CURRICULUM VITAE ET STUDIORUM

Alessandra Guglielmi

Last update: December 2021

Name: Alessandra Guglielmi.

Birthplace and birthdate: Isernia (Italy), 22-th August 1967.

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).

Address: Politecnico di Milano, Department of Mathematics
piazza Leonardo da Vinci, 32 - 20133 Milano, Italy
phone +39 02 23994641, fax +39 02 23994513

E-mail: alessandra.guglielmi@polimi.it

Web page: `http://www1.mate.polimi.it/∼guglielmi/`

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: ISBA 2022; 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"; ERCIM 2014, 6-8 dicembre 2014, Pisa (Italy), "Bayesian principal curve clustering by NGG-mixture models"; SIS 2014, 11-13 June 2014, Cagliari (Italy), "A Bayesian nonparametric model for density and cluster estimation: the ε-NGG process mixture"; ERCIM 2013, 14-16 December 2013, London, UK, "Cluster analysis of curved-shaped data with species-sampling mixture models"; 7th International Workshop on Simulation, 21-25 May 2013, Rimini, ITALY: "A Bayesian nonparametric mixture model for cluster analysis"; 7th Workshop on Bayesian Nonparametrics, Moncalieri (TO), ITALY, 2009; *Isaac Newton Institute for Mathematical Sciences Workshop* "Construction and Properties of Bayesian Nonparametric Regression Models", Cambridge (UK), 2007; "The fourth Workshop on BAYESIAN NONPARAMETRICS: Methodology, Theory and Applications", Roma, 2004; "Nonparametric density estimation and regression: from theory to applications" session at "ISBA 2004 World Meeting", Viña del Mar (Cile); invited talk at the Centre de Mathematiques et Informatique, Universite de Provence, Marseille (FRANCE), 2003; Workshop on Bayesian Nonparametric Statistics, Reading, UK, 1999 ; invited talk at ISDS, Duke University (USA), 1998; "discussant" at the meeting Progetto Strategico CNR 1997 "Decisioni statistiche: Teoria e Applicazioni", Roma (ITALY), 1997; Conference on Bayesian Nonparametrics, Belgirate (ITALY), 1997.

Other recent workshops: 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: Session at ISBA 2022, Session at CLADAG 2021, Session at ISBA 2021 (virtual), Session at ERCIM 2020 (virtual), Session at ERCIM 2019 (London, UK), Session at ERCIM 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: 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, il 19 May 2016, title "Bayesian nonparametric modeling of multiple time series: an application to recurrent events".

Referee (last 3 years) for: *Bayesian Analysis*, *Biostatistics*, *Econometrics and Statistics*, *Journal of the American Statistical Association*,

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, 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.

Visiting professor at Yale-NUS College, Division of Science, Singapore, 18 January 2021 - 31 May 2021

Membership to statistical societies: IMS, ISBA, SIS.

Service:
- 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;
- 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;
- 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;
- further duties at Politecnico di Milano.

Research areas: Bayesian nonparametrics; Bayesian clustering; Bayesian generalized linear mixed models; Bayesian nonparametric mixing models; regression models for reliability/survival analysis; random probability measures and their functionals; Dirichlet processes; exchangeability and partial exchangeability; Markov chains with general state space; Bayesian model selection; Bayesian robustness; finitely additive probability measures.

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, PhD "Data Science and Computation", XXXIV ciclo, Università di Bologna and Politecnico di Milano;
- Matteo Gianella, PhD "Mathematical Models and Methods in Engineering", XXXVII ciclo, Politecnico di Milano.

Student Thesis supervised: since 2009 I have supervised 8 undergraduate student theses (first level, i.e. bachelor, in Mathematical Eng) and 30 graduate student theses (second level, i.e. MSc, in Mathematical Eng), plus more other theses co-supervised. Currently I am supervising 1 student from the second level in Mathematical Engineering. The typical graduate thesis duration of my students is 8-12 months.

