

Curriculum Vitae - Stefano Favaro

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Academics

2023 - IMS Fellow, *Institute of Mathematical Statistics*
2023 - Chief Research Officer, DataLab-Algorithms, *Collegio Carlo Alberto*
2019 - Carlo Alberto Chair of Statistics and Machine Learning, *Collegio Carlo Alberto*
2019 - Professor of Statistics, *Università di Torino*
2019 - 2024 ERC Consolidator-grant Fellow, *European Research Council*
2019 - Faculty member, Allievi Honors Program, *Collegio Carlo Alberto*
2018 - Research Fellow, *CNR-IMATI "Enrico Magenes"*
2017 - Faculty member, PhD in Modeling and Data Science, *Università di Torino*
2017 - 2022 Associate Member, Department of Statistics, *University of Oxford*
2016 - 2019 Carlo Alberto Fellow, *Collegio Carlo Alberto*
2014 - 2018 Associate Professor of Statistics, *Università di Torino*
2013 - 2016 Faculty member, PhD in Statistics, *Università Bocconi di Milano*
2012 - 2018 ERC Starting-grant Fellow, *European Research Council*
2010 - 2016 Carlo Alberto Affiliate, *Collegio Carlo Alberto*
2008 - 2014 Assistant Professor of Statistics, *Università di Torino*

Education

2009 PhD in Statistics, *Università Bocconi di Milano*
Thesis: *Contributions to the Dirichlet process and classes of random measures*
Supervisor: Professor Stephen G. Walker, University of Texas at Austin

2003 Degree in Statistics with honors, *Università Ca' Foscari di Venezia*
Thesis: *Bayesian dynamic generalized linear models for Gamma-type distributions*
Supervisor: Professor Stefano F. Tonellato, *Università Ca' Foscari di Venezia*

Research interests

Bayesian nonparametrics and nonparametric empirical Bayes methods; central/local limit theorems and large deviations; combinatorial stochastic processes with applications to biological and physical sciences; conformal (predictive) inference; lossy and lossless compression techniques; disclosure risk assessment and differential privacy; enumerative combinatorics and mean-type inequalities; frequentist validation of Bayesian procedures (Bayesian consistency); learning augmented recovery algorithms; Markov chains on graphs; mathematical population genetics; mathematical aspects of Bayesian deep learning; minimax procedures, Monte Carlo methods; natural language processing; random probability measures and mean functionals; sequential statistical procedures for streaming (online) data; statistical fairness and bias; stochastic equations and perpetuities; stochastic multi-armed bandits.

Publications

1. Main publications

- Quantitative central limit theorems in deep neural networks, with B. Hanin, D. Marinucci, I. Nourdin and G. Peccati. *Probability Theory and Related Fields* (revision submitted).
- Random measure priors in Bayesian recovery from sketches, with M. Beraha and M. Sesia. *Journal of Machine Learning Research*, 2024. Vol. **25**, pp. 1-53.
- Large-width asymptotics and training dynamics for alpha-Stable ReLU neural networks. *Journal of Machine Learning Research* (revision submitted).
- The power of private likelihood-ratio tests for goodness-of-fit in frequency tables, with E. Dolera. *Bernoulli* (revision submitted).
- Bayesian nonparametric inference for “species sampling” problems, with C. Balocchi and Z. Nault. *Statistical Science* (revision submitted).
- MCMC for Bayesian nonparametric mixture modeling under differential privacy, with M. Beraha and V. Rao. *Journal of Computational and Graphical Statistics* (revision submitted).
- Preconditioned Crank-Nicolson algorithms for Bayesian wide neural networks, with L. Pezzetti and S. Peluchetti. *Advances in Neural Information Processing Systems*, 2024.
- A martingale approach to Gaussian fluctuations and laws of iterated logarithm for Ewens-Pitman model, with B. Bercu. *Stochastic Processes and their Applications*, to appear.
- On second-order Poincaré inequalities in non-asymptotic approximation of Gaussian neural networks, with A. Bordino and S. Fortini. *Advances in Approximate Bayesian Inference*, 2024.
- Wasserstein posterior contraction rates in non-dominated Bayesian nonparametric models, with E. Dolera and E. Mainini. *Annales de l'Institut Henri Poincaré - Probabilités et Statistiques*, to appear.
- Scaled process prior for Bayesian nonparametric estimation of the unseen genetic variation, with T. Broderick, F. Camerlenghi and L. Masoero. *Journal of the American Statistical Association*, 2024. Vol. **119**, pp. 320-331.
- Strong posterior contraction rates via Wasserstein dynamics, with E. Dolera and E. Mainini. *Probability Theory and Related Fields*, 2024. Vol. **189**, pp. 659-720.
- A Bayesian nonparametric approach to species sampling problems with ordering, with C. Balocchi and F. Camerlenghi. *Bayesian Analysis*, to appear.

