Curriculum vitae - Stefano Favaro

Contact

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Academic positions

2014 -	Associate Professor of Statistics, Università di Torino
2008 - 2014	Assistant Professor of Statistics, Università di Torino
2013 -	Adjunct Faculty, Ph.D. in Statistics, Università Commerciale "L. Bocconi"
2010 -	Research Affiliate, "de Castro" Statistics Initiative, Collegio Carlo Alberto
2010 -	Adjunct Faculty, Allievi Honors Program, Collegio Carlo Alberto
2010 -	Carlo Alberto Affiliate, Collegio Carlo Alberto

Education

2009	Ph.D. in Statistics, Università Commerciale "L. Bocconi" Thesis: *Contributions to the Dirichlet process and related classes of random probability measures* Supervisor: Prof. Stephen G. Walker, University of Texas at Austin
2003	Laurea *cum laude* in Statistics, Università "Ca' Foscari" Venezia Thesis: *Bayesian dynamic generalized linear models for Gamma-type distributions* Supervisor: Prof. Stefano F. Tonellato, Università "Ca' Foscari" Venezia

Research interests

Bayesian nonparametrics, combinatorial stochastic processes with applications to ecological and biological sciences, enumerative combinatorics, large and moderate deviations, Markov chains on graphs, Monte Carlo and Markov Chain Monte Carlo methods, population genetics, random probability measures and their mean functionals, stochastic equations and perpetuities.

Publications

1. Main publications
   - On the stick-breaking representation for homogeneous NRMIs, with A. Lijoi, B. Nipoti, I. Prünster and Y.W. Teh. *Bayesian Analysis*, under revision.
   - Bayesian regularization of the length of memory in reversible sequences, with S. Bacallado and L. Trippa. *Journal of the Royal Statistical Society Series B*, under revision.
   - On a class of sigma-stable Poisson-Kingman models and an effective marginalized sampler, with M. Lomeli and Y.W. Teh. *Statistics and Computing*, to appear.
   - On the stick-breaking representation of sigma-stable Poisson-Kingman models, with M. Lomeli, B. Nipoti and Y.W. Teh. *Electronic Journal of Statistics*, 2014. Volume 8, pages 1063-1085.
   - Large deviation principles for the Ewens-Pitman sampling model, with S. Feng, *The Annals of Applied Probability*, under revision.
   - A marginal sampler for sigma-stable Poisson-Kingman mixture models, with M. Lomeli and Y.W. Teh. *Journal of Computational and Graphical Statistics*, under revision.
   - Looking-backward probabilities for Gibbs-type exchangeable random partitions, with S. Bacallado and L. Trippa. *Bernoulli*, 2015, to appear.
   - Asymptotics for the number of blocks in a conditional Ewens-Pitman sampling model, with S. Feng. *Electronic Journal of Probability*, 2014. Volume 19, pages 1-15.
   - Bayesian nonparametric analysis of reversible Markov chains, with S. Bacallado and L. Trippa. *The Annals of Statistics*, 2013. Volume 41, pages 870-896.
   - Posterior analysis of rare variants in Gibbs-type species sampling models, with O. Cesari and B. Nipoti. *Journal of Multivariate Analysis*, 2014. Volume 131, pages 79-98.
   - MCMC for normalized random measure mixture models, with Y.W. Teh, *Statistical Science*, 2013. Volume 28, pages 335-359.
   - Conditional formulae for Gibbs-type exchangeable random partitions, with A. Lijoi and I. Prünster. *The Annals of Applied Probability*, 2013. Volume 23, pages 1721-1754.
   - Slice sampling sigma-stable Poisson-Kingman mixture models, with S.G. Walker. *Journal of Computational and Graphical Statistics*, 2013. Volume 22, pages 830-847.
   - Alpha-diversity processes and normalized inverse Gaussian diffusions, with M. Ruggiero and S.G. Walker. *The Annals of Applied Probability,* 2013. Volume 23, pages 386-425.
   - A new estimator of the discovery probability, with A. Lijoi and I. Prünster. *Biometrics*, 2012. Volume 68, pages 1188-1196.
   - Asymptotics for a Bayesian nonparametric estimator of species richness, with A. Lijoi and I. Prünster. *Bernoulli*, 2012. Volume 18, pages 1267-1283.
   - On the stick-breaking representation of normalized inverse Gaussian priors, with A. Lijoi and I. Prünster. *Biometrika*, 2012. Volume 99, pages 663-674.

