CURRICULUM VITAE ET STUDIORUM

Alessandra Guglielmi

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Name: Alessandra Guglielmi.

Current position: Full Professor in Statistics at Politecnico di Milano, Department of Mathematics; formerly Associate Professor at Politecnico di Milano (2005-2015), researcher at CNR-IMATI Milano (1996-2005).

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Degree: Bachelor in Science (Mathematics), at Università degli Studi di Milano, Milano (Italy), in 1990.

PhD: in Mathematics, at Università degli Studi di Milano, in 1997.

Invited talks (last 10 years): program *Interpretable Inference via Principled BNP Approaches in Biomedical Research and Beyond*, Institute of Mathematical Sciences, NUS, Singapore, 08 Jul 2024–02 Aug 2024; ISBA 2024, Venice (Italy), 1 - 7 July 2024; EcoSta 2023 (online), Tokyo (Japan), 1-3 August 2023; SIS 2023, 21-23 June 2023, Ancona (Italy) ("invited discussant"); Workshop "Statistical methods for precise medicine", 24 February 2023, Collegio Carlo Alberto, Torino, "Clustering blood donors via mixtures of product partition models with covariates"; ISBA 2022, June 26th - July 1st, Montreal (Canada), "Repulsive mixture models for high-dimensional data"; SIS 2022, 22-24 June 2022, Caserta (Italy), "Repulsive mixture models for high-dimensional data'; CLADAG 2021, virtual conference, 9-11 September 2021; ERCIM 2020, virtual conference, 19-21 December 2020, "The semi-hierarchical Dirichlet process and its application to clustering homogeneous distributions"; ERCIM 2019, 14-16 December 2019, London (UK), "Bayesian nonparametric dynamic clustering: an application to gender stereotypes in words"; ERCIM 2018, 14-16 December 2018, Pisa (Italy), "Clustering and predicting recurrent blood donations via donors' covariates"; IFSS 2018, Grenoble (FRANCE), Sept 6-7, 2018, "Bayesian nonparametric models for clustering individuals with covariates"; ISBA 2018, Edinburgh (UK), June 24-29, 2018, "Bayesian nonparametric covariate-driven clustering: an application to blood donors data"; SIS 2018, Palermo (ITALY), June 20-22, 2018, "Bayesian Nonparametric Learning", con la conferenza "Bayesian nonparametric covariate-driven clustering", and also invited discussant in the "specialized

session" "Young Contributions to Statistical Learning"; "Bayesian Nonparametric Inference: Dependence Structures and their Applications" (17w5060), Oaxaca (MEXICO), Dec 3-8, 2017, "Determinantal point process mixtures with dependence on covariates"; BNP 2017, Paris (FRANCE), June 26-30, 2017, "Statistical analysis of recurrent events for improved health care"; First Italian Meeting on Probability and Mathematical Statistics, Torino (ITALY), June 19-22, 2017, "Bayesian nonparametric covariate-driven clustering"; SISBAYES 2017, 7-8 February 2017, Roma (Italy), ""Bayesian Nonparametrics" (tutorial talk); ERCIM 2016, 9-11 December 2016, Seveille (SPAIN), "Bayesian autoregressive semiparametric models for gap times of recurrent events"; BAYSM 2016, 19-21 June 2016, Florence (ITALY), "The Bayesian nonparametric approach to statistics via exchangeability"; SIS 2016, 8-10 giugno 2016, Salerno (ITALY), "Bayesian autoregressive semiparametric models for gap times of recurrent events"; ICATTG 2015, 29-31 October 2015, Milano, Italy, "Role of OPP in gluacoma: the importance (and correct understanding) of statistical regression models". Reading, UK, 1999 ;

Other recent workshops: SIS 2024; BNP12 (12th Conference on BNP), SIS 2019, ISBA 2016, 10th Conference on BNP 2015, S.Co.2013, 9th Conference on BNP 2013, Bayesian Young Statisticians Meeting 2013, BISP8 2013, Ninth Valencia Meeting 2010, BISP6 2009.