- Bayesian nonparametric mixture modeling for temporal dynamics of gender stereotypes, with M. De Iorio, A. Guglielmi and Y. Lifeng. *Annals of Applied Statistics*, Vol. **17**, pp. 2256-2278.
- Near-optimal estimation of the unseen under regularly varying tail populations, with Z. Nault. *Bernoulli*, 2023. Vol. **29**, pp. 3423-3442.
- Conformal frequency estimation using discrete sketched data with coverage for distinct queries, with M. Sesia and E. Dobriban. *Journal of Machine Learning Research*, 2023. Vol. **24**, pp. 1-80.
- Deep stable neural networks: large-width asymptotics and convergence rates, with S. Fortini and S. Peluchetti. *Bernoulli*, 2023. Vol. **29**, pp. 2574-2597.
- Learning-augmented count-min sketches via Bayesian nonparametrics, with E. Dolera and S. Peluchetti. *Journal of Machine Learning Research*, 2023. Vol. **24**, pp. 1-60.
- Conformalized frequency estimation from sketched data, with M. Sesia. *Advances in Neural Information Processing Systems*, 2022.
- Infinite-wide limits for deep Stable neural networks: sublinear, linear and superlinear activation functions, with A. Bordino and S. Fortini. *Transactions of Machine Learning Research*, 2022.
- More for less: predicting and maximizing genetic variant discovery via Bayesian nonparametrics, with T. Broderick, F. Camerlenghi and L. Masoero. *Biometrika*, 2022. Vol. **109**, pp. 17-32.
- Infinite-channel deep Stable convolutional neural networks, with D. Bracale, S. Fortini and S. Peluchetti. *Advances in Neural Information Processing Systems*, 2021.
- Consistent and rate optimal estimation of the missing mass, with F. Ayed, M. Battiston and F. Camerlenghi. *Annales de l'Institut Henri Poincaré - Probabilités et Statistiques*, 2021. Vol. **57**, pp. 1476-1494.
- Bayesian nonparametric disclosure risk assessment, with F. Panero and T. Rigon. *Electronic Journal of Statistics*, 2021. Vol. **15**, pp. 5626-5651.
- Doubly infinite residual neural networks: a diffusion process approach, with S. Peluchetti. *Journal of Machine Learning Research*, 2021. Vol. **22**, pp. 1-48.
- Large-width functional asymptotics for deep Gaussian neural networks, with D. Bracale, S. Fortini and S. Peluchetti. *International Conference on Learning Representations*, 2021.
- A Bayesian nonparametric approach to count-min sketch under power-law data streams, with S. Peluchetti. *International Conference on Artificial Intelligence and Statistics*, 2021.
- Optimal disclosure risk assessment, with F. Camerlenghi, Z. Nault and F. Panero. *Annals of Statistics*, 2021. Vol. **49**, pp. 723-744.
- Upscaling human activity data: an ecological perspective, with M. Formentin, A. Maritan, S. Stivanello, S. Suweis and A. Tovo. *Proceedings of the National Academy of Sciences*, 2021.
- Perfect sampling for posterior hierarchical Pitman-Yor processes, with S. Bacallado and L. Trippa. *Bayesian Analysis*, 2022. Vol. **17**, pp. 685-709.
- Consistent estimation of small masses in feature sampling, with F. Ayed, M. Battiston and F. Camerlenghi. *Journal of Machine Learning Research*, 2021. Vol. **22**, pp. 1-28.
- Stable behaviour of infinitely wide deep neural networks, with S. Fortini and S. Peluchetti. *International Conference on Artificial Intelligence and Statistics*, 2020.

- Infinitely deep neural networks as diffusion processes, with S. Peluchetti. *International Conference on Artificial Intelligence and Statistics*, 2020.
- Nonparametric Bayesian multi-armed bandits for single cells experiment design, with F. Camerlenghi, B. Dimitrascu, F. Ferrari and B. Engelhardt. *Annals of Applied Statistics*, 2020. Vol. **14**, pp. 2003-2019.
- Rates of convergence in de Finetti's representation theorem, and Hausdorff moment problem, with E. Dolera. *Bernoulli*, 2020. Vol. **26**, pp. 1294-1322.
- A Berry-Esseen theorem for Pitman's alpha-diversity, with E. Dolera. *Annals of Applied Probability*, 2020. Vol. **30**, pp. 847-869.
- Approximating predictive probabilities of Gibbs-type random probability measures, with J. Arbel. *Sankhya A*, 2021. Vol. **83**, pp. 496-519.
- Bayesian nonparametric fixed effect latent variable models in microbiome data analysis, with S. Bacallado, C. Huttenhower, B. Ren and L. Trippa. *Annals of Applied Statistics*, 2020. Vol. **14**, pp. 494-517.
- Neural stochastic differential equations: information propagation through the lens of diffusion processes, with S. Peluchetti. *Advances in Neural Information Processing Systems*, 2019.
- A Good-Turing estimator for feature allocation models, with F. Ayed, M. Battiston and F. Camerlenghi. *Electronic Journal of Statistics*, 2019. Vol. **13**, pp. 3775-3804.
- Bayesian nonparametric analysis of Kingman's coalescent, with S. Feng and P.A. Jenkins. *Annales de l'Institut Henri Poincaré - Probabilités et Statistiques*, 2019. Vol. **55**, pp. 1087-1115.
- Modeling population structure with hierarchical Dirichlet processes, with K. Adhikari, M. De Iorio, T. Elliott and Y.W. Teh. *Bayesian Analysis*, 2019. Vol. **14**, pp. 313-339.
- Genomic variety prediction via Bayesian nonparametrics, with T. Broderick, F. Camerlenghi and L. Masoero. *Advances in Approximate Bayesian Inference*, 2019.
- Multi armed bandits for species discovery: a Bayesian nonparametric approach, with M. Battiston and Y.W. Teh. *Journal of the American Statistical Association*, 2018. Vol. **113**, pp. 455-466.
- Dependent generalized Dirichlet priors for the analysis of acute lymphoblastic leukaemia, with W. Barcella, M. De Iorio and G. Rosner. *Biostatistics*, 2018. Vol. **19**, pp. 342-358.
- Moderate deviations for Ewens-Pitman exchangeable random partitions, with S. Feng and F. Gao. *Sankhya A*, 2018. Vol. **80**, pp. 330-341
- A characterization of product form exchangeable feature probability functions, with M. Battiston, D. Roy and Y.W. Teh. *Annals of Applied Probability*, 2018. Vol. **28**, pp. 1423-1448.
- Posterior representations of hierarchical completely random measures in trait allocation models, with T. Broderick, F. Camerlenghi and L. Masoero. *Advances in Neural Information Processing Systems*, 2018.
- On a general Maclaurin's inequality, with S.G. Walker. *Proceedings of the American Mathematical Society*, 2018. Vol. **146**, pp. 175-188.
- "Sufficientness" postulates for Gibbs-type priors and hierarchical generalizations, with M. Battiston, S. Bacallado and L. Trippa. *Statistical Science*, 2017. Vol. **32**, pp. 487-500.

