FEDERICO CAMERLENGHI

PERSONAL INFORMATION

- Birth: July 20, 1988, Mantova, Italy.
- E-mail: federico.camerlenghi@unimib.it
- Office number: +39 0264483271

CURRENT POSITION

- **November 2022 – today:** Associate Professor of Statistics, Department of Economics, Management and Statistics, University of Milano-Bicocca, Milano, Italy.

OTHER AFFILIATIONS

- **May 2019 – today:** Affiliate, Collegio Carlo Alberto (Piazza V. Arbarello 8, Torino) for the participation to the ERC consolidator grant NBEB-SSP (PI Prof. Stefano Favaro).
- **December 2016 – today:** Affiliate, BIDSA (Bocconi Institute for Data Science and Analytics), Bocconi University, Milano.

PAST POSITIONS

- **November 2019 – October 2022:** Senior assistant Professor (RTDb), Department of Economics, Management and Statistics, University of Milano-Bicocca, Milano, Italy.
- **January 2018 – October 2019:** Junior assistant Professor (RTDa), Department of Economics, Management and Statistics, University of Milano-Bicocca, Milano, Italy.
- **January 2017 – December 2017:** Postdoctoral fellow, Department of Statistical Sciences, University of Bologna, Bologna.
- **January 2016 – December 2016**: Postdoctoral fellow, Department of Decision Sciences, Bocconi University, Milano.
- **July 2014 – December 2019:** Affiliate, *de Castro* Statistics Initiative, Collegio Carlo Alberto, Moncalieri (TO).

EDUCATION

- **October 2012 – November 2015:** Ph.D. in Mathematics and Statistics, University of Pavia. Supervisors: Prof. Antonio Lijoi and Prof. Igor Prünster. Thesis defense: December 1, 2015.
- **November 2012 – December 2016:** Student of the Biomedical University Residence, Pavia.
- **October 2010 – September 2012:** Master of Science in Mathematics, University of Milano. Degree: 110/110 cum laude.
- **October 2007 – September 2010:** Bachelor of Science in Mathematics, University of Modena and Reggio Emilia. Degree: 110/110 cum laude.

HONORS AND AWARDS

<u>Awards:</u>
- **2022**: Early-Career Scholar Award for Contributions to Statistics "Premio a giovani studiosi e studiose per contributi alle discipline statistiche", assigned yearly by the Italian Statistical Society (SIS) to the best statistician in Italy under the age of 40.
- **2019:** National Scientific Qualification (ASN) to the role of Associate Professor in the area 13/D1 STATISTICS from 20/12/2019 to 20/12/2028.
- **2019**: Winner of the award "Premio Giovani Talenti 2019", University of Milano – Bicocca, Italy.
- **December 2018**: Joint recipient of a European Research Council (ERC) Consolidator Grant. Research team: Federico Camerlenghi, Emanuele Dolera, Stefano Favaro (PI).
- **2017**: Savage award in Theory and Methods, International Society for Bayesian Analysis.

- **2016**: award for the best Ph.D. thesis in Statistics, Italian Statistical Society.
- **2012**: Phd Scholarship, University of Pavia, Italy.
- Received the merit-based tuition refund scholarship (granted to the top students of the Faculty of Science at the University of Modena and Reggio Emilia) for the academic years **2007-2008, 2008-2009, 2009-2010**.
- Received the merit-based Student Prize "Premio di Studio" at the University of Modena and Reggio Emilia in the academic years **2007-2008, 2008-2009, 2009-2010**.
- Received the merit-based Student Prize "Premio di Laurea" at the University of Modena and Reggio Emilia for the academic year 2009-2010: first place among all the students of the Faculty of Science.

Travel awards:
- **2016**: travel award grant from the Biomedical University Residence (Pavia) to attend the Statalk Computational tools for Statistical Modeling, Roma, September 2016.
- **2016**: ISBA travel award to attend ISBA world meeting 2016, Santa Margherita di Pula (CA), Italy.
- **2015**: travel award grant from the Biomedical University Residence (Pavia) to attend the 10thconference on Bayesian Nonparametrics (BNP10), Raleigh, USA.
- **2015**: US National Science Foundation travel award to attend O-Bayes15, Valencia, Spain.
- **2014**: travel award grant from the Biomedical University Residence (Pavia) to attend the ISBA 2014 world meeting, Cancun, Mexico.
- **2013**: travel award to attend the ERC School on Geometric Measure Theory and Real Analysis, organized by the "Centro De Giorgi" (Pisa, Italy).

