

# Sonia Petrone

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Decision Sciences and Business Analytics

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## Curriculum Vitae

Laurea cum laude in Economic and Social Sciences from Università Bocconi.

PhD in Statistics, Università di Trento (1989).

### Academic position and/or Professional activities

Full Professor of Decision Sciences

Sonia Petrone is Full Professor of Statistics at Bocconi University, Milano, and Director of the PhD in Statistics at Bocconi.

Member of Evaluation Committee for Human Resources (2013-2016), Bocconi Univ. Member of University Research Council (2012), Bocconi. Vice-director and curricula director, PhD in Statistics, Bocconi Univ. (2004-2011). Previously at University of Insubria (1998-2001) and University of Pavia (1991-1998). She has conducted research in several universities and research institutions abroad, including Stanford University, Cornell University, University of Washington, Duke University, Institute for Mathematics and its Applications-University of Minnesota, Indian Statistical Institute, Russian Academy of Science, Pontificia Universidad Católica de Chile.

Professional and editorial service.

Co-Editor, Bayesian Analysis, 2010-2014. Associate Editor, Statistical Science, 2014-2016.

President Elect (2013), President (2014), Past President (2015) of the International Society for Bayesian Analysis.

Institute of Mathematical Statistics (IMS): Elected member of the IMS Council, 2011-2014. Member (01/2011-09/2012) and Chair (10/2012-07/2014), IMS Committee on Travel Awards.

International Society for Bayesian Analysis (ISBA): Member of ISBA Board of Directors (2002-2004 and 2008-2010). Constitution and Bylaws Committee member (2012-2017); Chair (2015) and member (2009) of de Groot Prize Committee; Chair (2012) and member (2010) of Savage Award Committee.

Project evaluator and referee: National Science Foundation (USA); Netherlands Organization for Scientific Research (NWO); Conicyt (Chile); Milano Univ.; Padova Univ.

Member of the scientific and organizing committee of numerous international scientific meetings and research programs, including the series of workshops on "Bayesian Nonparametrics" (BNP) and "Bayesian Inference for Stochastic Processes" (BISP).

Prize for Excellence in Research, Bocconi University (2002, 2003 and 2009-2010; 2011-2012; 2013-2014; 2015-2016). Lindley Prize 2010, with S. Wade and S. Mongelluzzo.

## Research Interests

- Bayesian Statistics -- foundations, methods, applications
- Bayesian nonparametrics
- Mixtures and latent variable models
- Methods and models for prediction
- State space models