- A marginal sampler for sigma-stable Poisson-Kingman mixture models, with M. Lomeli and Y.W. Teh. *Journal of Computational and Graphical Statistics*, 2017. Vol. **26**, pp. 44-53.
- Bayesian nonparametric inference for discovery probabilities: credible intervals and large sample asymptotics, with J. Arbel, B. Nipoti and Y.W. Teh. *Statistica Sinica*, 2017. Vol. **27**, pp. 839-858.
- Bayesian nonparametric ordination for the analysis of microbial communities, with S. Bacallado, S. Holmes, B. Ren and L. Trippa. *Journal of the American Statistical Association*, 2017. Vol. **112**, pp. 1430-1442.
- Rediscovery of Good-Turing estimators via Bayesian nonparametrics, with B. Nipoti and Y.W. Teh. *Biometrics*, 2016. Vol. **72**, pp. 136-145.
- Frequency of frequencies distributions and size-dependent exchangeable random partitions, with S.G. Walker and M. Zhou. *Journal of the American Statistical Association*, 2017. Vol. **112**, pp. 1623-1635.
- On the stick-breaking representation for homogeneous NRMs, with A. Lijoi, B. Nipoti, I. Prünster and Y.W. Teh. *Bayesian Analysis*, 2016. Vol. **11**, pp. 697-724.
- A note on nonparametric inference for specie variety with Gibbs-type priors, with L.F. James. *Electronic Journal of Statistics*, 2015. Vol. **9**, pp. 2884-2902.
- Relatives of the Ewens sampling formula in Bayesian nonparametrics, with L.F. James. *Statistical Science*, 2016. Vol. **31**, pp. 30-33.
- Large deviation principles for the Ewens-Pitman sampling model, with S. Feng. *Electronic Journal of Probability*, 2015. Vol. **20**, pp. 1-27.
- A hybrid sampler for Poisson-Kingman mixture models, with M. Lomeli and Y.W. Teh. *Advances in Neural Information Processing Systems*, 2015.
- Random variate generation for Laguerre-type exponentially tilted alpha-stable distributions, with B. Nipoti and Y.W. Teh. *Electronic Journal of Statistics*, 2015. Vol. **9**, pp. 1230-1242.
- Looking-backward probabilities for Gibbs-type exchangeable random partitions, with S. Bacallado and L. Trippa. *Bernoulli*, 2015. Vol. **21**, pp. 1-37.
- Bayesian regularization of the length of memory in reversible sequences, with S. Bacallado and L. Trippa. *Journal of the Royal Statistical Society Series B*, 2016. Vol. **78**, pp. 933-946.
- 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. Vol. **8**, pp. 1063-1085.
- Posterior analysis of rare variants in Gibbs-type species sampling models, with O. Cesari and B. Nipoti. *Journal of Multivariate Analysis*, 2014. Vol. **131**, pp. 79-98.
- Asymptotics for the number of blocks in a conditional Ewens-Pitman sampling model, with S. Feng. *Electronic Journal of Probability*, 2014. Vol. **19**, pp. 1-15.
- MCMC for normalized random measure mixture models, with Y.W. Teh, *Statistical Science*, 2013. Vol. **28**, pp. 335-359.
- Conditional formulae for Gibbs-type exchangeable random partitions, with A. Lijoi and I. Prünster. *Annals of Applied Probability*, 2013. Vol. **23**, pp. 1721-1754.
- Slice sampling sigma-stable Poisson-Kingman mixture models, with S.G. Walker. *Journal of Computational and Graphical Statistics*, 2013. Vol. **22**, pp. 830-847.

