

Lorenzo Cappello

CONTACT INFORMATION **Universitat Pompeu Fabra**
Department of Economics and Business
Ramon Trias Fargas, 25-27, Barcelona, Spain, 080055
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<https://lorenzocapp.github.io>

RESEARCH INTERESTS Bayesian Statistics, Population Genetics, Stochastic Approximation, Scalable Inference, Change-Point Detection, Inference in Stochastic Processes, Nonparametrics Statistics, Infectious Diseases.

EDUCATION

Università Commerciale Luigi Bocconi, Milan, Italy February 2018
Ph.D. Statistics
Thesis Topic: *Recursive Procedures for Nonparametric Inference in Multivariate Settings*
Advisor: Stephen G. Walker, Ph.D., University of Texas at Austin
Co- Advisor: Sonia Petrone, Ph.D., Università Commerciale Luigi Bocconi

RSM, Erasmus University, Rotterdam, the Netherlands December 2012
M.S., Finance & Investments

Università degli Studi di Genova, Genoa, Italy July 2010
B.S., Engineering

RESEARCH POSITIONS

Universitat Pompeu Fabra, Barcelona, Spain January 2022 - *present*
Assistant Professor, Department of Economics and Business
Affiliated with Barcelona School of Economics Data Science Centre

Stanford University, Stanford, CA April 2018 - December 2021
Postdoctoral Scholar, Department of Statistics
Mentor: Julia A. Palacios, Ph.D.

University of Texas at Austin, Austin, TX September 2015 - December 2017
Research Fellow, Department of Mathematics
Visiting Research Student, Department of Statistics and Data Science
Mentor: Stephen G. Walker, Ph.D.

Università Commerciale Luigi Bocconi, Milan, Italy September 2013 - February 2018
Research Assistant, Department of Decision Sciences
Mentor: Sonia Petrone, Ph.D.

European Central Bank, Frankfurt, Germany January 2013 - August 2013
Research Trainee, Economic Policy Analysis Division (Oil Price Forecasting Group)
Mentor: Cristiana Manescu, Ph.D.; Nuno Galo, Ph.D.

PUBLISHED
PAPERS

1. **Cappello, L.**, Walker, S. G., (2018) “A Recursive Multivariate Inversion of a Laplace Transform for Probability Distributions.”, *Methodology and Computing in Applied Probability*, 20 777-797
2. Palacios, J. A., Véber, A. , **Cappello, L.**, Wang, Z., Wakeley, J., Ramachandran, S., (2019) “Bayesian Estimation of Population Size Changes by Sampling Tajima’s Tree.” *Genetics*, 213 (3) 967-986
3. **Cappello, L.**, Palacios, J. A., (2020) “Sequential Importance Sampling Algorithms for Multi-Resolution Kingman-Tajima Coalescent Counting.” *Annals of Applied Statistics*, 14 (2) 727-751.
4. **Cappello, L.**, Ghosh, S., Palacios, J. A., (2020) Discussion (Invited) on “Horseshoe-based Bayesian Nonparametric Estimation of Effective Population Size Trajectories.” *Biometrics*, 76 (3) 691-694
5. **Cappello, L.**, Palacios, J. A., (2021) “Adaptive Preferential Sampling in Phylodynamics.” *Journal of Computational and Graphical Statistics*, in Press
6. **Cappello, L.**, Kim, J. , Liu, S. , Palacios, J. A., “Statistical Challenges in Tracking the Evolution of SARS-CoV-2.” *Statistical Science*, in Press

SUBMITTED
PAPERS

1. **Cappello, L.**, Walker, S. G., “Recursive Nonparametric Predictive for a Discrete Regression model.” (SBSS Best Student Paper Prize at JSM 2018, BNP @ Paris 2017 Best Poster Award)
2. **Cappello, L.**, Walker, S. G., “Recursive Estimation of Probability Distributions.”
3. **Cappello, L.**, Véber, A. , Palacios, J. A., “Bayesian Nonparametrics Inference of Population Trajectories via Tajima Heterochronous Coalescent.” arXiv 2004.06826.
4. **Cappello, L.**, Kim, J. , Palacios, J. A., “Bayesian Inference of Dependent Population Dynamics in Coalescent Models.” doi.org/10.1101/2022.05.22.492976.
5. **Cappello, L.**, Padilla, O. M., Palacios, J. A., “Scalable Bayesian Change Point Detection with Spike and Slab Priors.” arXiv:2106.10383
6. Parikh, V. N., Gorzynski, J. E. , De Jong, H. N. , Amar, D., Hughes, C., Ioannidis, A., Bierman, R. Liu, D., Tanigawa, Y., Kistler, A. L., Kamm, J., Neff, N. F., Rubinacci, S., Delaneau, O. , Shoura, M. J. , Seo, K., Kirillova, A. , Raja, A., Sutton, S., Huang, C. , Sahoo, M. K., Mallempati, K. C., Kim, J., **Cappello, L.**, Montero-Martin, G. , Osoegawa, K. , Watson, N., Hammond, N., Joshi, R. , Fernández-Viña, M. A., Christle, J. W. , Wheeler, M.T., Febbo, P., Farh, K. , Schroth, G. P. , DeSouza, F. , Palacios, J.A., Salzman, J. , Pinsky, B. A. , Rivas, M. A. , Bustamante, C.D., Ashley, E. A. , “Deconvoluting Complex Correlates of COVID-19 Severity with Local Ancestry Inference and Viral Phylodynamics: Results of a Multiomic Pandemic Tracking Strategy.” (Minor Review *Nature Communications*)