VISITING PERIODS

- **April 4 – May 4, 2016**: Department of Statistics, University of Michigan, USA (invited by Prof. Xuanlong Nguyen).

TALKS & POSTER PRESENTATIONS

Invited talks:
- **September 6 – 10, 2022:** Objective Bayes Methodology Conference **(**O'Bayes 2022), University of California Santa Cruz, USA. Title of the talk (with discussion): *Nested nonparametric processes.*
- **June 22 – 24, 2022:** 51st meeting of the Italian Statistical Society (SIS2022), Caserta, Italy. Title of the talk: *Dependent nonparametric priors*, talk for the Early-Career Scholar Award for Contributions to Statistics.
- **April 20, 2022:** invited Webinar organized by the BNP section of ISBA. The title of the talk, jointly held with Lorenzo Masoero, is *Bayesian nonparametric priors for genomic variant discoveries.*
- **December 10, 2021**: Disclosure control meeting, organized online in Japan. Title of the talk: *Nonparametric disclosure risk assessment.*
- **April 21, 2021**: Invited discussion of the online session *Developments in Bayesian nonparamterics*, organized by YoungStatS.
- **July 29 – August 2, 2019:** 21st European Young Statisticians Meeting, Belgrade, Serbia. Title of the talk: *Hierarchical Nonparametric Processes*.
- **June 18 – 21, 2019:** SIS 2019 Smart Statistics for Smart Applications, Milan, Italy. Title of the talk: *Hierarchies of nonparametric priors*.
- **December 14 – 16, 2018:** 11th international conference of the ERCIM, Pisa, Italy. Title of the talk*: Bayesian prediction with heterogeneous populations: an application to feature sampling.*
- **September 9 – 13, 2018:** Japanese Joint Statistical Meeting 2018, Tokyo, Japan. Title of the talk: *Full Bayesian inference for dependent nonparametric priors*.
- **July 29 – August 3, 2017:** Joint Statistical Meeting (JSM 2017), Baltimore, USA. Title of the talk: *Hierarchical and nested random probability measures with statistical applications.*
- **June 19 – 22, 2017:** First Italian meeting on probability and mathematical statistics, Torino, Italy Title of the talk: *Dependent hierarchical processes for multi-armed bandits.*
- **September 8, 2016:** Department of Economics, Sapienza University, Roma, Italy. Title of the talk: *Distribution theory for hierarchical processes with statistical applications.*
- **June 13 – 17, 2016**: ISBA 2016 world meeting, Santa Margherita di Pula (CA), Italy. Title of the talk: *Nested processes based on completely random measures.*

- **June 8 – 10, 2016**: 48th Scientific Meeting of the Italian Statistical Society, Salerno, Italy.Title of the talk: *Hierarchical and nested random probability measures with statistical applications.* (Specialized session for the Best Ph.D. Thesis prize)
- **December 12 – 14, 2015**: 8th international conference of the ERCIM WG on computational and methodological Statistics, University of London, UK. Title of the talk: *Nonparametric hierarchical models based on completely random measures.*
- **September 12, 2014**: Workshop on *Random Structures and Models in Medicine, Biotechnology, Material Science and Environment,* Department of Mathematics, Milano. Title of the talk: *Estimation of the mean density of random closed sets: theoretical results and numerical experiments.*

Contributed talks:

- **June 26 – July 1, 2022:** 2022 ISBA world meeting, Montreal, Canada. Title of the talk: *Scaled process priors for the BNP estimation of the unseen genetic variation.*
- **June 21 – 25, 2021**: 50th Scientific Meeting of the Italian Statistical Society, held virtually, Italy. Title of the talk: *Bayesian nonparametric prediction: from species to features.*
- **December 14 – 16, 2019**: 12th international conference of the ERCIM WG on computational and methodological Statistics, University of London, UK. Title of the talk: *Missing mass estimation in feature sampling.*
- **June 24 – 28, 2019:** 12th conference on Bayesian Nonparametrics (BNP11), Oxford, UK. Title of the talk: *Bayesian Prediction in Feature Models.*
- **June 26 – 30, 2017:** 11th conference on Bayesian Nonparametrics (BNP11), Paris, France. Title of the talk: *Dependent nonparametric priors for partially exchangeable data.*
- **January 23 – 25, 2017**: YES VIII workshop on uncertainty quantification, EURANDOM, Eindhoven, The Netherlands. Title of the talk: *Hierarchical hazard rates for partially exchangeable survival times.*
- **March 1 – 4, 2016**: 12th German Probability and Statistics Days, Rhur-Universität Bochum, Germany. Title of the talk: On the "Minkowksi content"-based estimator of the mean density of lower dimensional random closed sets.

Poster presentations:

- **June 24 – 29, 2018:** ISBA 2018 world meeting, Edinburgh, UK.
- **June 20 – 22, 2018:** 49th meeting of the Italian Statistical Society, Palermo, Italy.
- **December 9, 2016:** Workshop on Practical Bayesian Nonparametrics at NIPS 2016, Barcelona, Spain.
- **June 22 – 26, 2015:** 10th conference on Bayesian Nonparametrics (BNP10), Raleigh, USA.
- **June 1 – 5, 2015:** 11th international workshop on Objective Bayes Methodology (O-Bayes15), Valencia, Spain.

ORGANIZATION OF CONFERENCES & SESSIONS

- **December 17 – 19, 2022:** organizer of the invited session Computational and methodological advances in Bayesian nonparametrics at the 15th international conference of the ERCIM WG, London, UK. (to be held)
- **December 18 – 20, 2021:** organizer of the invited session *Bayesian nonparametrics: Modeling and computation* at the 14th international conference of the ERCIM, London, UK.
- **September 1 – 3, 2021:** member of the scientific committee of *Bayesian Young Statisticians Meeting* BAYSM 2021, online conference.
- **December 14 – 16, 2019:** organizer of the invited session *Bayesian Inference via Discrete Nonparametric Priors* at the 12th international conference of the ERCIM, London, UK.
- **December 14 – 16, 2018:** organizer of the invited session *Computational and Methodological Advances in Bayesian Nonparametrics* at the 11th international conference of the ERCIM, Pisa, Italy. The session was sponsored by jISBA.
- **June 20 – 22, 2018:** co-organizer of the specialized session *Young contributions to Statistical Learning* at the 49th meeting of the Italian Statistical Society, Palermo, Italy. The session was sponsored by ySIS.
- **June 25 – 27, 2017**: member of the local organizing committee of Start up Research, Certosa di Pontigniano, Siena, Italy. Start up Research was a satellite event of the SIS conference on Statistics and Data Science.

SCHOOLS

- **June 16 – 20, 2014**: Applied Bayesian Statistics School (ABS14). Applied Bayesian Nonparametrics, Como, Italy. Lecturers: Micheal Jordan, Francois Caron.
- **September 30 – October 4, 2013:** ERC School on Geometric Measure Theory and Real Analysis, organized by the "Centro De Giogi" (Pisa, Italy). Lecturers: Vladimir Bogachev, Roberto Monti, Emanuele Spadaro, Davide Vittone.

- **July 1 – 19, 2013**: Summer School in Cortona, Italy. Introduction to Distributional Approximation and Stein's Method. Lecturers: Larry Goldstein, Yosef Rinott. Final grade: A.

TEACHING ACTIVITY

Ph.D. courses:
- Co-instructor, with Prof. Bernardo Nipoti, of the reading group *Bayesian Nonparametric Mixture Models*, Phd in Economics and Statistics, University of Milano-Bicocca, Italy. (aa.yy. 2020/2021, 2021/2022; 15 hours per year)
- Instructor for the courses *Probability 1* and *Probability 2*, PhD in Economics and Statistics, University of Milano-Bicocca, Milan, Italy. (aa.yy. 2018/2019, 2019/2020, 2020/2021, 2021/2022; 30 hours per year)