- Bayesian nonparametric analysis of reversible Markov chains, with S. Bacallado and L. Trippa. *Annals of Statistics*, 2013. Vol. **41**, pp. 870-896.
- Asymptotics for a Bayesian nonparametric estimator of species richness, with A. Lijoi and I. Prünster. *Bernoulli*, 2012. Vol. **18**, pp. 1267-1283.
- A class of normalized random measures with an exact predictive sampling scheme, with L. Trippa. *Scandinavian Journal of Statistics*, 2012. Vol. **39**, pp. 444-460.
- On the stick-breaking representation of normalized inverse Gaussian priors, with A. Lijoi and I. Prünster. *Biometrika*, 2012. Vol. **99**, pp. 663-674.
- A new estimator of the discovery probability, with A. Lijoi and I. Prünster. *Biometrics*, 2012. Vol. **68**, pp. 1188-1196.
- Alpha-diversity processes and normalized inverse Gaussian diffusions, with M. Ruggiero and S.G. Walker. *Annals of Applied Probability*, 2013. Vol. **23**, pp. 386-425.
- A class of measure-valued Markov chains and Bayesian nonparametrics, with A. Guglielmi and S.G. Walker. *Bernoulli*, 2012. Vol. **18**, pp. 1002-1030.
- On a class of random probability measures with a general predictive structure, with I. Prünster and S.G. Walker. *Scandinavian Journal of Statistics*, 2011 Vol. **38**, pp. 359-376.
- 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 Series B*, 2009. Vol. **171**, pp. 993-1008.
- A Gibbs-sampler based random process in Bayesian nonparametrics, with M. Ruggiero and S.G. Walker. *Electronic Journal of Statistics*, 2009. Vol. **3**, pp. 1557-1567.
- A generalized constructive definition for the Dirichlet process, with S.G. Walker. *Statistics and Probability Letters*, 2008. Vol. **78**, pp. 2836-2838.

2. Conference proceedings and other publications

- On Johnson's "sufficientness" postulates for feature sampling models. *Mathematics - A festschrift for Eugenio Regazzini's birthday*, 2021.
- A compound Poisson perspective of Ewens-Pitman sampling models. *Mathematics - A festschrift for Eugenio Regazzini's birthday*, 2021.
- Addendum to "On a general Maclaurin's inequality", with S.G. Walker. *Proceedings of the American Mathematical Society*, 2018.
- Discussion of "Sparse graphs using exchangeable random measures" by F. Caron and E.B. Fox, with M. Battiston. *Journal of the Royal Statistical Society Series B*, 2017.
- On a class of sigma-stable Poisson-Kingman models and an effective marginalized sampler, with M. Lomeli and Y.W. Teh. *Statistics and Computing - Special Issue, MCMSki IV*, 2015.
- 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 Bayesian Nonparametrics*, 2015.
- Bayesian nonparametric inference for shared species richness in multiple populations, with S Bacallado and L. Trippa. *Journal of Statistical Planning and Inference - Special Issue, Bayesian Nonparametrics*, 2015.

- Bayesian inference on population structure: from parametric to nonparametric modeling, with M. De Iorio and Y.W. Teh. In *Nonparametric Bayesian inference in Biostatistics*, 2015.
- Discussion of "On simulation and properties of stable law" by L. Devroye and L.F. James, with B. Nipoti. *Statistical Methods and Applications*, 2014.
- Contributions to the Dirichlet process and related classes of random probability measures. *PhD Thesis in Statistics*, Department of Decision Sciences, Università Bocconi di Milano, 2009.

3. Submitted papers and preprints

- Optimal estimation of high-order missing masses, and the rate-type match problem, with Z. Naulet. *Preprint* (submitted), 2024.
- A quasi-Bayesian sequential approach to deconvolution density estimation, with S. Fortini. *Preprint* (submitted), 2024.
- A smoothed Bayesian approach to frequency recovery from sketched data, with M. Beraha and M. Sesia. *Preprint* (submitted), 2024.
- Function-space MCMC for Bayesian wide neural networks, with L. Pezzetti and S. Peluchetti. *Preprint* (submitted), 2024.
- Student-t processes as infinite-wide limits of posterior Bayesian neural networks, with F. Caporali and D. Trevisan. *Preprint*, 2024.
- Quasi-Bayes empirical Bayes: a sequential approach to the Poisson compound decision problem, with S. Fortini. *Preprint*, 2024.
- Law of large numbers and central limit theorem for Ewens-Pitman model, with C. Contardi and E. Dolera. *Preprint*, 2024.
- Gaussian credible intervals in Bayesian nonparametric estimation of the unseen, with C. Contardi and E. Dolera. *Preprint*, 2024.
- On strong posterior contraction rates for Laplace priors in the white noise model, with E. Dolera and M. Giordano. *Preprint*, 2024.
- Improved prediction of future user activity in online A/B testing, with M. Beraha, L. Masoero and T. Richardson. *Preprint* (submitted), 2024.
- A nonparametric Bayes approach to online activity prediction, with M. Beraha, L. Masoero and T. Richardson. *Preprint* (submitted), 2024.