- A class of normalized random measures with an exact predictive sampling scheme, with L. Trippa. *Scandinavian Journal of Statistics*, 2012. Volume 39, pages 444-460.
- A class of measure-valued Markov chains and Bayesian nonparametrics, with A. Guglielmi and S.G. Walker. *Bernoulli*, 2012. Volume 18, pages 1002-1030.
- On a generalized Chu-Vandermonde identity, with I. Prünster and S.G. Walker. *Statistics and Probability Letters*, 2012. Volume 14, pages 253-262.
- On a class of distributions on the simplex, with G. Hadjicharalambous and I. Prünster. *Journal of Statistical Planning and Inference*, 2011. Volume 141, pages 2987-3004.
- On a class of random probability measures with a general predictive structure, with I. Prünster and S.G. Walker. *Scandinavian Journal of Statistics*. Volume 38, pages, 359-376.
- A class of neutral to the right priors induced by superposition of beta processes, with P. De Blasi and P. Muliere. *Journal of Statistical Planning and Inference*, 2010. Volume 140, pages 1563-1575.
- On the distribution of sums of exponential random variables via Wilk's integral representation, with S.G. Walker. *Acta Applicandae Mathematicae*, 2010. Volume 109, pages 1035-1042.
- Bayesian nonparametric inference for species variety with a two parameter Poisson-Dirichlet process prior, with A. Lijoi, R.H. Mena and I. Prünster. *Journal of the Royal Statistical Society Seris B*, 2009. Volume 171, pages 993-1008.
- A Gibbs-sampler based random process in Bayesian nonparametrics, with M. Ruggiero and S.G. Walker. *Electronic Journal of Statistics*, 2009. Volume 3, pages 1557-1567.
- A generalized constructive definition for the Dirichlet process, with S.G. Walker. *Statistics and Probability Letters*, 2008. Volume 78, pages 2836-2838.

2. Conference proceedings, posters and other publications
- Discussion of "On simulation and properties of stable law" by L. Devroye and L.F. James, with B. Nipoti. *Statistical Methods and Applications*, 2014. Volume 23, pages 365-369.
- Bayesian nonparametric inference for shared species richness in multiple populations, with S. Bacallado and L. Trippa. *Journal of Statistical Planning and Inference - Special Issue on Bayesian nonparametrics*, to appear.
- Are Gibbs-type priors the most natural generalization of the Dirichlet process?, with P. De Blasi, A. Lijoi, R.H. Mena, I. Prünster and M. Ruggiero. *IEEE Transactions on Pattern Analysis and Machine Intelligence - Special Issue on Bayesian nonparametrics*, to appear.
- Uncertainty quantification for Bayesian nonparametric estimators of rare species variety, with B. Nipoti. In *Proceedings of the 47th Scientific meeting of the Italian Statistical Society*, 2014.
- Stick-breaking representations of 1/2-stable Poisson-Kingman models, with M. Lomeli, B. Nipoti and Y.W. Teh. In *Proceedings of the 8th Conference on Statistical Computing and Complex Systems*, 2013.

- On the mean functionals of two parameter Poisson-Dirichlet processes, with A. Lijoi and I. Prünster. Poster at the *9th Conference on Bayesian Nonparametrics,* 2013.
- Marginal sampler for sigma-stable Poisson-Kingman mixture models, with M. Lomeli and Y.W. Teh. Poster at the *9th Conference on Bayesian Nonparametric*, 2013.
- Two tales about Bayesian nonparametric modelling, with P. De Blasi, A. Lijoi, R.H. Mena and I. Prünster. In *JSM Proceedings 2012,* Section on Bayesian Statistical Sciences. Alexandria, VA: American Statistical Association, 2012.
- Bayesian nonparametric inference of populations admixtures, with M. De Iorio and Y.W. Teh. Poster at the *International Society of Bayesian Analysis World Meeting,* 2012.
- On some issues related to species sampling problems, with A. Lijoi, R.H. Mena and I. Prünster. In *Proceedings of the 7th Conference on Statistical Computing and Complex Systems,* 2011.
- Contributions to the Dirichlet process and related classes of random probability measures. *Ph.D. Thesis in Statistics,* Dipartimento di Scienze delle Decisioni, Università Commerciale "L. Bocconi", 2009.
- Superposition of beta processes, with P. De Blasi and P. Muliere. In *Proceedings of the 6th Conference on Statistical Computing and Complex Systems,* 2009.
- Genetic approaches for data clustering, with S. Paterlini and T. Minerva. In *Proceeding of the 3rd Scientific Meeting of the Classification and Data Analysis Group,* 2001.

3. Submitted papers
   - Reinforced urn processes indexed by the vertices of a recombinant binary tree, with D. Ait Aoudia and P. Muliere. Submitted, 2010.
   - Random variate generation for Laguerre-type exponentially tilted alpha-stable distributions, with B. Nipoti and Y.W. Teh. Submitted, 2014.
   - Rediscovery of Good-Turing estimators via Bayesian nonparametrics, with B. Nipoti and Y.W. Teh. Submitted, 2014.
   - Modelling population structure with hierarchical Dirichlet processes, with M. De Iorio, T. Elliott and Y.W. Teh. Submitted, 2014.