Ordinary courses:
- Co-instructor for the course *Advanced Mathematics and Statistics*, BEMACS (Bachelor of Science in Economics, Management and Computer Science), Bocconi University, Milano, Italy. (aa.yy. 2018/2019, 2019/2020, 2020/2021, 2021/2022)
- Co-instructor for *Statistica 2*, Bachelor degree in Statistical and Economics Sciences, University of Milano-Bicocca, Milano, Italy. (aa.yy. 2018/2019, 2019/2020, 2020/2021, 2021/2022)
- Instructor for the course *Metodi per le Indagini Campionarie M*, Master degree in Statistics and Economics, University of Milano-Bicocca, Milano, Italy. (aa.yy. 2017/2018, 2018/2019, 2019/2020, 2020/2021, 2021/2022)
- Tutor for the course of *Inference* (Bayesian Statistics) at the department of Statistical Sciences, University of Bologna, Bologna, Italy. (a.y. 2016/2017)
- Teaching assistant for the course *Analisi Matematica 1* at the department of engineering, University of Pavia, Pavia, Italy. (aa.yy. 2014/2015, 2015/2016)
- Teaching assistant for the course *Analisi Matematica 2* (calculus for functions in several variables) at the department of engineering, University of Pavia, Pavia, Italy. (a.y. 2013/2014)

LOCAL ADMINISTRATIVE DUTIES

- **2020 – today**: board member of the program committee of the Ph.D. program in Economics and Statistics (ECOSTAT), University of Milano – Bicocca.

EDITORIAL ACTIVITIES

- **Referee for**: Annals of Statistics; Bayesian Analysis; Computational Statistics & Data Analysis; Electronic Journal of Statistics; IEEE Transactions on Information Theory; International Journal of Approximate Reasoning; Journal of the American Statistical Association; Journal of Statistical Planning and Inference; Proceedings of the Royal Society A; Scandinavian Journal of Statistics; Statistics and Computing; Statistics and Probability Letters; Statistical Methods and Applications; Statistica Sinica.
- Co-editor of the volume: *Methodological and computational contributions on Bayesian Statistics* – BaYSM2021 proceedings, Springer Proceedings in Mathematics & Statistics.

PROFESSIONAL SERVICES

- **2019:** Chair of the junior ISBA board (junior section of the International Society for Bayesian Analysis).
- **2018**: Chair-elect member of the junior ISBA board (junior section of the International Society for Bayesian Analysis).
- **2017**: Chair of the board of the young group of the Italian Statistical Society (ySIS).
- **2016**: Member of the board of the young group of the Italian Statistical Society (ySIS).

SOCIETY MEMBERSHIP

Italian Statistical Society; International Society for Bayesian Analysis; National group for Mathematical Analysis, Probability and their Applications (GNAMPA) of the national institute of Mathematics (INdAM).

RESEARCH PROJECT GRANTS

- Co-investigator, European Research Council (ERC) project (2019-2024): *Nonparametric Bayes and empirical Bayes for species sampling problems: classical questions, new directions and related issues*. Research team: Federico Camerlenghi, Emanuele Dolera, Stefano Favaro (PI), Zacharie Naulet.
- Co-investigator of the GNAMPA research project 2021 *Stime asintotiche: principi di invarianza e grandi deviazioni*, scientific coordinator Prof. Barbara Pacchiarotti (12 months).
- Co-investigator of the GNAMPA research project 2017 *Bayesian methods for the analysis of exchangeable and partially exchangeable sequences of observations, with applications to species sampling problems*, scientific coordinator Prof. Emanuele Dolera (12 months).
- Co-investigator of the GNAMPA research project 2016 *Partially exchangeable sequences of observations in Bayesian Statistics*, scientific coordinator Prof. Federico Bassetti (12 months).
- Co-investigator of the GNAMPA research project 2014 *Some problems of statistical inference for partially exchangeable sequences of observations*, scientific coordinator Prof. Federico Bassetti (12 months).
- Co-investigator of the GNAMPA research project 2013 *Markovian quantum evolution*, scientific coordinator Prof. Raffaella Carbone (12 months).