Conferences, seminars and visiting positions

- Bayesian Nonparametrics World Meeting (*invited talk - keynote*). Los Angeles, 2025.
- Interpretable Inferences via Principled BNP Approaches in Biomedical Research and Beyond (*invited talk*). Singapore, 2024.
- International Society of Bayesian Analysis (ISBA) World Meeting (*invited talk*). Venice, 2024.
- Italian Meeting of Probability and Mathematical Statistics (*invited talk*). Rome, 2024.
- Institute of Mathematical Statistics (IMS) International Conference on Statistics and Data Science (*invited talk*). Lisbon, 2024.
- University of Cambridge, Statistical Laboratory (*invited seminar*). Cambridge, 2024.
- PhD Workshop in Machine Learning and Artificial Intelligence, Politecnico di Torino (*invited seminar*). Turin, 2024.

- CENTAI Institute (*invited talk*). Turin, 2024.
- PhD Workshop in Applied Probability and Statistics, Collegio Carlo Alberto (*invited seminar*). Turin, 2024.
- ELLIS Workshop on Theory, Algorithms and Computation of Modern Learning Systems (*invited talk*). Genoa 2022.
- Institute of Mathematical Statistics (IMS) Annual Meeting (*invited talk*), London 2022.
- University College London, Department of Statistical Sciences (*invited talk*). London, 2021.
- International Conference on Computing and Statistics (*invited talk*). London, 2021.
- London School of Economics, Department of Statistics (*invited talk*), London, 2021.
- Mathematical and Statistical Challenges in Uncertainty Quantification (*invited talk*). Cambridge, 2020.
- London School of Economics, Department of Statistics (*invited talk*). London, 2020.
- Stochastic Meeting at Lunterren (*invited talk - keynote*). Lunterren, 2019.
- International Conference on Computing and Statistics (*invited talk*). London, 2019.
- Smart Statistics for Smart Applications (*invited talk*). Milan, 2019.
- Bayesian Nonparametrics World Meeting (*contributed talk*). Oxford, 2019.
- Journée de Statistique (*keynote talk*). Nancy, 2019.
- Workshop on Bayesian Nonparametrics for Signal and Image Processing (*invited talk*). Bordeaux, 2018.
- CNR-IMATI “Enrico Magenes” (*invited seminar*). Milan, 2018.
- University of Oxford, Department of Statistics (*visiting, Professor Yee Whye Teh*). Oxford, 2018.
- International Society of Bayesian Analysis (ISBA) world meeting (*invited talk*). Edinburgh, 2018.
- University of Oxford, Department of Statistics (*invited seminar*). Oxford, 2018.
- University of Oxford, Department of Statistics (*invited graduate lecture*). Oxford 2018.
- European Meeting of Statisticians (*invited talk*). Helsinki, 2017.
- Bayesian Inference in Stochastic Processes (*contributed talk*). Milan, 2017.
- Bayesian Nonparametrics World Meeting (*contributed talk*). Paris, 2017.
- University of Oxford, Department of Statistics (*visiting, Professor Yee Whye Teh*). Oxford, 2016.
- Meeting of the Italian Statistical Society (*invited talk*). Salerno, 2016.
- University of Oxford, Department of Statistics (*visiting, Professor Yee Whye Teh*). Oxford, 2016.
- International Conference on Computing and Statistics (*contributed talk*). London, 2015.
- Statistics and Demography: the Legacy of Corrado Gini (*contributed talk*). Treviso, 2015.
- Bayesian Nonparametrics World Meeting (*contributed talk*). Raleigh, 2015.
- Harvard University, Department of Biostatistics and Computational Biology (*visiting, Professor Lorenzo Trippa*). Boston, 2015.
- Winter Meeting of the Canadian Mathematical Society (*invited talk*). Hamilton, 2014.
- McMaster University, Department of Mathematics and Statistics (*visiting, Professor Shui Feng*). Hamilton, 2014.
- Bayesian nonparametric workshop at Orleans (*invited talk*). Orléans, 2014.

