

## Contact information

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

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

## Current position

Jul 2023–Present **Researcher (Italian RTD-A)**, Bocconi University, Italy.

## Past academic positions

### After PhD:

Jan 2022–Jul 2023 *Research Fellow*, Agency for Science, Technology and Research (Singapore)  
 Jan 2022–Jul 2023 *Member*, Division of Biomedical Data Science, NUS School of Medicine (Singapore)

### Before PhD:

Nov 2021–Jan 2022 *Research assistant*, Bocconi Institute for Data Science and Analytics (Milan, Italy)  
 Sep 2019–Aug 2021 *Adjunct professor*, Bocconi University (Milan, Italy)  
 Sep 2018–Aug 2021 *Teaching assistant*, Bocconi University (Milan, Italy)  
 Sep 2019–Aug 2020 *Teaching assistant*, Catholic University of the Sacred Heart (Milan, Italy)  
 Apr 2017–Jul 2017 *Research assistant*, Bocconi University (Milan, Italy)  
 Jul 2016–Jul 2017 *Tutor assisting MSc students with thesis preparation*, Bocconi University (Milan, Italy)  
 Jul 2016–Sep 2016 *Research assistant*, Bocconi University (Milan, Italy)

## Education

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

## Research interests

My research interests are in Bayesian nonparametric statistics, applied Bayesian modelling, and computational statistics, with a focus on clustering and random partition models, change-point detection, dynamic models, biomedical applications, and financial econometrics applications.

## Preprints and submitted papers

- **Franzolini, B.**, De Iorio, M., and Eriksson, J. (2023+). *Conditional partial exchangeability: a probabilistic framework for multi-view clustering*. arXiv:2307.01152 (status: submitted)
- Ascolani, F., **Franzolini, B.**, Lijoi, A., and Prünster, I. (2023+). *Nonparametric priors with full-range borrowing of information* (status: revision requested)

## Articles in refereed journals

- (1) **Franzolini, B.**, Beskos, A., De Iorio, M., Poklewski-Koziell, W. P., and Grzeszkiewicz, K. (2023). *Change-point detection in dynamic Gaussian graphical models: the impact of COVID-19 pandemic on US stock market*, The Annals of Applied Statistics, *in press*.
- (2) **Franzolini, B.** and Rebaudo, G. (2023). *Entropy regularization in probabilistic clustering*, Statistical Methods & Applications, *in press*.
- (3) **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>
- (4) **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), 20220145. <https://doi.org/10.1098/rsta.2022.0145>

## Refereed proceedings and discussions

- (5) **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, *in press*.
- (6) 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, *in press*.
- (7) 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, *in press*.
- (8) 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>
- (9) **Franzolini, B.** and Rebaudo, G. (2022). *A regularized-entropy estimator to enhance cluster interpretability in Bayesian nonparametrics*. In Book of Short Papers SIS 2022 (Editors: Balzanella, A., Bini, M., Cavicchia, C. and Verde, R.). ISBN 9788891932310
- (10) 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

## Conferences, talks, and seminars

### Invited talks

- 16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2023), Berlin, Germany (December 2023 - upcoming).
- 6th International Conference on Econometrics and Statistics (ECOSTA 2023), Tokyo, Japan (August 2023 - upcoming).
- Approximation Methods in Bayesian Analysis @ CIRM , Marseille, France (June 2023)
- 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2022), London, UK (December 2022).
- 2022 World Meeting of the International Society for Bayesian Analysis (ISBA 2022), Montreal, Canada (June 2022). Travel award (700 USD).
- 51st Meeting of the Italian Statistical Society (SIS 2022), Caserta, Italy (June 2022).
- 5th International Conference on Econometrics and Statistics (ECOSTA 2022), Kyoto, Japan (June 2022).
- Foundations of Objective Bayesian Methodology workshop, Oaxaca, Mexico (November 2021).
- 4th International Conference on Econometrics and Statistics (ECOSTA 2021), virtual conference - Hong Kong (June 2021).
- 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMSTATISTICS 2020), virtual conference (December 2020).
- 45th Arkansas Spring Lectures Series - Mathematical Sciences, virtual lectures - Fayetteville, USA (November 2020).

### Contributed talks

- 14th Scientific Meeting Classification and Data Analysis Group (Cladag 2023), Salerno, Italy (September 2023 - upcoming)
- 13th International Conference on Bayesian Nonparametrics (BNP13 2022), Puerto Varas, Chile (October 2022). Travel award (1000 USD).
- Workshop ISBA@CIRM, Marseille, France (June 2021).
- 2021 World Meeting of the International Society for Bayesian Analysis (ISBA 2021), virtual conference (June 2021).
- 50th Meeting of the Italian Statistical Society (SIS 2021), virtual conference - Pisa, Italy (June 2021).

