Giovanni Rebaudo

Contact Information

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Current Positions

University of Torino, Turin, Italy
Assistant Professor of Statistics (RTDA secs-s/01) **3/2023–Present**
Department of Economics, Social Studies, Applied Mathematics and Statistics (ESOMAS)

Collegio Carlo Alberto, Turin, Italy
Research affiliate, "de Castro" Statistics Initiative **3/2023–Present**

Bocconi Institute for Data Science and Analytics (BIDSA), Milan, Italy
Research affiliate, Bayesian Learning Laboratory (Bayes Lab) **6/2020–Present**

Past Position

University of Texas at Austin, Texas, USA
Post–Doctoral Research Fellow, Department of Statistics and Data Sciences **10/2020–2/2023**
Mentors: Peter Müller and Abhra Sarkar

Education

Bocconi University, Milan, Italy
Ph.D. in Statistics. Awarded with honors **9/2016–9/2020 (Thesis Defense 2/2021)**
- Title: *Bayesian Inference for Complex Data Structures: Theoretical and Computational Advances*
- Advisors: Antonio Lijoi and Igor Prünster

University of Trieste, Trieste, Italy
M.S. in Statistical and Actuarial Sciences. Final mark: 110/110 with honors **9/2014–7/2016**
- Title: *Bayesian Hierarchical Model: Theory and Application*
- Advisors: Francesco Pauli and Nicola Torelli

University of Milano-Bicocca, Milan, Italy
B.S. in Statistical and Economic Sciences. Final mark: 110/110 with honors **9/2011–7/2014**
- Title: *A New Technique for Estimation of Logarithmic Time Series Models: Forecast Comparison Based on Economic Data*
- Advisor: Matteo Maria Pelagatti

Research Interests

Bayesian Methods and Computation, Cluster Analysis, Bayesian Nonparametrics, Dimensionality Reduction, Time-Series Analysis, Predictive Inference, Categorical Regression, Auditory Neuroscience, Single-Cell RNA.

Publications

Papers in Peer-Reviewed Journals

1. Roark, C. L., Paulon, G., Rebaudo, G., McHaney, J. R., Sarkar, A. and Chandrasekaran, B. (2024). **Individual differences in working memory impact the trajectory of non-native speech category learning.** *PLOS ONE*, in press.
2. Franzolini, B. and Rebaudo G. (2024) **Entropy regularization in probabilistic clustering.** *Statistical Methods & Applications*, in press.
3. Ascolani, F., Lijoi, A., Rebaudo, G. and Zanella, G. (2023). **Clustering consistency with Dirichlet process mixtures.** *Biometrika*, 110, 551–558.
4. Lijoi, A., Prünster, I. and Rebaudo, G. (2023). **Flexible clustering via hidden hierarchical Dirichlet priors.** *Scandinavian Journal of Statistics*, 50, 213–234.
5. Fasano, A., Rebaudo, G., Durante D. and Petrone S. (2021). **A closed-form filter for binary time series**. *Statistics and Computing*, 31:47, 1–20.

Papers under Review

6. Rebaudo G. and Müller, P. **Graph-aligned random partition model (GARP).**
7. Lin Q., Rebaudo G. and Müller, P. **Separate exchangeability as modeling principle in Bayesian nonparametrics.**
8. Rebaudo G., Llanos, F., Chandrasekaran B. and Sarkar, A. **Bayesian mixed multidimensional scaling for auditory processing.**

Discussions

9. Catalano, M., Fasano, A., Giordano, M. and Rebaudo G. (2024) **A discussion on: "Root and community inference on the latent growth process of a network" by Crane H. and Xu M.** *Journal of the Royal Statistical Society Series B*, in press.
10. Catalano, M., Fasano, A. and Rebaudo G. (2023) **A discussion on: "Martingale posterior distributions" by Fong, E., Holmes C. and Walker S.** *Journal of the Royal Statistical Society Series B*, 85, 1406–1407.
11. 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, 345–347.