STUDENT SUPERVISION

Ph.D. supervisions:
- Riccardo Cogo, Ph.D. student (co-advised with Tommaso Rigon). Expected defence: January 2025.
- Lorenzo Ghilotti, Ph.D. student. Expected defence: January 2026.

Ph.D. tutorships:
- Luca Presicce, Ph.D. student. Expected defence: January 2026.

PUBLICATIONS

Articles in refereed journals:
- F. Camerlenghi, S. Favaro, L. Masoero, T. Broderick (2022+). Scaled process priors for Bayesian nonparametric estimation of the unseen genetic variation. *Journal of the American Statistical Association,* to appear.
- L. Masoero, F. Camerlenghi, S. Favaro, T. Broderick (2022). More for less: Predicting and maximizing genetic variant discovery via Bayesian nonparametrics. *Biometrika*, **109**, 17-32.
- F. Denti, F. Camerlenghi, M. Guindani, A. Mira (2022+). A common atoms model for Bayesian nonparametric analysis of nested data. *Journal of the American Statistical Association,* to appear, https://doi.org/10.1080/01621459.2021.1933499
- Camerlenghi, S. Favaro (2021). On Johnson's "Sufficientness" Postulates for Feature-Sampling Models. *Mathematics*, special issue "Bayesian Predictive Inference and Related Asymptotics—Festschrift for Eugenio Regazzni's 75th Birthday", 9, 2891.
- F. Ayed, M. Battiston, F. Camerlenghi, S. Favaro (2021). Consistent estimation of small masses in feature sampling. *Journal of Machine Learning Research*, **22,** 1-28.
- F. Camerlenghi, A. Lijoi, I. Prünster (2021). Survival analysis via hierarchically dependent mixture hazards. *The Annals of Statistics,* **49**, 863-884.
- F. Camerlenghi, S. Favaro, Z. Naulet, F. Panero (2021). Optimal disclosure risk assessment. *The Annals of Statistics,* **49**, 723-744.
- F. Ayed, M. Battiston, F. Camerlenghi, S. Favaro (2021). On consistent and rate optimal estimation of the missing mass. *Annales de l'Institut Henri Poincaré - Probabilités et Statistiques*, **57**, 1476-1494.
- F. Camerlenghi, C. Macci, E. Villa (2020). Asymptotic behavior of mean density estimators based on a single observation: the Boolean model case. *Annals of the Institute of Statistical Mathematics,* **73**, 1011-1035.
- F. Camerlenghi, B. Dumitrascu, F. Ferrari, B. E. Engelhardt, S. Favaro (2020). Nonparametric Bayesian multi-armed bandits for single cell experiment design. *The Annals of Applied Statistics*, **14**, 2003-2019.
- F. Ayed, M. Battiston, F. Camerlenghi (2020). An Information theoretic approach to Post Randomization Methods under Differential Privacy. *Statistics & Computing*, **30**, 1347-1361.
- F. Ayed, M. Battiston, F. Camerlenghi, S. Favaro (2019). A Good-Turing estimator for feature allocation models. *Electronic Journal*

of Statistics, **13**, 3775-3804.

- F. Camerlenghi, D.B. Dunson, A. Lijoi, I. Prünster, A. Rodriguez (2019). Latent nested nonparametric priors. *Bayesian Analysis,* **14**, 1303-1356. (with discussion)
- F. Camerlenghi, A. Lijoi, P. Orbanz, I. Prünster (2018). Distribution theory for hierarchical processes. *The Annals of Statistics*, **47**, 67-92.
- F. Camerlenghi, A. Lijoi, P., I. Prünster (2018). Bayesian nonparametric inference beyond the Gibbs-type framework. *Scandinavian Journal of Statistics,* **45**, 1062-1091.
- F. Camerlenghi, E. Villa (2017). Large and moderate deviations for kernel-type estimators of the mean density of Boolean models. *Electron. J. Stat.,* **12**, 427-460.
- F. Camerlenghi, A. Lijoi, I. Prünster (2017). Bayesian prediction with multiple--sample information. *J. Multivariate Anal.,* **156**, 18-28.
- F. Camerlenghi, C. Macci, E. Villa (2016). Asymptotic results for multivariate estimators of the mean density of random closed sets. *Electron. J. Stat.,* **10**, 2066-2096.
- F. Camerlenghi, E. Villa (2015). Optimal bandwidth of the "Minkowski content"-based estimator of the mean density of random closed sets: theoretical results and numerical experiments. *J. Math. Imaging Vision*, **53**, 264-287.
- F. Camerlenghi, V. Capasso, E. Villa (2014). Numerical experiments for the estimation of mean densities of random sets. *Image Anal. Stereol.*, **33**, 83-94.
- F. Camerlenghi, V. Capasso, E. Villa (2014). On the estimation of the mean density of random closed sets. *J. Multivariate Anal.,* 125, 65-88.