Conferences, seminars and visiting positions

- Harvard University, Department of Biostatistics and Computational Biology (*visiting scholar, invited by Prof. Lorenzo Trippa*), Boston, USA, 2015.
- McMaster University, Department of Mathematics and Statistics (*visiting scholar, invited by Prof. Shui Feng*), Hamilton, Ontario, Canada, 2014.
- Winter Meeting of the Canadian Mathematical Society (*invited talk*), Hamilton, Ontario, Canada, 2014.
- Bayesian nonparametric workshop at Orleans (*invited talk*), Université d'Orléans, Orléans, France, 2014.
- University of Oxford, Department of Statistics (*visiting scholar, invited by Prof. Yee Whye Teh*), Oxford, United Kingdom, 2014.

- University of Oxford, Department of Statistics (*invited seminar*), Oxford, United Kingdom, 2014.
- IV MCMSki Conference (*invited talk*), Chamonix Mont-Blanc, France 2014.
- 6th International Conference on Computing and Statistics (*invited talk*), London,
- United Kingdom, 2013.
- Workshop on Random Measures and Measure-Valued Processes (*invited talk*), Banff International Research Station, Canada, 2013.
- University College of London, Department of Statistical Sciences (*visiting scholar, invited by Prof. Yee Whye Teh*), London, United Kingdom, 2013.
- 29th European Meeting of Statisticians (*invited talk*), Budapest, Hungary, 2013.
- 9th Workshop on Bayesian Nonparametrics (*poster*), Amsterdam, Netherlands 2013.
- 8th Workshop on Bayesian Inference in Stochastic Processes (*poster*), Milan, Italy, 2013.
- Politecnico di Torino, Department of Mathematics (*invited seminar*), Turin, Italy, 2013.
- 1st Conference on "The Impact of Statistical Thinking in Economics and Life Science" (*invited talk*), Università Commerciale "L. Bocconi", Milan, Italy, 2012.
- International Society of Bayesian Analysis World Meeting (*invited talk*), Kyoto, Japan, 2012.
- 1st Conference of the International Society for Nonparametric Statistics (*invited talk*), Chalkidiki, Greece, 2012.
- University College of London, Department of Statistical Sciences (*visiting scholar, invited by Prof. Maria De Iorio and Prof. Yee Whye Teh*), London, United Kingdom, 2012.
- Università Commerciale "L. Bocconi", Department of Decision Sciences (*invited seminar*), Milan, Italy, 2012.
- 4th International Conference on Computing and Statistics (*invited talk*), London, United Kingdom, 2011.
- 7th Conference on Statistical Computation and Complex Systems (*invited discussant*), Padua, Italy, 2011.
- XIX Congresso dell'Unione Matematica Italiana (*contributed talk*), Bologna, Italy, 2011.
- 8th Research program in Bayesian Nonparametrics (*visiting scholar, invited by the scientific committees of the 8th Workshop on Bayesian Nonparametrics*), Veracruz, Mexico, 2011.
- 8th Workshop on Bayesian Nonparametrics (*invited talk*), Veracruz, Mexico, 2011.
- Universidad Nacional Autonoma del Mexico, Departamento de Probabilidad y Estadistica (*visiting scholar, invited by Prof. R.H. Mena*), Mexico City, Mexico, 2010.
- Harvard University, Department of Biostatistics and Computational Biology (*visiting scholar, invited by Prof. Lorenzo Trippa*), Boston, USA, 2010.
- Università "Ca' Foscari", Department of Statistics (*invited seminar*), Venice, Italy, 2010.

- 3rd International Conference on Computing and Statistics (*invited talk*), London, United Kingdom, 2010.
- Università degli studi di Pavia, Department of Mathematics "F. Casorati" (*invited seminar*), Pavia, Italy, 2010.
- 6th Workshop on Bayesian Inference in Stochastic Processes (*invited talk*), Bressanone, Italy, 2009.
- 27th European Meeting of Statisticians (*contributed talk*), Toulouse, France, 2009.
- Imperial College, Department of Mathematics (*invited seminar*), London, United
- Kingdom, 2008.
- University of Cambridge, Department of Mathematics and Mathematical Statistics
- (*invited seminar*), Cambridge, United Kingdom, 2008.
- Isaac Newton Institute - Construction and properties of Bayesian nonparametric regression models (*visiting scholar, invited by Prof. Stephen G. Walker*), Cambridge, United Kingdom, 2007.