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

RECENT PAPERS

Beraha M., Argiento R., Møller J., Guglielmi A. (2021). MCMC computations for Bayesian mixture models using repulsive point processes. *Journal of Computational and Graphical Statistics*, Latest Articles, DOI: 10.1080/10618600.2021.2000424

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*, Advance publication, 1–33, DOI: https://doi.org/10.1214/21-BA1278

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. (2021). Bayesian spatio-temporal modelling and prediction of areal demands for ambulance services. *IMA Journal of Management Mathematics*, Advance Access, DOI: 10.1093/imaman/dpaa028

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.

A. Guglielmi, F. Ieva, A. M. Paganoni, F. Ruggeri, J. Soriano (2014). Semiparametric Bayesian models for clustering and classification in presence of unbalanced in-hospital survival. *Journal of the Royal Statistical Society, C (Applied Statistics)*, **63**, 25–46.

R. Argiento, A. Cremaschi, A. Guglielmi (2014). A "Density-Based" Algorithm for Cluster Analysis Using Species Sampling Gaussian Mixture Models. *Journal of Computational and Graphical Statistics*, **23**, 1126–1142.

R. Argiento, A. Guglielmi, A. Pievatolo (2014). Estimation, prediction and interpretation of NGG random effects models. *Statistical Papers*, **55**, 805–826.

R. Argiento, A. Guglielmi, J. Soriano (2013). A semiparametric Bayesian generalized linear mixed model for the reliability of Kevlar fibres. *Applied Stochastic Models in Business and Industry*, **29**, 410–423.

A. Guglielmi, F. Ieva, A. M. Paganoni, F. Ruggeri (2013). Hospital clustering in the treatment of acute myocardial infarction patients via a Bayesian semiparametric approach. In *Statistical Models for Data Analysis,* Eds: P. Giudici, S. Ingrassia, M. Vichi, Springer, p. 141-149.

M. A. Di Lucca, A. Guglielmi, P. Müller and F. A. Quintana (2013). A simple class of Bayesian nonparametric autoregression models. *Bayesian Analysis*, **8**, 63–88.

RECENT ARTICLES in PROCEEDINGS and TECHNICAL REPORTS

Beraha M., Falco D., Guglielmi A. (2021). JAGS, NIMBLE, Stan: a detailed comparison among Bayesian MCMC software. arXiv:2107.09357v1

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*

Beraha M., Pegoraro M., Peli R., Guglielmi A. (2020). A Bayesian model to induce dependence between mixtures. In *Book of Short Papers - SIS 2020, Pearson, Eds: A. Pollice, N. Salvati, F. Schirripa Spagnolo, ISBN: 9788891910776, p. 608–613*

Beraha M., Gualtieri G., Villa E., Vitali R. and Guglielmi A. (2020). Choosing the right tool for the job: a systematic analysis of general purpose MCMC software. In *Book of Short Papers - SIS 2020, Pearson, Eds: A. Pollice, N. Salvati, F. Schirripa Spagnolo, ISBN: 9788891910776, p. 661–666*

De Iorio M., Favaro S., Guglielmi A., Ye L. (2019). Bayesian nonparametric temporal dynamic clustering via autoregressive Dirichlet priors. arXiv:1910.10443

A. Cadonna, A. Cremaschi, A. Guglielmi (2019). Bayesian modeling for large spatio-temporal data: an application to mobile networks. In *Book of Short Papers SIS 2019, Pearson, Eds: G. Arbia, S. Peluso, A. Pini, G. Rivellini, ISBN: 9788891915108, p. 691-696*

G. Bissoli, C. Principi, G.M. Rinaldi, M. Beraha, A. Guglielmi (2019). A Bayesian model for network flow data: an application to BikeMi trips. In *Book of Short Papers SIS 2019, Pearson, Eds: G. Arbia, S. Peluso, A. Pini, G. Rivellini, ISBN: 9788891915108, p. 673-678*

For the complete list of my publications, see

`http://www1.mate.polimi.it/~guglielmi/Research/papers.html`