Organized workshops: BNP 14, 23-27 June 2025, UCLA (US); Sessions at CMStatistics 2024, 2023, 2022, Session at ISBA 2022, Session at CLADAG 2021, Session at ISBA 2021 (virtual), Session at CMStatistics 2020 (virtual), Session at CMStatistics 2019 (London, UK), Session at CMStatistics 2018 (Pisa, Italy), ISBA 2018 (Edinburgh, UK), ERCIM 2017 (London, UK), ISBA 2016, S.Co.2013, Milano, 2013; S.Co.2009, Milano, 2009; "Workshop on Probabilistic Methods in Statistics and Physics", Pavia, 2006; Session "Some issues in nonparametric Bayesian modeling" at *ISBA 2004 World Meeting*, 2004, Viña del Mar (Cile); Workshop on Bayesian Nonparametric Statistics, Belgirate (ITALY), 1997.

Recent invited seminars: BNP-ISBA webinar, October 5-th 2022, "BNP clustering using mixtures with interacting atoms" (joint webinar with Mario Beraha); Institute for Statistics and Mathematics, WU Vienna, Wien (Austria), 22 May 2019, title "Determinantal point process mixtures with dependence on covariates"; Pontificia Univesidad Catolica de Chile, Departamento de Estadistica, Santiago de Chile, 10 May 2019, title "Determinantal point process mixtures with dependence on covariates"; Department of Decision Sciences, Università L.Bocconi, 19 May 2016, title "Bayesian nonparametric modeling of multiple time series: an application to recurrent events".

Awards e Partecipazioni a progetti e contratti:

- PI of a Fondazione Cariplo project (2025-2028 - 36 months), *Where to grow a child? Spatial inequalities in ECEC and its impact on women's labour market participation - #GROW.*

- Participation to the project *OUTIP - Out of control. Analysing precarity and its effect on the psychological wellbeing of youth under an intersectional perspective*, *Proyectos de Generación de Conocimiento 2023*, funded by the Minister of Science in Spain.

- Substitute-PI e responsabile dell'unità del Politecnico di Milano di PRIN 2022, *Discrete random structures for Bayesian learning and prediction*, Prot. 2022CL-TYP4.

- Participation to the LIGATE EURO-HPC research project at Politecnico di Milano, from 01/01/2021. Develop Bayesian optimization methods for drug discovery application optimization in HPC clusters.

Associate Editor for Bayesian Analysis (2022-2024, 2025-2027).

Referee (last 3 years) for: *Advances in Data Analysis and Classification (ADAC), Bayesian Analysis, BMC Bioinformatics, Econometrics and Statistics, Journal of the American Statistical Association.*

Visiting professor at: Yale-NUS College, Division of Science, Singapore, Jan-May 2021

Visits for scientific collaboration with colleagues at: UCL, Department of Statistical Science, London (UK), February 2017, June 2017, April 2016 and July 2015; Pontificia Universidad de Chile, Departamento de Estadistica, Santiago de Chile, April 2023, March 2022, May 2019, August-September 2017, November 2016, August-September 2014, November 2012, September 2011 and November 2010; at University of Kent, Canterbury (UK), April 2016 and May 2008; at the Institute of Statistics and Decision Science, Duke University, Durham (NC), USA, January-May 1998 and November 1998.

Membership to statistical societies: IMS, ISBA, SIS.

Service:
- Chair of the Scientific Committee of BNP 14, 23-27 June 2025, UCLA (US)
- Officer (Chair-Elect 2024, Chair 2025, Past Chair 2026) of the Bayesian Nonparametrics Section of ISBA (International Society of Bayesian Analysis);
- Officer (Program Chair) of the Bayesian Nonparametrics Section of ISBA (International Society of Bayesian Analysis), 2020-2021;
- ISBA Board member, 2015-2017;
- Officer of the Bayesian Nonparametrics Section of ISBA (International Society of Bayesian Analysis), 2014-2015;
- Member of Collegio di Dottorato (PhD council) *Mathematical Models and Methods in Engineering*, Politecnico di Milano;
- since 2020 Chair of the School of Industrial and Information Engineering Student-Professor joint committee, which monitors the training offer and the quality of the teaching and student services, identifies indicators for evaluating results and draws up proposals for the improvement of Engineering Programmes;

- from March 2018 I am a member of the Transdisciplinary Unit "Promoting diversity and gender equality in education, science and in a society as a whole: a multi-disciplinary approach", a working unit at Politecnico di Milano which brings together and coordinate activities from the theme and involve expertise from across five departments;

- further duties at Politecnico di Milano.