Research funding

- Co-investigator of the European Research Council (ERC) project *New Direction in Bayesian Nonparametrics*. Research team: P. De Blasi, S. Favaro, A. Lijoi, I. Prünster (principal investigator) and M. Ruggiero.
- Co-investigator of the Carlo Alberto research project *New approaches to Stochastic Modelling in Economics via Bayesian Nonparametrics*. Principal investigator: Igor Prünster.
- Co-investigator of the research project *Stochastic4Policy* founded by Regione Piemonte. Coordinator: Igor Prünster.
- Co-investigator of the national research project (PRIN 2008) *Bayesian nonparametric inference and limit theorems for dependent data*. National coordinator: Eugenio Regazzini.
- Scholarship funded by Università Commerciale "L. Bocconi", Milan, Italy (2008 - 2009).

Editorial activity

Referee for: *AISTAT, Annals of Applied Probability, Bayesian Analysis, Bernoulli, Biometrical Journal, Biometrika, Canadian Journal of Statistics, Computational Statistics and Data Analysis, Electronic Journal of Statistics, Journal of Machine Learning Research, Journal of Multivariate Analysis, Journal of Nonparametric Statistics, Journal of the Royal Statistical Society Series B, Sankhya A, Scandinavian Journal of Statistics, Statistical Methods and Applications, Statistics and Probability Letters, Statistics and Computing.*

Society membership

Member of: Institute of Mathematical Statistics, International Society for Bayesian Analysis, Italian Statistical Society.

Events organization

- Organizing committee member, *1st Carlo Alberto Stochastic Workshop*, Collegio Carlo Alberto, 2010.
- Local organizing committee member, *Carlo Alberto Research Programme in Bayesian Nonparametrics*, Collegio Carlo Alberto, 2009.
- Local organizing committee member, *7th Workshop on Bayesian Nonparametrics*, Collegio Carlo Alberto, 2009.

Teaching

1. Academic years 2014/2015 - 2010/2011
   - *Numerical and Statistical Methods for Finance - statistics [42 hours]*, Laurea Magistrale in Economics, Università di Torino.
   - *Numerical and Statistical Methods for Finance - numerical methods [22 hours]*, Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino.
   - *Tutorials in Discrete Mathematics [20 hours]*, Allievi Honors Program, Collegio Carlo Alberto.
   - Tutor of mathematics and statistics, Allievi Honors Program, Collegio Carlo Alberto

2. Academic year 2009/2010
   - *Numerical and Statistical Methods for Finance - statistics [42 hours]*, Laurea Magistrale in Economics, Università di Torino.
   - *Mathematics for Finance [22 hours]*, Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino.
   - *Tutorials in Discrete Mathematics [20 hours]*, Allievi Honors Program, Collegio Carlo Alberto.
   - Tutor of mathematics and statistics, Allievi Honors Program, Collegio Carlo Alberto.

3. Academic year 2008/2009
   - *Stochastic Processes [20 hours]*, Ph.D. in Statistics and Applied Mathematics, Università di Torino.

Current and former students

1. Undergraduate
   - Marco Griffa, thesis: *MCMC using Hamiltonian dynamics - the No-U-Turn sampler*. Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino. Completion expected in March 2015.
   - Gabriella Allione, thesis: *Generalized exponentially tilted alpha-stable distributions*. Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino. Completion expected in March 2015.
   - Marco Prestifilippo, thesis: *Exact sampling for exponentially tilted alpha-stable distributions*. Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino, 2014.
   - Giorgio Melon, thesis: *Approximate Bayesian computation*. Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino, 2014.

- Stefania Bellino, thesis: *The stick-breaking representation for a 1/2-stable Poisson-Kingman process prior*. Laurea Magistrale in Quantitative Finance and Insurance, Università di Torino, 2013.
- Pierluigi Capaldo, thesis: *The Ewens-Pitman sampling formula in Bayesian nonparametric inference for species variates*. Laurea Magistrale in Finance and Insurance, Università di Torino, 2012.
- Oriana Cesari, thesis: *The posterior distribution of rare variants in Gibbs-type species sampling models*. Laurea Magistrale in Finance and Insurance, Università di Torino, 2012.

2. <u>Graduate</u>
- Marco Battiston, topics: *Bayesian nonparametrics, Markov chain Monte Carlo methods,multi-armed bandit problems*. Ph.D. in Statistics, Università Commerciale "L. Bocconi". Jointly supervised with Prof. Yee Whye Teh, University of Oxford.
- Maria Lomeli, topics: *Bayesian nonparametrics, Markov chain Monte Carlo, mixture models, stick-breaking priors*. Ph.D. in Machine Learning, Universtiy College London. Jointly supervised with Prof. Yee Whye Teh, University of Oxford.