- University of Oxford, Department of Statistics (*visiting, Professor Yee Whye Teh*). Oxford, 2014.
- University of Oxford, Department of Statistics (*invited seminar*). Oxford, 2014.
- MCMSki Conference (*invited talk*). Chamonix Mont-Blanc, 2014.
- International Conference on Computing and Statistics (*invited talk*). London, 2013.
- Workshop on Random Measures and Measure-Valued Processes (*invited talk*). Banff International Research Station, 2013.
- Gatsby Computational Neuroscience Unit (*visiting, Professor Yee Whye Teh*). London, 2013.
- European Meeting of Statisticians (*invited talk*). Budapest, 2013.
- Bayesian Nonparametrics World Meeting (*contributed talk*). Amsterdam, 2013.
- Workshop on Bayesian Inference in Stochastic Processes (*contributed talk*). Milan, 2013.
- Politecnico di Torino, Department of Mathematics (*invited seminar*). Turin, 2013.
- Conference on “The Impact of Statistical Thinking in Economics and Life Science” (*invited talk*). Milan, 2012
- International Society of Bayesian Analysis (ISBA) world meeting (*invited talk*). Kyoto, 2012.
- Conference of the International Society for Nonparametric Statistics (*invited talk*). Chalkidiki, 2012.
- University College of London, Department of Statistical Sciences Unit (*visiting, Professor Maria De Iorio*). London, 2012.
- Gatsby Computational Neuroscience Unit (*visiting, Professor Yee Whye Teh*). London, 2012.
- Univeristà Bocconi di Milano, Department of Decision Sciences (*invited seminar*). Milan, 2012.
- International Conference on Computing and Statistics (*invited talk*). London, 2011.
- Conference on Statistical Computation and Complex Systems (*invited talk*). Padua, 2011.
- Congresso dell’Unione Matematica Italiana (*contributed talk*). Bologna, 2011.
- Research Program in Bayesian Nonparametrics (*invited talk*). Veracruz, 2011.
- Bayesian Nonparametrics World Meeting (*invited talk*). Veracruz, 2011.
- Universidad Nacional Autonoma del Mexico, Departamento de Probabilidad y Estadistica (*visiting, Professor Ramses Mena*). Mexico City, 2010.
- Harvard University, Department of Biostatistics and Computational Biology (*visiting, Professor Lorenzo Trippa*). Boston, 2010.
- Università Ca’ Foscari di Venezia, Department of Statistics (*invited seminar*). Venice, 2010.
- International Conference on Computing and Statistics (*invited talk*). London, 2010.
- Università di Pavia, Department of Mathematics (*invited seminar*). Pavia, 2010.
- Bayesian Inference in Stochastic Processes (*invited talk*). Bressanone, 2009.
- 27th European Meeting of Statisticians (*contributed talk*). Toulouse, 2009.
- Imperial College, Department of Mathematics (*invited seminar*). London, 2008.
- University of Cambridge, Department of Mathematics and Mathematical Statistics (*invited seminar*). Cambridge 2008.

- Construction and Properties of Bayesian Nonparametric Regression Models (*visiting, Professor Stephen G. Walker*). Cambridge, 2007.

Research funding

1. Projects funded (as principal investigator)

- Principal investigator of the European Research Council (ERC) Consolidator Grant proposal: *Nonparametric Bayes and Empirical Bayes for species sampling problems: classical questions, new directions and related issues*. Starting date March 2019, duration 5 years.

2. Projects funded (as co-investigator)

- Co-investigator of the national research project (PRIN-PNRR 2023) *Measuring Biodiversity via Bayesian Nonparametrics: estimation, clustering and uncertainty quantification*. Principal investigator: Professor Antonio Lijoi.
- Co-investigator of the national research project (PRIN 2023) *Discrete Random Structures for Bayesian Learning and Predictions*. Principal investigator: Professor Igor Prünster.
- Co-investigator of the national research project (PRIN 2016) *Modern Bayesian Nonparametric methods*, Principal investigator: Professor Igor Prünster.
- Co-investigator of the European Research Council (ERC) Starting Grant: *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 Modeling in Economics via Bayesian Nonparametrics*. Principal investigator: Professor Igor Prünster.
- Co-investigator of the national research project (PRIN 2008) *Bayesian nonparametric inference and limit theorems for dependent data*. National coordinator: Professor Eugenio Regazzini.

Editorial activity

Associate Editor: *Bernoulli* (2022 -); *Statistical Science* (2020 -)

Referee for: *AISTAT (Conference on Artificial Intelligence and Statistics)*; *Annals of Applied Probability*; *Annals of Statistics*; *Applied and Computational Harmonic Analysis*; *Bayesian Analysis*; *Bernoulli*; *Biometrika*; *Computational Statistics and Data Analysis*; *Electronic Journal of Probability*; *Electronic Journal of Statistics*; *ICLR (International Conference on Learning Representations)*; *ICML (International Conference on Machine Learning)*; *IEEE Transactions in Information Theory*; *Journal of the American Statistical Association*; *Journal of Machine Learning Research*; *Journal of Multivariate Analysis*; *Applied Probability Trust*; *Journal of Computational and Graphical Statistics*; *Journal of Nonparametric Statistics*; *Journal of the Royal Statistical Society Series B*; *Mathematics*; *NeurIPS (Neural Information Processing Systems)*; *Probability Theory and Related Fields*; *Sankhya A*; *Scandinavian Journal of Statistics*; *Statistical Science*; *Statistics and Probability Letters*; *Statistics and Computing*; *Stochastic Processes and their Applications*.

Membership

American Statistical Association (ASA); European Laboratory for Learning and Intelligent Systems (ELLIS); Institute of Mathematical Statistics (IMS); International Society for Bayesian Analysis - Section Bayesian nonparametrics (ISBA); Società Italiana di Statistica (SIS); Unione Matematica Italiana (UMI).

