Singapore, Singapore, Republic of Singapore. Talk's title: *Multivariate species sampling models for partially exchangeable data and beyond.* (July 2024).

8. 2024 World Meeting of the International Society for Bayesian Analysis (ISBA 2024), Venezia, Italy. Talk's title: *Conditional partial exchangeability: a probabilistic framework for longitudinal and multi-view clustering.* (July 2024).

9. International Symposium on Nonparametric Statistics 2024 (ISNPS 2024), Braga, Portugal. Talk's title: *Conditional partial exchangeability: a probabilistic framework for longitudinal and multi-view clustering.* (June 2024).

10. 52nd Meeting of the Italian Statistical Society (SIS 2024), Bari, Italy. Talk's title: *How to leverage Bayesian mixtures for dynamic clustering and classification.* (June 2024).

11. 4th Italian Meeting on Probability and Mathematical Statistics 2024, Rome, Italy. Talk's title: *Multivariate species sampling models.* (June 2024).

12. StaTalk2024@DiSIA UNIFI, Firenze, Italy. Talk's title: *How to leverage Bayesian mixtures for dynamic clustering and classification.* (May 2024).

13. Seminar at Department of Mathematics and Statistics, University of Bern. Seminar's title: *Rethinking dynamic and network data modeling: a probabilistic framework based on species sampling models.* (March 2024).

14. 16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2023), Berlin, Germany. Talk's title: *Multivariate species sampling models.* (December 2023).

15. 6th International Conference on Econometrics and Statistics (ECOSTA 2023), Tokyo, Japan. Talk's title: *Conditional partial exchangeability: A probabilistic framework for multi-view clustering.* (August 2023).

16. Approximation Methods in Bayesian Analysis @ CIRM, Marseille, France. Talk's title: *Geometry of scale mixtures.* (June 2023).

17. 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2022), London, UK. Talk's title: *Bayesian nonparametric multilayer clustering of longitudinal data.* (December 2022).

18. 2022 World Meeting of the International Society for Bayesian Analysis (ISBA 2022), Montreal, Canada. Talk's title: *Nonparametric priors with full-range borrowing of information.* (June 2022).

19. 51st Meeting of the Italian Statistical Society (SIS 2022), Caserta, Italy. Talk's title: *Entropy regularization in probabilistic clustering.* (June 2022).

20. 5th International Conference on Econometrics and Statistics (ECOSTA 2022), Kyoto, Japan. Talk's title: *Model selection for maternal hypertensive disorders with symmetric hierarchical Dirichlet processes.* (June 2022).

21. Foundations of Objective Bayesian Methodology Workshop, Oaxaca, Mexico. Talk's title: *Nonparametric priors with full-range borrowing of information.* (November 2021).

22. 4th International Conference on Econometrics and Statistics (ECOSTA 2021), ~~Hong Kong~~, virtual. Talk's title: *Nonparametric priors with full-range borrowing of information.* (June 2021).

23. 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2020), ~~London, UK~~, virtual. Talk's title: *Dependent prior processes for panel count data.* (December 2020).

Contributed talks

24. 8th INVALSI data: a tool for teaching and scientific research. (INVALSI Seminar 2023), Rome, Italy. Talk's title: *Grade gender gap: evidence from RiminiInRete.* (November 2023).

25. 14th Scientific Meeting Classification and Data Analysis Group (Cladag 2023), Salerno, Italy. Talk's title: *Bayesian forecasting of multivariate longitudinal zero-inflated counts: an application to civil conflict.* (September 2023).

26. 13th International Conference on Bayesian Nonparametrics (BNP13 2022), Puerto Varas, Chile. Talk's title: *Telescopic clustering.* (October 2022).

27. Workshop ISBA@CIRM, Marseille, France. Talk's title: *Nonparametric priors with full-range borrowing of information.* (June 2021).

28. 2021 World Meeting of the International Society for Bayesian Analysis (ISBA 2021), Kunming, China, virtual. Talk's title: *Nonparametric priors with full-range borrowing of information.* (June 2021).

29. 50th Meeting of the Italian Statistical Society (SIS 2021), virtual conference - Pisa, Italy. Talk's title: *On the dependence structure in Bayesian nonparametric priors.* (June 2021).

Awards and funding

- 2024 New Researcher Travel Award, Institute of Mathematical Statistics (IMS)

- 2024 Travel Award, BNP Networking Workshop

- 2024 Travel Award, ISBA World Meeting

- 2023-26 Task member of the National Recovery and Resilience Plan of Italy *PE1 FAIR - Future Artificial Intelligence Research - CUP B43C22000800006* group.