## Publications

- Fortini, S. and Petrone, S. (2015). Predictive Characterization of Mixtures of Markov Chains. Bernoulli, to appear.
- Fortini, S. and Petrone, S. (2015). Predictive distribution: de Finetti's view. Wiley StatsRef-Statistics Reference Online.
- Petrone, S., Rousseau, J. and Scricciolo, C. (2014). Bayes and Empirical Bayes: do they merge?. Biometrika, 101, 285-302.
- Wade, S.K., Dunson, D.B., Petrone, S. and Trippa, L. (2014). Improving Prediction from Dirichlet Process Mixtures via Enrichment. Journal of Machine Learning Research, 15, 1041-1071.
- Petrone, S., Rizzelli, S., Rousseau, J., Scricciolo, C. (2014). Empirical Bayes methods in classical and Bayesian inference. METRON, 72, 201-215.
- Wade, S., Walker, S. and Petrone, S. (2014). A Predictive Study of Dirichlet Process Mixture Models for Curve Fitting. Scandinavian Journal of Statistics, 41, 580-605.
- Fortini, S. and Petrone, S. (2012). Hierarchical Reinforced Urn Processes. Statistics and Probability Letters, 82, 1521-1529.
- Fortini, S. and Petrone, S. (2012). Predictive construction of priors in Bayesian nonparametrics. Brazilian Journal of Probability and Statistics, 26, 423-449.
- Petris, G. and Petrone, S. (2011) State space models in R. Journal of Statistical Software.
- Wade, S., Mongelluzzo, S. and Petrone, S. (2010). Enriched conjugate priors for Bayesian nonparametric inference. Bayesian Analysis, 6, 359-386.
- Petrone, S., Guindani, M. and Gelfand, A.E. (2009) "Hybrid Dirichlet mixture models for functional data", Journal Royal Statistical Society, Ser. B, 71, 755-782.
- Petris, G., Petrone, S. and Campagnoli, P. (2009) Dynamic linear models with R, Springer, N.Y.
- Trippa, L., Bulla, P. and Petrone, S. (2011) "Extended Bernstein prior via reinforced urn processes", Annals of the Institute of Statistical Mathematics, 63, 481-469 (online 2009).
- Petrone, S. and Veronese, P. "Feller operators and mixture priors in Bayesian nonparametrics" (Statistica Sinica, 2010, 20, 379-404).
- N.L.Hjort and Petrone, S. (2007) "Nonparametric quantile inference with Dirichlet processes", in: Advances in Statistical Modeling and Inference. Essays in Honor of Kjell A Doksum, V. Nair Ed., 463-492.
- A.E. Gelfand, M. Guindani and Petrone, S. (2007) "Bayesian nonparametric modelling for spatial data using Dirichlet processes" (with discussion), in: Bayesian Statistics 8, J.M. Bernardo, J.O. Berger, Dawid, A.P. and A.F.M. Smith Eds, Oxford University Press.
- Petrone, S. (2007) Discussion on "Approximating interval hypothesis: p-values and Bayes factors", by J. Rousseau; in: Bayesian Statistics 8, J.M. Bernardo, J.O. Berger, Dawid, A.P. and A.F.M. Smith Eds., Oxford University Press.
- Petrone, S. (2003) "A predictive point of view on Bayesian nonparametrics"; in: Highly Structured Stochastic Systems, P. Green, N. Hjort and S. Richardson Eds, Oxford University Press.
- Petrone, S. and Wasserman, L. (2002) Consistency of Bernstein Polynomial Density Estimators, Journal of the Royal Statistical Society, Ser. B, 64, 79-100; Petrone, S. and Veronese, P. (2002) Non Parametric Mixture Priors Based on an Exponential Random Scheme, Statistical Methods and Applications, 11, 1-20.
- Campagnoli, P., Muliere, P. and Petrone, S. (2001) Generalized Dynamic Linear Models for Financial Time Series, Applied Stochastic Models in Business and Industry, 17, 27-39; Petrone, S. and Corielli, F. (2005) Dynamic Regression Using Bernstein Polynomials with Application to Estimation of the Term Structure of Interest Rates Studi Statistici 61, IMQ, Università Bocconi; Petrone, S. (1999) Random Bernstein Polynomials, Scandinavian Journal of Statistics, 26, 373-393; Petrone, S. (1999) Bayesian Density Estimation Using Bernstein Polynomials, Canadian Journal of Statistics, 27, 105-126; Petrone, S. (1999) Discussion on "Bayesian nonparametric inference for random distributions and related functions", by

Walker, S.G., Damien, P., Laud, P.W., Smith, A.F.M., *Journal of the Royal Statistics Society, Ser. B*, 61, 522-523. Petrone, S., Roberts, G.O. and Rosenthal, J.S. (1999) A Note on Convergence Rates of Gibbs Sampling for Nonparametric Mixtures, *Far East Journal of Theoretical Statistics*, 3, 213-225; Petrone, S. and Raftery, A.E. (1997) A Note on the Dirichlet Process Prior in Bayesian Nonparametric Inference with Partial Exchangeability, *Statistics and Probability Letters*, 36, 69-83. Mira, A. and Petrone, S. (1996) Bayesian Hierarchical Nonparametric Inference for Change-point Problems; in: J.M. Bernardo, J.O. Berger, A.P. Dawid, A.F.M. Smith (eds.), *Bayesian Statistics 5*, Oxford University Press, 693-703. Muliere, P. and Petrone, S. (1993) A Bayesian predictive approach to sequential searching for an optimal dose: parametric and nonparametric models, *Journal of the Italian Statistical Society*, 3, 349-364. Muliere, P. and Petrone, S. (1992) Generalized Lorenz curve and monotone dependence orderings, *Metron*, L, 19-38.