Conference Proceedings and Book Chapters (Peer-Reviewed)

12. Anceschi N., Fasano, A. and Rebaudo G. (2023). **Expectation propagation for the smoothing distribution in dynamic probit.** *Bayesian Statistics, New Generations New Approaches (BaYSM2022), Springer Proceedings in Mathematics and Statistics* , 435, 105–115.
13. Fasano, A., Anceschi N., Franzolini, B. and Rebaudo G. (2023). **Efficient computation of predictive probabilities in probit models via expectation propagation.** *Book of Short Papers - CLADAG 2023*, 449–452.
14. Franzolini, B., Bondi, L., Fasano, A. and Rebaudo G. (2023). **Bayesian forecasting of multivariate longitudinal zero-inflated counts: an application to civil conflict.** *Book of Short Papers - CLADAG 2023*, 465–468.
15. Fasano, A., Anceschi N., Franzolini, B. and Rebaudo G. (2023). **Efficient expectation propagation for posterior approximation in high-dimensional probit models.** *Book of Short Papers - SIS 2023*, 1133–1138.
16. Fasano, A., Rebaudo G. and Anceschi N. (2022). **Bayesian inference for the multinomial probit model under Gaussian prior distribution.** *Book of Short Papers - SIS 2022*, 871–876.
17. Franzolini, B. and Rebaudo G. (2022). **A regularized-entropy estimator to enhance cluster interpretability in Bayesian nonparametric.** *Book of Short Papers - SIS 2022*, 387–398.
18. Fasano, A. and Rebaudo G. (2021). **Variational inference for the smoothing distribution in dynamic probit models.** *Book of Short Papers - SIS 2021*, 1076–1081.

Awards

Academic Awards

[2023] Assistant professor research prize (Premialità RTD), University of Torino.
[2020] Special financial support, Bocconi University.
[2020] Research fellowship, Bocconi University.
[2016-20] Merit-based Ph.D. fellowship, Bocconi University.

Data Competitions

[2018] **Predictive challenge:** best objective prediction. **Stat Under the Stars 4**.
[2017] **Predictive challenge:** first position. YoungCLADAG data contest.

Travel Awards

[2024] Travel award, ISBA world meeting (300$).
[2023] Travel award, IISA conference (750$).
[2022] Travel award, BNP world meeting (1000$).
[2022] Travel award, ISBA world meeting (300$).
[2019] Travel award, O'Bayes conference (400£).

Service to Profession

Referee (alphabetical order)

• Annals of Applied Statistics • Annals of Statistics • Bayesian Analysis • Bayesian Young Statisticians Meeting • Electronic Journal of Statistics • Journal of Machine Learning Research • Operations Research • Scandinavian Journal of Statistics • Statistical Methods & Applications • Statistical Science.

Judge for Paper Competitions

[2023, 2024] Student Paper Competition for Section on Bayesian Statistical Science (SBSS) of the American Statistical Association (ASA).

Organization of Scientific Events

- **Organizer** of European Young Statisticians Meeting (EYSM) 2025, Collegio Carlo Alberto, Turin, Italy.

Volunteer

- European Researchers' Night. Turin, Italy (2024).
- European Researchers' Night. Milan, Italy (2019).

Local Duties

Students and Postdocs Supervised

Current Postdocs

Lorenzo Rimella

Former B.Sc. Students

Paolo Ciriacì, B.Sc. in Economics and Data Science at the University of Torino (2023).

Committees

- Committee member for the assignment of teaching positions at the University of Torino.
- Committee member for the assignment of postdoctoral research positions at the University of Torino.

Website Management

- Updating the webpages for the "de Castro" Statistics Initiative on the Collegio Carlo Alberto website.

Research Networks & Memberships

I am a member of the:
Complex Data Modeling Research Network led by MiDaS, Institute of Mathematical Statistics [IMS], International Society for Bayesian Analysis [ISBA], Italian Statistical Society [SIS].

Grants & Funding

Principal Investigator of the ESOMAS Department research project "Bayesian models for interpretable random structures" (Duration: 2023-25).

Member of the PNRR Research Project of National Interest (PRIN-PNRR) group "Measuring biodiversity via Bayesian nonparametrics: estimation, clustering and uncertainty quantification." (National Coordinator: Igor Prünster; Duration: 2023-25).

Member of the Research Project of National Interest (PRIN) group "Discrete random structures for Bayesian learning and prediction." (National Coordinator: Antonio Lijoi; Duration: 2023-25).

Member of the NIH project research group "Bayesian methods for optimizing combination antiretroviral therapy for mental health in people with HIV" (Principal Investigator: Yanxun Xu; Duration: 2022-27).