- 2022 Travel Award, BNP World Meeting

- 2022 Travel Award, ISBA World Meeting

- Nov 2021-Jan 2022 Research assistantship, Bocconi Institute for Data Science and Analytics, Bocconi University

- 2021 Merit-based financial support, Department of Decision Sciences, Bocconi University

- 2017-21 Merit-based Ph.D. fellowship, Department of Decision Sciences, Bocconi University

- Apr 2017-Jul 2017 Research assistantship, Department of Finance, Bocconi University

- Jul 2016-Sep 2016 Research assistantship, Department of Finance, Bocconi University

Society memberships and research networks

Institute of Mathematical Statistics (IMS); International Society for Bayesian Analysis (ISBA) [sections: Junior-ISBA, Bayesian Nonparametrics, Biostatistics and Pharmaceutical Statistics]; Italian Statistical Society (SIS) [sections: y-SIS, Classification and Data Analysis Group]; Complex Data Modeling Research Network (MiDaS).

Teaching activities

Course title	Level	Univeristy	Type of activity*	Period	Duration
Bayesian Statistical Methods	MSc	Bocconi University	CD	a.y. 2024-25	48h
Bayesian Statistical Methods	MSc	Bocconi University	CD	a.y. 2023-24	48h
Statistics	BSc	Bocconi University	L	a.y. 2020-21	20h
Financial Econometrics and Empirical Finance	MSc	Bocconi University	L	a.y. 2020-21	12h
Statistics	BSc	Bocconi University	L	a.y. 2019-20	40h
Statistics	BSc	Bocconi University	TA	a.y. 2020-21	90h
Financial Econometric and Empirical Finance	MSc	Bocconi University	TA	a.y. 2020-21	18h
Statistics	BSc	Bocconi University	TA	a.y. 2019-20	90h
Financial Econometrics and Empirical Finance	MSc	Bocconi University	TA	a.y. 2019-20	18h
Statistics	BSc	Catholic Uni. of the Sacred Heart	TA	a.y. 2019-20	24h
Statistics	BSc	Bocconi University	TA	a.y. 2018-19	90h
Financial Econometrics and Empirical Finance	MSc	Bocconi University	TA	a.y. 2018-19	18h
Quantitative Methods for Finance	BSc	Bocconi University	TA	a.y. 2018-19	57h

* CD = Course Director; L = Lecturer; TA = Teaching Assistant

Student supervision

- Supervisor for Edoardo Campiglio, **Research Assistant**, Bocconi Institute for Data Science and Analytics
- Thesis Supervisor for Edoardo Campiglio, **MSc student**, Bocconi University (expected graduation: 2025)
- Thesis Supervisor for Vladimir Badalyan, **MSc student**, Bocconi University (expected graduation: 2024)
- Thesis Supervisor for Noemi Savelkoul, **MSc student**, Bocconi University (expected graduation: 2024)
- Thesis Supervisor for Michele Graziano, **MSc student**, Bocconi University (expected graduation: 2024)
- Thesis tutor for MSc in Finance students, Bocconi University (a.y. 2016-2017)

Professional activities

- **Service to Scientific Societies**

  - **Chair** for j-ISBA section of ISBA - junior section of the International Society for Bayesian Analysis (y. 2024).
  - **Chair-Elect** for j-ISBA section of ISBA - junior section of the International Society for Bayesian Analysis (y. 2023).
  - **Executive board member of the Scientific Committee** for the Blackwell-Rosenbluth award by ISBA and j-ISBA (y. 2023)