PAPERS IN
PREPARATION

1. **Cappello, L.**, Walker, S. G., “Bivariate Bayesian Recursive Predictive Distributions.”
2. **Cappello, L.**, Walker, S. G., “Recursive Sampling from a Distribution given its Laplace Transform.”

AWARDS

Young Researchers Travel Award: Bayesian Nonparametrics @ Oxford 2019

Best Student Paper Prize, ASA Section on Bayesian Statistical Science (SBSS):
JSM 2018

Best Poster Award: Bayesian Nonparametrics @ Paris 2017

Research Unit 1735 scholarship: Machine Learning Spring PhD School, Sylt, Germany,
March 2015

Bocconi Full Ph.D. Scholarship: September 2013

PROFESSIONAL SERVICE	Reviewer for: Journal of Times Series Analysis; Molecular Biology and Evolution; Statistical Science; Journal of the American Statistical Association: Systematic Biology.
INVITED PRESENTATIONS	EcoSta 2017 Recursive Nonparametric Predictive for a Discrete Regression Model BISP 2019 Bayesian Nonparametric Inference of Population Trajectories via Tajima Heterochronous Coalescent. Stanford University, Department of Genetics, Pritchard Lab 2020 Tajima Heterochronous n -Coalescent. JSM 2021 Adaptive Preferential Sampling in Phylodynamics. USP Campinas 2021 Scalable Coalescent Models. Universitat Politècnica de Catalunya 2022 An efficient coalescent model for heterochronously sampled data.
CONTRIBUTED PRESENTATIONS	Università Commerciale Luigi Bocconi, 2016 Some Recursive Procedures in Multidimensional Settings (PhD 3rd year presentation) ISBA 2016 (Poster) A Recursive Multivariate Inversion of a Laplace Transform for Probability Distributions BAYSM 2016 (Poster) A Recursive Multivariate Inversion of a Laplace Transform for Probability Distributions BISP 2017 (Poster) On Some Properties of “Bayesian” Recursive Procedures BNP 2017 (Poster) Recursive Nonparametric Predictive for a Discrete Regression Model JSM 2018 Recursive Nonparametric Predictive for a Discrete Regression Model ProbGen 2018 (Poster) Sequential Importance Sampling Algorithms for Multi-Resolution Kingman-Tajima Coalescent Counting. BNP 2019 Bayesian Nonparametric Inference of Population Trajectories via Tajima Heterochronous Coalescent.

Stanford University 2019, Department of Biomedical Data Science (Poster)
Tajima Heterochronous n -Coalescent.

One World Meeting 2020 (Online talk)
Tajima Heterochronous n -Coalescent.

BNP Cyprus 2022 (Online talk)
An efficient coalescent model for heterochronously sampled data.

IMS London 2022
Variance change-point detection with credible sets

TEACHING EXPERIENCE	<p>Instructor Winter 2022 Probability and Statistics (Statistics module) Bachelor in Business and Economics Department of Economics and Business, Universitat Pompeu Fabra</p> <p>Instructor Winter 2022 Probabilistic Inference in Machine Learning Master in Data Science Barcelona School of Economics</p> <p>Teaching Assistant Spring 2015 Time-series Modelling, Statistics for Economics and Business Department of Decision Sciences, Università Commerciale Luigi Bocconi</p>
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REFERENCES	<p>Stephen G. Walker Professor E-mail: s.g.walker@math.utexas.edu Department of Mathematics University of Texas at Austin</p> <p>Julia A. Palacios Assistant Professor E-mail: juliapr@stanford.edu Department of Statistics and Biomedical Data Science Stanford University</p> <p>Sonia Petrone Professor E-mail: sonia.petrone@unibocconi.it Department of Decision Sciences Università Commerciale Luigi Bocconi</p> <p>Amandine Véber Senior Researcher at CNRS E-mail: amandine.veber@parisdescartes.fr Département de Mathématiques Université de Paris</p>
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SKILLS	<p>Computer Programming: MATLAB, R, Python, Unix, Stan</p> <p>Language: Italian, English, Spanish (A2)</p> <p>Typesetting: \LaTeX</p>
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