

Contact information

Email : beatrice.franzolini@unibocconi.it or franzolini@pm.me

Website : <https://beatricefranzolini.github.io>

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

Articles in refereed journals

1. Ascolani, F., Franzolini, B., Lijoi, A., and Prünster, I. (2024). Nonparametric priors with full-range borrowing of information, *Biometrika*, 111(3), 945–969. <https://doi.org/10.1093/biomet/asad063>
2. [*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.

3. 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>
4. 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>
5. 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>
6. 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>

Papers under Review

7. Franzolini, B., De Iorio, M., and Eriksson, J.G. (2024+). Conditional partial exchangeability: a probabilistic framework for multi-view clustering. arXiv:2307.01152
8. Anceschi, N., Fasano, A., Franzolini, B., Rebaudo, G. (2024+). Scalable expectation propagation for generalized linear models. arXiv:2407.02128

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

Ongoing works

17. Multivariate species sampling processes (ongoing, joint work with A. Lijoi, I. Prünster, and G. Rebaudo)
18. Geometry of scale mixtures (ongoing, joint work with M. De Iorio)
19. Hierarchical multiplex networks (ongoing, joint work with D. Durante and V. Ghidini)
20. An invariance-based approach to community detection in dynamic networks (ongoing, joint work with F. Gaffi)

21. Matrix-variate priors for flexible mixture modeling of grouped data (*ongoing, joint work with A. Cremaschi*)
22. [**Cross-Disciplinary**] The mediation role of maternal feeding practices in the relationship between maternal mental health and child eating behaviors: a longitudinal study (*ongoing, joint work with M. Lazarus and A. Fogel*)
23. Zero-inflated mixture regression (*ongoing, joint work with N. Anceschi, A. Fasano, G. Rebaudo*)

Conference presentations and seminars

Invited talks and seminars

1. Nonparametric Bayesian Inference - Computational Issues, ICERM, at Brown University, Providence, RI, USA. Talk's title: *TBA*. (January 2026 - upcoming).
2. BIRS Workshop on Bayesian Uncertainty Quantification in Large Models, Chennai, India. Talk's title: *TBA*. (December 2025 - upcoming).
3. Bayesian Inference in Stochastic Processes (BISP14) Talk's title: *TBA*. (May 2025 - upcoming).
4. Seminar at the ISBA-BNP webinar series Talk's title: *TBA*. (February 2025 - upcoming).
5. 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).
6. 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).
7. 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).
8. 3rd BNP Networking Workshop, Singapore, Republic of Singapore. Talk's title: *Hierarchically extended stochastic block models for multiplex networks*. (July-August 2024).
9. 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).
10. 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).
11. 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).
12. 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).
13. 4th Italian Meeting on Probability and Mathematical Statistics 2024, Rome, Italy. Talk's title: *Multivariate species sampling models*. (June 2024).
14. StaTalk2024@DiSIA UNIFI, Firenze, Italy. Talk's title: *How to leverage Bayesian mixtures for dynamic clustering and classification*. (May 2024).
15. 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).
16. 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).
17. 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).
18. Approximation Methods in Bayesian Analysis @ CIRM, Marseille, France. Talk's title: *Geometry of scale mixtures*. (June 2023).
19. 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).
20. 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).

21. 51st Meeting of the Italian Statistical Society (SIS 2022), Caserta, Italy. Talk's title: *Entropy regularization in probabilistic clustering*. (June 2022).
22. 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).
23. Foundations of Objective Bayesian Methodology Workshop, Oaxaca, Mexico. Talk's title: *Nonparametric priors with full-range borrowing of information*. (November 2021).
24. 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).
25. 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

26. 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).
27. 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).
28. 13th International Conference on Bayesian Nonparametrics (BNP13 2022), Puerto Varas, Chile. Talk's title: *Telescopic clustering*. (October 2022).
29. Workshop ISBA@CIRM, Marseille, France. Talk's title: *Nonparametric priors with full-range borrowing of information*. (June 2021).
30. 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).
31. 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).

Visiting periods

- School of Science and Technology, IE University in Madrid, Spain (Oct 2024)
- Department of Statistical Science, University College London, UK (Dec 2022)

Awards, grants, 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: Classification and Data Analysis Group, SISBayes, y-SIS]; 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 RSS International Conference 2024 (RSS 2024), Brighton, UK. - Session title: "Bayesian methods for spatio-temporal data that don't take ages" (y. 2024)
 4. the Bernoulli-IMS 2024 World Congress, Bochum, Germany - Session title: "New Trends in Bayesian Nonparametrics" (y. 2024)
 5. the Joint Statistical Meeting 2024 (JSM 2024), Portland, Oregon - Session title: "Blackwell-Rosenbluth Award" (y. 2024)
 6. the 4th Italian Meeting on Probability and Mathematical Statistics 2024, Rome, Italy - Session title: "Recent Advances in Bayesian Nonparametric Statistics" (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 Nonparametric Statistics*, *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society - Series A*, *Stat*, *Statistical Science*, and *Statistics and Computing*.
 - * Conferences and conference proceedings: *BAYSM*, *NeurIPS*.
 - * Competitive grant funding of Italian Ministry for University and Scientific Research.
 - **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 De Benedetti, 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)