## Awards and funding

- 2022 Travel award, BNP world meeting (1000 USD)
- 2022 Travel award, ISBA world meeting (700 USD)
- 2021 Financial support, Bocconi University
- 2017-21 Merit-based Ph.D. fellowship, Bocconi University

## Professional services

- **Chair-Elect** for j-ISBA section of ISBA - International Society for Bayesian Analysis (y. 2023).
- **Member of the scientific committee** for
  - the Blackwell-Rosenbluth award by j-ISBA (y. 2023) - j-ISBA liaison,
  - the BAYesian Young Statisticians Meeting (BAYSM:O 2023) conference by j-ISBA (y. 2023).
- **Session organizer** at the 6th International Conference on Econometrics and Statistics (ECOSTA 2023), Tokyo, Japan. Invited session title: “Advances in Bayesian nonparametrics and model-based clustering”.
- **Referee** for *Bayesian Analysis*, *BAYSM* (BAYesian Young Statisticians Meeting), *Biostatistics*, *Computational Statistics and Data Analysis*, *Journal of the American Statistical Association*, *Stat*, and *Statistical Science*.
- **Coordinator**, monthly reading group of Statistics, at NUS and A\*STAR (Singapore, Republic of Singapore).
- **Contributing editor**, Zanichelli editore S.p.A, 2016–2019 (Bologna, Italy).
- **Research assistantship** for: Guidolin, M., and Thornton D. L. *Predictions of short-term rates and the expectations hypothesis*. International Journal of Forecasting 34.4 (2018): 636-664.
- **Writing assistantship** for Chapter 1 of the book “*Essentials of time series for financial applications*, Guidolin M. and Pedio M. , Academic Press, 2018.”
- **Volunteer** for
  - RiminiInRete, a digital database for studying and improving Rimini’s school system (Rimini, Italy),
  - European Researchers’ Night 2019 (Milan, Italy),
  - Fondazione Rodolfo De Benedetti, project: racCONTAMI 2018, Third Census of Homeless People in Milan (Milan, Italy).

## Society memberships

Institute of Mathematical Statistics (IMS) ; International Society for Bayesian Analysis (ISBA); Italian Statistical Society (SIS); Complex Data Modeling Research Network (MiDaS).

## Public software

1. GitHub repository `CPE`: R code for *Conditional partial exchangeability: a probabilistic framework for multi-view clustering*
2. GitHub repository `DynamicGGM`: R code for *Change point detection in dynamic Gaussian graphical models*.
3. GitHub repository `MFMMultiHurdle`: R code for *Bayesian Clustering of Multiple Zero-Inflated Outcomes*.
4. GitHub repository `sHDP`: Python code for *Model Selection for Maternal Hypertensive Disorders with Symmetric Hierarchical Dirichlet Processes*

## Teaching activities

| Course title                                 | Level | Univeristy                              | Type of activity* | Period         | Duration |
|----------------------------------------------|-------|-----------------------------------------|-------------------|----------------|----------|
| Statistica                                   | BSc   | Bocconi University                      | T                 | a.y. 2020-2021 | 20h      |
| Financial Econometrics and Empirical Finance | MSc   | Bocconi University                      | T                 | a.y. 2020-2021 | 12h      |
| Statistica                                   | BSc   | Bocconi University                      | T                 | a.y. 2019-2020 | 40h      |
| Statistica                                   | BSc   | Bocconi University                      | TA                | a.y. 2020-2021 | 90h      |
| Financial Econometric and Empirical Finance  | MSc   | Bocconi University                      | TA                | a.y. 2020-2021 | 18h      |
| Statistica                                   | BSc   | Bocconi University                      | TA                | a.y. 2019-2020 | 90h      |
| Financial Econometrics and Empirical Finance | MSc   | Bocconi University                      | TA                | a.y. 2019-2020 | 18h      |
| Statistics                                   | BSc   | Catholic University of the Sacred Heart | TA                | a.y. 2019-2020 | 24h      |
| Statistica                                   | BSc   | Bocconi University                      | TA                | a.y. 2018-2019 | 90h      |
| Financial Econometrics and Empirical Finance | MSc   | Bocconi University                      | TA                | a.y. 2018-2019 | 18h      |
| Metodi quantitativi per la finanza           | BSc   | Bocconi University                      | TA                | a.y. 2018-2019 | 57h      |

\* T = as lecturer; TA = as teaching assistant

## 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)