Events organization

- Session on “*Bayesian Nonparametrics with system constraints*”. Institute of Mathematical Statistics (IMS) International Conference on Statistics and Data Science. Nice, 2024.
- Lecture series on “*Predictive uncertainty in machine learning with conformal inference*”, with Prof. M Sesia. PhD in Modeling and Data Science, Università di Torino. Turin, 2023.
- Lecture series on “*High dimensional probability for mathematicians and data scientists*”, with Prof. L. Goldstein. PhD in Modeling and Data Science, Università di Torino. Turin, 2022.
- Lecture series on “*Topics in information theory*”, with Prof. Y. Rinott. PhD in Modeling and Data Science, Università di Torino. Turin, 2020.
- Seminar series in Statistics at Collegio Carlo Alberto, Turin, 2020, 2021, 2022.
- Session on “*Differential privacy in the dissemination of frequency tables*”. 12th International Conference on Computing and Statistic. London, 2019.
- Session on “*Topics in disclosure risk assessment*”. International Society of Bayesian Analysis (ISBA) world meeting, 2018. Edinburgh, 2018.
- Session on “*Discrete random structures in Bayesian nonparametrics*”. International Society of Bayesian Analysis (ISBA) world meeting, 2016. Cagliari, 2016.
- Organizing committee of “*StaTalk on Bayesian Nonparametrics*”, Collegio Carlo Alberto. Turin, 2010.
- Research in team on “*Random partitions in Bayesian nonparametrics*”, with Prof. Shui Feng. Banff International Research Station, 2016.
- Organizing committee of “*1st Carlo Alberto Stochastic Workshop*”, Collegio Carlo Alberto. Turin, 2010.
- Organizing committee of “*Carlo Alberto Research Programme in Bayesian Nonparametrics*”, Collegio Carlo Alberto. Turin, 2009.
- Organizing committee of “*7th Workshop on Bayesian Nonparametrics*”, Collegio Carlo Alberto. Turin, 2009.

Teaching

1. Academic years 2016/2017 - 2024/2025

- *Numerical and Statistical Methods for Finance - Statistics [48 hours]*, MSc in Economics and MSc in Quantitative Finance and Insurance, Università di Torino.
- *Statistical Inference [72 hours]*, MSc in Stochastics and Data Science, Università di Torino.
- *Tutorials in Discrete Mathematics [24 hours]*, Allievi Honors Program, Collegio Carlo Alberto.
- Tutor of Mathematics and Statistics, Allievi Honors Program, Collegio Carlo Alberto.

2. Academic year 2015/2016

- *Numerical and Statistical Methods for Finance - Statistics [42 hours]*, MSc in Economics and MSc in Quantitative Finance and Insurance, Università di Torino.
- *Numerical and Statistical Methods for Finance - numerical methods [8 hours]*, MSc. in Quantitative Finance and Insurance, Università di Torino.
- *Statistical Inference [50 hours]*, MSc in Stochastics and Data Science, 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 years 2010/2011 - 2014/2015

- *Numerical and Statistical Methods for Finance - Statistics [42 hours]*, MSc in Economics and MSc in Quantitative Finance and Insurance, Università di Torino.
- *Numerical and Statistical Methods for Finance - numerical methods [22 hours]*, MSc 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.

4. Academic year 2009/2010

- *Numerical and Statistical Methods for Finance - Statistics [42 hours]*, MSc in Economics and MSc in Quantitative Finance and Insurance, Università di Torino.
- *Mathematics for Finance [22 hours]*, MSc 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.

5. Academic year 2008/2009

- *Stochastic Processes [20 hours]*, PhD in Statistics and Applied Mathematics, Università di Torino

Current and former students

1. MSc students

- Lucia Pezzetti, thesis: *Function-space MCMC for Bayesian wide neural networks*. MSc in Stochastics and Data Science, Università di Torino, 2023
- Francesco Caporali, thesis: *Student-t processes as infinite-wide limits of posterior Bayesian neural networks*. MSc in Stochastics and Data Science, Università di Torino, 2023.
- Paolo Borrello, thesis: *Second order Poincaré inequalities in Gaussian approximations of deep neural networks*. MSc in Stochastics and Data Science, Università di Torino, 2023
- Filippo Fiocchi, thesis: *Bayesian nonparametric recovery of the number of distinct counts from sketched data*. MSc in Stochastics and Data Science, Università di Torino, 2023.
- Alberto Bordino, thesis: *On stable behaviours of infinitely wide deep neural networks with ReLu activations*. MSc in Stochastics and Data Science, Università di Torino, 2022.
- Rebecca Farina, thesis: *On exact computation with infinitely wide deep Stable neural networks*. MSc in Stochastics and Data Science, Università di Torino, 2022.
- Daniele Bracale, thesis: *Large-width functional asymptotics for deep Gaussian neural networks*. MSc in Stochastics and Data Science, Università di Torino, 2020.
- Luca Benetti, thesis: *Bayesian nonparametric count-min sketch under power data law streams*. MSc in Stochastics and Data Science, Università di Torino, 2020.
- Clara Borio, thesis: *Private goodness of fit testing procedures*. MSc in Quantitative Finance and Insurance, Università di Torino, 2019.