Member of the NSF project research group "Novel statistical frameworks for local inference in neuroscience of learning" (Principal Investigator: Abhra Sarkar; Duration: 2020-23).

Member of the NSF project research group "Collaborative research: Bayesian inference for interpretable random structures" (Principal Investigator: Peter Müller; Duration: 2020-23).

Member of the Research Project of National Interest (PRIN) group "Modern Bayesian nonparametric methods" (National Coordinator: Igor Prünster; Duration: 2017-20).

Teaching Experience

Teaching Certificates

- IRIDI START: Quality teaching, evaluation and inclusion, University of Torino (2024).
- Bocconi Excellence in Advanced Teaching by BUILT (**BEAT**) (2019).

Lecturer at **University of Torino**, Turin, Italy

- Statistics - B.Sc. (AY 2022/2023, 2023/2024).
- Introduction to Data Science: Statistical Learning and Data Analytics - B.Sc. (AY 2022/2023, 2023/2024).

Guest Lecturer at **University of Texas at Austin**, Texas, USA

- Monte Carlo Methods - Ph.D. (AY 2022/2023).
- Mathematical Statistics I - Ph.D. (AY 2022/2023).
- Introduction to Mathematical Statistics - B.Sc. (AY 2022/2023).

Teaching Assistant at **Bocconi University**, Milan, Italy

- Machine Learning II - M.Sc. (AY 2020/2021, AY 2019/2020).
- Data Analysis - M.Sc. (AY 2019/2020, AY 2018/2019, AY 2017/2018).

Schools

[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).

[2017] **Statistical Causal Learning**.
Bocconi Summer School in Advanced Statistics and Probability. Como, Italy.
Instructors: B. Schölkopf (Max Planck Institute for Intelligent Systems, Tübingen), I. Tolstikhin (Google AI, Zürich) and D. Lopez-Paz (Facebook AI Research, Paris).

Presentations

Invited Presentations

[2024] Frontiers of Bayesian Inference and Data Science [BIRS–CMO Workshop]. Oaxaca, Mexico.
[2024] Interpretable Inference via Principled BNP Approaches in Biomedical Research and Beyond. Singapore, SG.
[2024] ISNPS 2024 [International Symposia on Nonparametric Statistics]. Braga, Portugal.
[2023] EcoSta 2023 [International Conference on Econometrics and Statistics]. Tokyo, Japan.
[2023] Approximation Methods in Bayesian Analysis [CIRM Workshop]. Luminy, France.
[2022] IISA Conference 2022 [International Indian Statistical Association]. Bangalore, India.
[2022] ISBA 2022 [International Society of Bayesian Analysis]. Montreal, Canada.
[2021] CMStatistics–ERCIM 2021 [14th International Conference of the ERCIM WG on Computational and Methodological Statistics]. London, UK (online).
[2021] Foundations of Objective Bayesian Methodology [BIRS–CMO Workshop]. Oaxaca, Mexico.
[2021] EcoSta 2021 [International Conference on Econometrics and Statistics]. Hong Kong (online).
[2021] BISP 12 [Bayesian Inference in Stochastic Processes]. Milan, Italy, with discussion (online).
[2020] CMStatistics–ERCIM 2020 [13th International Conference of the ERCIM WG on Computational and Methodological Statistics]. London, UK (online).
[2019] IIASA Conference 2019 [International Indian Statistical Association]. Mumbai, India.
[2019] Second Italian Meeting in Probability and Statistics. Vietri sul Mare, Italy.

Contributed Presentations

[2022] BNP13 [International Conference on Bayesian Nonparametrics]. Puerto Varas, Chile.
[2022] ENAR Meeting [Eastern North American Region International Biometric Society]. Houston, USA (online).

Poster Presentations

[2024] ISBA 2024 [International Society of Bayesian Analysis]. Venice, Italy.
[2019] O'Bayes 2019 [Objective Bayes Methodology Conference]. Warwick, United Kingdom.
[2019] BNP12 [International Conference on Bayesian Nonparametrics]. Oxford, United Kingdom.

Seminars

[2024] Mathematics & Statistics Seminar Series. Department of Economics at the University of Bergamo, Italy.
[2021] SDS Seminar Series. Department of Statistics and Data Sciences at the University of Texas at Austin, USA (online).

Computer Skills

Statistical Software and Programming Language: R, Python, SAS, STAN, MATHEMATICA.