Conference proceedings:

- F. Denti, F. Camerlenghi, M. Guindani, A. Mira (2022). Clustering artists based on the energy distributions of their songs on Spotify via the Common Atoms Model. In Book of the short papers SIS 2022
- F. Camerlenghi, R. Corradin, A. Ongaro (2021). On the convex combination of a Dirichlet process with a diffuse probability measure. In Book of short papers - SIS 2021 (pp.739-744). Pearson.
- L. Masoero, F. Camerlenghi, S. Favaro, T. Broderick (2021). Bayesian nonparametric prediction: from species to features. In Book of short papers - SIS 2021 (pp.727-732). Pearson.
- F. Camerlenghi, A. Lijoi, I. Prünster (2020). Bayesian nonparametric prediction with multi-sample data. In ISNPS 2018, Springer Proceedings in Mathematics & Statistics, **339**, 113-121.
- F. Ayed, M. Battiston, F. Camerlenghi (2019). A formal approach to data swapping and disclosure limitation techniques. Book of Short Papers SIS2019 Smart Statistics for Smart Applications, 47-54.
- F. Camerlenghi, C. Carota, S. Favaro (2019). Issues on Bayesian nonparametric measures of disclosure risk. Book of Short Papers SIS2019 Smart Statistics for Smart Applications, 119-124.
- F. Camerlenghi, S. Favaro, L. Masoero (2019). Hierarchies of nonparametric priors. Book of Short Papers SIS2019 Smart Statistics for Smart Applications, 125-132.
- F. Camerlenghi, S. Favaro, Z. Naulet, F. Panero (2019). Issues with nonparametric disclosure risk assessment. Book of Short Papers SIS2019 Smart Statistics for Smart Applications, 133-139.
- F. Camerlenghi, A. Lijoi, I. Prünster (2018). Density estimation via hierarchies of nonparametric priors. *In JSM Proceedings, Section on Bayesian Statistical Science.* Alexandria, VA: American Statistical Association, 2596-2605.
- M. Battiston, F. Camerlenghi, E. Dolera, S. Favaro (2018). Estimating the number of unseen species under heavy tails. Proceedings of the 49th Scientific Meeting of the Italian Statistical Society.
- F. Camerlenghi, A. Lijoi, I. Prünster (2017). On some distributional properties of hierarchical processes. In JSM Proceedings, Section on Bayesian Statistical Science. Alexandria, VA: American Statistical Association, 853-860.
- F. Camerlenghi, I. Prünster, M. Ruggiero (2016). On time-dependent Gibbs-type random probability measures. *In JSM Proceedings, Section on Nonparametric Statistics*. Alexandria, VA: American Statistical Association, 1969-1976.

Books:

- F. Camerlenghi (2019). Hierarchical and nested random probability measures with statistical applications. Best Phd Thesis In Statistics And Applications. Demography. Statistics. Applied Statistics. Cleup.

Submitted and working papers:

- F. Camerlenghi, R. Corradin, A. Ongaro (2021+). Contaminated Gibbs-type priors. *Submitted*, https://arxiv.org/abs/2108.11997
- F. Camerlenghi, R. Corradin, A. Ongaro (2022+). CoRMs-based nested nonparametric priors. *In preparation.*

- C. Balocchi, F. Camerlenghi, S. Favaro (2022+). Ordered Pitman-Yor process. *In preparation.*
- F. Camerlenghi, A. Lijoi, B. Nipoti, I. Pruenster (2022+). Full Bayesian inference with dependent normalized completely random measures. *In preparation.*

Milan, 02/11/2022

Federico Camerlenghi