- Matteo Godio, thesis: *A statistical approach to privacy: differentially private and local differentially private hypothesis tests*. MSc in Quantitative Finance and Insurance, Università di Torino, 2019.
- Carlo Scali, thesis: *Estimating the waiting time for discovering new species: a Bayesian nonparametric approach*. MSc in Stochastics and Data Science, Università di Torino, 2019.
- Enrico Maria Belliardo, thesis: *Query optimization: a Bayesian nonparametric approach*. MSc in Stochastics and Data Science, Università di Torino, 2019.
- Simona Palestini, thesis: *A nonparametric approach to query optimization under heavy tails*. MSc in Quantitative Finance and Insurance, Università di Torino, 2018.
- Francesca Panero, thesis: *A nonparametric empirical Bayes approach to disclosure risk assessment*. MSc in Stochastics and Data Science, Università di Torino, 2017.
- Federico Ferrari, thesis: *A nonparametric Thompson sampling algorithm for species discovery*. MSc in Stochastics and Data Science, Università di Torino, 2017.
- Mattia Duma, thesis: *A Bayesian nonparametric analysis of Shakespeare poems*. MSc in Quantitative Finance and Insurance, Università di Torino, 2017.
- Fabrizio Casetta thesis: *Truncated generalized Dirichlet processes*. MSc in Quantitative Finance and Insurance, Università di Torino, 2016.
- Carlo Ascoli, thesis: *Aspects of stochastic mean-field variational inference*. MSc in Quantitative Finance and Insurance, Università di Torino, 2016.
- Marco Griffa, thesis: *MCMC using Hamiltonian dynamics - the No-U-Turn sampler*. MSc in Quantitative Finance and Insurance, Università di Torino, 2015.
- Gabriella Allione, thesis: *Generalized exponentially tilted alpha-stable distributions*. MSc in Quantitative Finance and Insurance, Università di Torino, 2015.
- Marco Prestifilippo, thesis: *Exact sampling for exponentially tilted alpha-stable distributions*. MSc in Quantitative Finance and Insurance, Università di Torino, 2014.
- Giorgio Melon, thesis: *Approximate Bayesian computation*. MSc 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*. MSc in Quantitative Finance and Insurance, Università di Torino, 2013.
- Pierluigi Capaldo, thesis: *The Ewens-Pitman sampling formula in Bayesian nonparametric inference for species variates*. MSc in Finance and Insurance, Università di Torino, 2012.
- Oriana Cesari, thesis: *The posterior distribution of rare variants in Gibbs-type species sampling models*. MSc in Finance and Insurance, Università di Torino, 2012.

2. PhD students

- Claudia Contardi, topics: *Differential privacy in density estimation*. PhD in Mathematics, Università di Pavia. Jointly supervised with Professor Emanuele Dolera, Università di Pavia.
- Lorenzo Masoero, topics: *Bayesian nonparametrics - theory and methods*. PhD in Machine Learning, Massachusetts Institute of Technology. Jointly supervised with Professor Tamara Broderick, Massachusetts Institute of Technology.

- Marco Battiston, topics: *Bayesian nonparametrics - theory and methods*. PhD in Statistics, Università Bocconi di Milano. Jointly supervised with Professor Yee Whye Teh, University of Oxford. Now Lecturer at Lancaster University.
- Boyu Ren, topics: *Bayesian nonparametrics - applications in biology*. PhD in Biostatistics, Harvard University. Jointly supervised with Professor Lorenzo Trippa, Harvard University. Now Postdoctoral Fellow at Harvard University.
- Maria Lomeli, topics: *Bayesian nonparametrics - computation*. PhD in Machine Learning, University College London. Jointly supervised with Professor Yee Whye Teh, University of Oxford. Now Research Scientist at Facebook.

3. Postdoctoral students

- Mario Beraha, topics: *Bayesian nonparametrics - theory and methods*. ERC Postdoctoral Fellow at Università di Torino and Collegio Carlo Alberto.
- Cecilia Balocchi, topics: *Bayesian nonparametrics - theory and methods*. ERC Postdoctoral Fellow at Università di Torino and Collegio Carlo Alberto.

Local administrative duties (in Italian)

1. Academic year 2016/2017 - 2017/2018

- *Presidente della commissione per il test d'accesso ai corsi di laurea triennale*, School of Management and Economics, Università di Torino.
- *Componente della commissione riesame*, MSc in Quantitative Finance and Insurance, Università di Torino.
- *Presidente della commissione riesame*, MSc in Stochastics and Data Science, Università di Torino.
- *Componente della commissione valutazione requisiti minimi*, MSc in Stochastics and Data Science, Università di Torino.
- *Componente del consiglio scientifico di C3S*, Centro di Competenza sul Calcolo Scientifico, Università di Torino

2. Academic year 2015/2016

- *Componente della commissione per il test d'accesso ai corsi di laurea triennale*, School of Management and Economics, Università di Torino
- *Componente della commissione per l'ammissione al Dottorato in Economia "Vilfredo Pareto"*, Università di Torino.
- *Componente della commissione riesame*, MSc in Quantitative Finance and Insurance, Università di Torino.
- *Componente della commissione valutazione requisiti minimi*, MSc in Stochastics and Data Science, Università di Torino.
- *Componente della commissione riesame*, MSc in Stochastics and Data Science, Università di Torino.

3. Academic year 2014/2015

- *Componente della commissione per l'ammissione al Dottorato in Economia "Vilfredo Pareto"*, Università di Torino.
- *Componente della commissione riesame*, MSc in Quantitative Finance and Insurance, Università di Torino.

4. Academic years 2010/2011 - 2013/2014

- *Componente della commissione riesame*, MSc in Quantitative Finance and Insurance, Università di Torino.