Research areas: Bayesian nonparametrics; Bayesian clustering; Bayesian spatiotemporal modelling; Bayesian nonparametric mixture models; regression models for reliability/survival analysis; random probability measures and their functionals; Dirichlet processes; exchangeability and partial exchangeability;

Teaching from 2005 in Italian and English: I have experience of lecturing to undergraduate, postgraduate and PhD students in engineering (Mathematical Eng, Biomedical Eng, Computer Eng, Energy Eng, Mechanical Eng). I have experience with e-learning technologies.
I have also taught two courses in Statistics for one semester (aa 2020/2021), major Mathematical, Computational and Statistical Sciences, Yale-NUS College, Singapore.

PhD Advisor:
- Inad Nawajah, PhD in *Mathematical Models and Methods in Engineering*, Politecnico di Milano, 15/07/2014, title of the thesis "Bayesian analysis of Home Care longitudinal data";

- Ilaria Bianchini, PhD in *Mathematical Models and Methods in Engineering*, Politecnico di Milano, 28/02/2018, title of the thesis "Modeling and computational aspects of dependent completely random measures in Bayesian nonparametric statistics";

- Mario Beraha, "Data Science and Computation", cycle XXXIV, Università di Bologna and Politecnico di Milano, title of the thesis "Statistical Learning of Random Probability Measures";

- Matteo Gianella, PhD in *Mathematical Models and Methods in Engineering*, cycle XXXVII, Politecnico di Milano, 04/02/2025, title of the thesis "Bayesian nonparametric analysis of spatial and spatio-temporal data: modelling and computation";

- Michela Frigeri and Alessandro Carminati, PhD "Mathematical Models and Methods in Engineering", cycle XXXVIII, Politecnico di Milano;

- Simone Colombara, PhD "Mathematical Models and Methods in Engineering", cycle XXXIX, Politecnico di Milano;

- Giulio Beltramin, PhD "Mathematical Models and Methods in Engineering", cycle XV, Politecnico di Milano.

Student Thesis supervised: since 2009 I have supervised 8 undergraduate student theses (first level, i.e. bachelor, in Mathematical Eng) and 33 graduate student theses (second level, i.e. MSc, in Mathematical Eng), plus more other theses co-supervised.

PhD thesis examiner: I have acted as an internal and external examiner for PhD examinations.

RECENT PAPERS

Beraha M., Guindani B., Gianella M., Guglielmi A. (2025) BayesMix: Bayesian Mixture Models in C++. *Journal of Statistical Software*, accepted for publication.

Ghilotti, L., Beraha, M., Guglielmi, A. (2024). Bayesian clustering of high-dimensional data via latent repulsive mixtures. *Biometrika*, Advance articles, https://doi.org/10.1093/biomet/asae059

van den Boom W., De Iorio M., Qian F., Guglielmi A. (2024). The Multivariate Bernoulli detector: Change point estimation in discrete survival analysis. *Biometrics*, **80**, ujae075, https://doi.org/10.1093/biomtc/ujae075

Guindani B., Ardagna D., Guglielmi A., Rocco R., Palermo G. (2024). Integrating Bayesian Optimization and Machine Learning for the Optimal Configuration of Cloud Systems. *IEEE Transactions on Cloud Computing*, **12**, 277–294

Argiento R., Corradin R., Guglielmi A., Lanzarone E. (2024). Clustering blood donors via mixtures of product partition models with covariates. *Biometrics*, **80**(1), ujad021

Epifani I., Lanzarone E., Guglielmi A. (2023). Predicting donations and profiling donors in a blood collection center: a Bayesian approach. *Flexible Services and Manufacturing Journal*, Online First Articles, DOI 10.1007/s10696-023-09516-8

Beraha M., Guglielmi A., Quintana F. A., de Iorio M., Eriksson J. G., Yap F. (2023). Childhood Obesity in Singapore: a Bayesian Nonparametric Approach. *Statistical Modelling*, OnlineFirst, DOI 10.1177/1471082X231185892

Aiello L., Fontana M., Guglielmi A. (2023). Bayesian Functional Emulation of CO2 Emissions on Future Climate Change Scenarios. *Environmetrics*, **34**(8), DOI: 10.1002/env.2821

Ren Y., Guglielmi A., Maestripieri L. (2023). Gender Inequalities at Work in Southern Europe. *Metron*, **81**, 297–322.

De Iorio M., Favaro S., Guglielmi A., Ye L. (2023). Bayesian Nonparametric Mixture Modeling for Temporal Dynamics of Gender Stereotypes. *Annals of Applied Statistics*, **17**, No. 3, 2256–2278.

