

# Beatrice Franzolini

## Contact information

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## Current positions

- Jan 2022–present *Research Fellow*, Agency for Science, Technology and Research (PI: Maria De Iorio)  
(Singapore)
- Jun 2020–present *Research Affiliate*, BayesLab, Bocconi Institute for Data Science and Analytics (BIDSA)  
(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  
CRRF Functions with Epstein and Zin Function.  
*Advisor:* Luca De Angelis  
*Final Mark:* with honours (110/110 cum laude)

## Past academic positions

- Nov 2021–Jan 2022 *Research assistant*, Bocconi Institute for Data Science and Analytics (Milan, Italy)
- Sep 2017–Jan 2022 *PhD student in Statistics* (merit-based fellowship), Bocconi University (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*, Bocconi University (Milan, Italy)
- Jul 2016–Sep 2016 *Research assistant*, Bocconi University (Milan, Italy)

## Research interests

Bayesian nonparametrics, Bayesian modelling of complex data, Gaussian graphical models, Cluster Analysis, Bayesian methodology, Biostatistics, Financial econometrics.

## Papers and scientific publications

- (1) **Franzolini, B.**, Lijoi, A., and Prünster, I. (2022) *Model selection for maternal hypertensive disorders with symmetric hierarchical Dirichlet processes*, The Annals of Applied Statistics, in press.
- (2) **Franzolini, B.**, Cremaschi, A., van den Boom, W. and De Iorio, M. (2022). *Bayesian clustering of multiple zero-inflated outcomes*, Philosophical Transactions of the Royal Society A, in press.
- (3) Rebaudo G., Fasano, A., **Franzolini, B.** and Müller, P. (2022) *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, in press.
- (4) **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
- (5) 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
- (6) **Franzolini, B.** (2022) *On Dependent Processes in Bayesian Nonparametrics: Theory, Methods, and Applications*. *Ph.D. Thesis*.

## Submitted papers

- (7) Ascolani, F., **Franzolini, B.**, Lijoi, A., and Prünster, I. (2022+). *Nonparametric priors with full-range borrowing of information* (status: revision requested)
- (8) **Franzolini, B.**, Beskos, A., De Iorio, M., Poklewski-Koziell, W. P. and Grzeszkiewicz, K. (2022+). *Change-point detection in dynamic Gaussian graphical models: the impact of COVID-19 pandemic on US stock market* (status: revision requested)
- (9) **Franzolini, B.** and Rebaudo, G. (2022+). *Entropy regularization in probabilistic clustering* (status: submitted)

## Papers in preparation

- (10) **Franzolini, B.**, Lijoi, A., Prünster, I. and Rebaudo, G. (2022+). *Multivariate species sampling models* (in preparation - a preliminary version can be found in Chapter 2 of the PhD thesis)
- (11) **Franzolini, B.**, Lijoi, A. and Prünster, I. (2022+). *Dependent processes for panel count data* (in preparation - a preliminary version can be found in Chapter 5 of the PhD thesis)
- (12) **Franzolini, B.** and De Iorio, M. (2022+). *Telescopic probabilistic clustering* (in preparation)

- (13) Cremaschi A., **Franzolini, B.** and De Iorio, M. (2022+). *Bayesian nonparametric item response models: a joint analysis of eating-behaviour questionnaires and Z-BMI trajectories in GUSTO* (in preparation)
- (14) **Franzolini, B.** and De Iorio, M. (2022+). *Geometry of scale mixtures* (in preparation)

## 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

## Conferences, talks, and seminars

### Invited talks

- 6th International Conference on Econometrics and Statistics (ECOSTA 2023), Tokyo, Japan (August 2023).
- 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2022), London, UK (December 2022).
- 2022 International Indian Statistical Association Conference (IISA 2022), Bengaluru, India (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**

- 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 activities**

- Candidate as Chair-Elect for j-ISBA section of ISBA for 2022 upcoming elections.
- Referee for *Bayesian Analysis*, *Biostatistics*, *Journal of the American Statistical Association*, *Stat*, and *Statistical Science*.
- Coordinator, monthly reading group of Statistics, at NUS and A\*STAR (Singapore).
- Volunteer for RiminiInRete, a digital database for studying and improving Rimini's school system (Rimini, Italy).
- Contributing editor, Zanichelli editore S.p.A, 2016–2019 (Bologna, Italy).
- Volunteer for the European Researchers' Night 2019 (Milan, Italy).
- Volunteer for Fondazione Rodolfo De Benedetti, project: racCONTAMI 2018, Third Census of Homeless People in Milan (Milan, 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.”

## Society memberships

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

## Other education

- 2022 **Grant writing** , Taking Science for Grant-ed: writing effective grant proposals (Singapore)
- 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)

## Public softwares

- GitHub repository `DynamicGGM`: R code for *Change point detection in dynamic Gaussian graphical models*.
- GitHub repository `MFMmultiHurdle`: R code for *Bayesian Clustering of Multiple Zero-Inflated Outcomes*.
- GitHub repository `sHDP`: Python code for *Model Selection for Maternal Hypertensive Disorders with Sym-metric Hierarchical Dirichlet Processes*

## Language skills

Italian (native speaker), English (good), Spanish (basic).

## Computer skills

R, Python, MATLAB, LaTeX, Stata, SAS, and EViews.