- **Conferences organization**

  - **Member of the Scientific Committee** for the 8th Games and Decisions in Risk and Reliability Workshop, at Bocconi University, Milan, Italy. (y. 2025)
  - **Member of the Local Organizing Committee** for the 8th Games and Decisions in Risk and Reliability Workshop, at Bocconi University, Milan, Italy. (y. 2025)
  - **Member of the Scientific Committee** for the BAyesian Young Statisticians Meeting 2025 (BAYSM 2025), online. (y. 2025)
  - **Member of the Organizing Committee** for the BAyesian Young Statisticians Meeting 2025 (BAYSM 2025), online. (y. 2025)
  - **Member of the Scientific Committee** for the Satellite workshop to International Society for Bayesian Analysis (ISBA) world meeting, at Università della Svizzera Italiana (USI), Lugano, Switzerland. (y. 2024)
  - **Chair of the Scientific Committee** for the BAyesian Young Statisticians Meeting 2023 (BAYSM 2023), online. (y. 2023)
  - **Session organizer** for
    1. the 18th International Joint Conference on Computational and Financial Econometrics (CFE) and Computational and Methodological Statistics (CMStatistics), London, UK. - Session title: "Recent advances in Bayesian methods" (invited organizer - y. 2024)
    2. the 2024 International Day of Women in Statistics and Data Science (IDWSDS) - Session title: "Recent advances in Bayesian methods for covariance estimation and network data" conference (y. 2024)
    3. the Bernoulli-IMS 2024 World Congress, Bochum, Germany - Session title: "New Trends in Bayesian Nonparametrics" (y. 2024)
    4. the Joint Statistical Meeting 2024 (JSM 2024), Portland, Oregon - Session title: "Blackwell-Rosenbluth Award" (y. 2024)
    5. the 4th Italian Meeting on Probability and Mathematical Statistics 2024, Rome, Italy - Session title: "Recent Advances in Bayesian Nonparametric Statistics" (y. 2024)
    6. the RSS International Conference 2024 (RSS 2024), Brighton, UK. - Session title: "Bayesian methods for spatio-temporal data that don't take ages" (y. 2024)
    7. the International Symposium on Nonparametric Statistics 2024 (ISNPS 2024), Braga, Portugal. - Session title: "Random partitions and Bayesian dependent clustering". (invited organizer - y. 2024)
    8. the 6th International Conference on Econometrics and Statistics (ECOSTA 2023), Tokyo, Japan. - Session title: "Advances in Bayesian nonparametrics and model-based clustering". (invited organizer - y. 2023)

- **Editorial and referee activities**
  - **Editor** for *New Trends in Bayesian Statistic* - Springer Proceedings in Mathematics & Statistics (expected publication: Nov 2024)
  - **Referee** for
    * Journals: *Bayesian Analysis*, *Biostatistics*, *Computational Statistics and Data Analysis*, *Electronic Journal of Statistics*, *Journal of the American Statistical Association*, *Stat*, *Statistical Science*, and *Statistics and Computing*.
    * Competitive grant funding of Italian Ministry for University and Scientific Research.
    * Conferences and conference proceedings: *BAYSM*, *NeurIPS workshop on Bayesian Decision-making and Uncertainty*.

- **Coordinator**, monthly reading group of Statistics, at NUS and A*STAR, 2022-2023 (Singapore, Republic of Singapore).

- **Volunteer and outreach activities**
  - Data analyses for RiminiInRete, a digital database for studying and improving Rimini's school system (y. 2021-present, Rimini, Italy),
  - Webinar "STEM Morning - Science, Technology, Engineering, Mathematics" for high-school students at the University of Bologna (y. 2022, online).
  - Training course "Statistics and Data-analysis with Excel" for high-school and elementary teachers (y. 2022, online)
  - Webinar "About the relationship between students behavior and civic education grades" for high-school and elementary school teachers (y. 2022, online)
  - Seminar "Gender Differences in Primary and Secondary Schools in the Province of Rimini: Evidence from the RIR Project" for high-school and elementary school teachers (y. 2021, online)
  - European Researchers' Night 2019 (Milan, Italy),
  - Fondazione Rodolfo Debenedetti, project: racCONTAMI 2018, Third Census of Homeless People in Milan (Milan, Italy).

- **Writing assistantship** for Chapter 1 of the book "*Essentials of time series for financial applications*, Guidolin M. and Pedio M., Academic Press, 2018."

Public softwares

1. GitHub repository `EPglm`: R codes for *Scalable expectation propagation for generalized linear models*.
2. GitHub repository `BMMclassifier`: R codes for *How to leverage Bayesian mixtures for dynamic clustering and classification*.
3. GitHub repository `FuRBI`: Python and R codes for *Nonparametric priors with full-range borrowing of information*.
4. GitHub repository `CPE`: R code for *Conditional partial exchangeability: a probabilistic framework for multi-view clustering*.
5. GitHub repository `ERC`: R code for *Entropy regularization in probabilistic clustering*.
6. GitHub repository `DynamicGGM`: R code for *Change point detection in dynamic Gaussian graphical models*.
7. GitHub repository `MFMmultiHurdle`: R code for *Bayesian Clustering of Multiple Zero-Inflated Outcomes*.
8. GitHub repository `sHDP`: Python code for *Model Selection for Maternal Hypertensive Disorders with Symmetric Hierarchical Dirichlet Processes*.

Other education

2023	**Grant writing** , Introduction to grant writing: writing effective grant proposals (Singapore) *Instructor*: J. Lebrun
2018	**Graphical Models**, Bocconi Summer School in Advanced Statistics and Probability (Como, Italy)
	Instructors: S. Lauritzen (University of Copenhagen) and R. Evans (University of Oxford)
2018	**Bocconi Excellence in Advanced Teaching** (BEAT) by BUILT (Milan, Italy)

Other work experience

2016–2019   *Contributing editor*, Zanichelli editore S.p.A, (Bologna, Italy)