Mozdzen A., Cremaschi A., Cadonna A., Guglielmi A., Kastner G. (2022). Bayesian modeling and clustering for spatio-temporal areal data: an application to Italian unemployment. *Spatial Statistics*, **52**, 100715.

Beraha M., Argiento R., Møller J., Guglielmi A. (2022). MCMC computations for Bayesian mixture models using repulsive point processes. *Journal of Computational and Graphical Statistics*, **31**, 422–435.

Beraha M., Pegoraro M., Peli R., Guglielmi A. (2021). Spatially dependent mixture models via the Logistic Multivariate CAR prior. *Spatial Statistics*, **46**, 100548

Beraha M., Guglielmi A., Quintana, F.A. (2021). The Semi-Hierarchical Dirichlet Process and Its Application to Clustering Homogeneous Distributions. *Bayesian Analysis*, *Bayesian Analysis*, **16**(4), 1187–1219

Messenio D., Babbi A., Guglielmi A., Airaldi M. (2021). Focal electroretinogram and microperimetry testing of photoreceptor-retinal pigment epithelium function in intermediate age-related macular degeneration. *Acta Ophthalmologica*, DOI: 10.1111/aos.14934

Bystrova D., Poggiato G., Bektas B., Arbel J., Clark J. S., Guglielmi A. and Thuiller W. (2021). Clustering species with residual covariance matrix in joint species distribution models. *Frontiers in Ecology and Evolution*, **9**, 1-11, DOI: 10.3389/fevo.2021.601384

Nicoletta V., Guglielmi A., Ruiz A., Belangér V., Lanzarone E. (2022). Bayesian spatio-temporal modelling and prediction of areal demands for ambulance services. *IMA Journal of Management Mathematics*, **33** (1), 101–121

Bianchini I., Guglielmi A., Quintana F.A. (2020). Determinantal point process mixtures via spectral density approach. *Bayesian Analysis*, **15**, 187–214.

Paulon G., De Iorio M., Guglielmi A., Ieva F. (2020). Joint modelling of recurrent events and survival: a Bayesian nonparametric approach. *Biostatistics*, **21**, 1–14

Tallarita M., De Iorio M., Guglielmi A., Malone-Lee J. (2020). Bayesian Autoregressive Frailty Models for Inference in Recurrent Events. *The International Journal of Biostatistics*, **16**, 1–18.

Beraha M., Guglielmi A. (2019). Invited discussion on "Latent nested nonparametric priors" by Camerlenghi F., Dunson D. B., Lijoi A., Prunster I. and Rodríguez A., *Bayesian Analysis*, **14**, 1326–1332.

A. Guglielmi, G. Guidoboni, A. Harris, I. Sartori and L. Torriani (2019). Statistical methods in medicine: application to the study of glaucoma. In *Mathematical Modeling of Ocular Fluid Dynamics. From Theory to Clinical Applications*, Eds: G. Guidoboni, A. Harris, R Sacco, Springer-Birkhäuser, eBook ISBN 978-3-030-25886-3, Hardcover ISBN 978-3-030-25885-6, DOI: 10.1007/978-3-030-25886-3

A. Guglielmi, F. Ieva, A.M. Paganoni, F. A. Quintana (2018). A semiparametric Bayesian joint model for multiple mixed-type outcomes: an application to acute myocardial infarction. *Advances in Data Analysis and Classification*, 12(2), 399-423

R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah (2016). Bayesian joint modeling of the health profile and demand of home care patients. *IMA Journal of Management Mathematics*, **28**, 531–552.

R. Argiento, I. Bianchini, A. Guglielmi (2016). Posterior sampling from epsilon-approximation of normalized completely random measure mixtures. *Electronic Journal of Statistics*, **10**, 3516–3547.

R. Argiento, I. Bianchini, A. Guglielmi (2016). A blocked Gibbs sampler for NGG-mixture models via a priori truncation. *Statistics and Computing*, **26**, 641–661.

R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah (2016). A Bayesian framework for describing and predicting the stochastic demand of home care patients. *Flexible Services and Manufacturing Journal*, **28**, 254–279.

R. Argiento, A. Guglielmi, C.K. Hsiao, F. Ruggeri, C. Wang (2015). Modelling the association between clusters of SNPs and disease responses. In *Nonparametric Bayesian Inference in Biostatistics*, Eds: P. Müller, M. Mitra, Springer, ISBN 978-3-319-19517-9.

RECENT ARTICLES in BOOKS, PROCEEDINGS and TECHNICAL REPORTS

Guindani B., Ardagna D., Guglielmi A. (2024). Bayesian optimization for cloud resource management through machine learning. In *Advanced Methods in Statistics, Data Science and Related Applications*, Eds: M. Bini, A. Balzanella, L. Masserini, R. Verde, Springer Proceedings in Mathematics & Statistics 467, Springer, ISBN 978-3-031-65698-9, DOI: https://doi.org/10.1007/978-3-031-65699-6_24

R. Sala, B. Guindani, D. Ardagna, A. Guglielmi (2024). d-MALIBOO: a Bayesian Optimization framework for dealing with Discrete Variables. *Proceedings of the MASCOTS 2024 Conference*, Krakow, Poland, 2024, pp. 1-8, doi: 10.1109/MASCOTS64422.2024.10786339.

Frigeri M., Marchesin L., Coppellotti M., Guglielmi A. (2024). A Bayesian binomial regression model for ozone levels in Northern Italy. In *SIS 2024, Short Papers, Softcover ISBN 978-3-031-64348-4*

Wolf F., Carminati A., Guglielmi A.(2024). Spatio-temporal clustering of PM2.5 in northern Italy using a Bayesian model. In *SIS 2024, Short Papers, Softcover ISBN 978-3-031-64348-4*

Gianella M., Guglielmi A. (2024). Model-based clustering of spatial time series through the BayesMix library. In *SIS 2024, Short Papers, Softcover ISBN 978-3-031-64348-4*

Frigeri M., Guglielmi A., Lonati G. (2023). A Bayesian weather–driven spatio–temporal model for PM10 in Lombardy. In *Book of Short Papers - SIS 2023 (SEAS IN), Pearson, ISBN 9788891935618*, 1009–1014

Beraha M., Argiento R., Camerlenghi F., Guglielmi A. (2023). Normalized Random Meaures with Interacting Atoms for Bayesian Nonparametric Mixtures. arXiv:2302.09034v1

Guindani B., Ardagna D., Guglielmi A. (2022). Bayesian Optimization with Machine Learning for big data applications in the cloud. In *Book of Short Papers - SIS 2022, Pearson, Eds: A. Balzanella, M. Bini, C. Cavicchia, R. Verde, ISBN: 9788891932310, p. 1479–1484*

Gianella M., Guglielmi A., Lonati G. (2022). A Bayesian spatio–temporal model of PM10 pollutant in the Po Valley. In *Book of Short Papers - SIS 2022, Pearson, Eds: A. Balzanella, M. Bini, C. Cavicchia, R. Verde, ISBN: 9788891932310, p. 883–888*

Ghilotti L., Beraha M., Guglielmi A. (2022). Repulsive mixture models for high-dimensional data. In *Book of Short Papers - SIS 2022, Pearson, Eds: A. Balzanella, M. Bini, C. Cavicchia, R. Verde, ISBN: 9788891932310, p. 32–36*

Guindani B., Ardagna D., Guglielmi A. (2022). MALIBOO: when Machine Learning meets Bayesian Optimization. *Proceedings of the 7th IEEE International Conference on Smart Cloud (IEEE SmartCloud 2022), ISBN: , p. 1–9*, DOI: 10.1109/SmartCloud55982.2022.00008

Guglielmi A., Beraha M., Gianella M., Pegoraro M., Peli R. (2021). A transdimensional MCMC sampler for spatially dependent mixture models. *CLADAG 2021 - Book of abstracts and short papers, Firenze University Press, Eds: G. C. Porzio, C. Rampichini, C. Bocci, ISSN 2704-5846 (ONLINE)*

Ghilotti L., Beraha M., Guglielmi A. (2021). Anisotropic determinantal point processes and their application in Bayesian mixtures. In *Book of Short Papers - SIS 2021, Pearson, Eds: C. Perna, N. Salvati, F. Schirripa Spagnolo, ISBN: 9788891927361, p. 1226–1231*

Gianella M., Beraha M., Guglielmi A. (2021). Spatially dependent mixture models with a random number of components. In *Book of Short Papers - SIS 2021, Pearson, Eds: C. Perna, N. Salvati, F. Schirripa Spagnolo, ISBN: 9788891927361, p. 936–941*

For the complete list of my publications, see

https://guglielmi.faculty.polimi.it/