Lucia Paci

Department of Statistical Sciences
Università Cattolica del Sacro Cuore
Largo Gemelli, 1 - 20123 Milan, Italy

Email: lucia.paci@unicatt.it
Phone: +39 02 72342491
Web: https://luciapaci.github.io/

RESEARCH INTERESTS

Bayesian inference of spatio-temporal modeling, graphical modeling, and mixture modeling, with applications to ecological and environmental processes, social and life sciences.

CURRENT POSITION

Associate Professor in Statistics   May, 2022 - present
Department of Statistical Sciences, Università Cattolica del Sacro Cuore (Milano).

PAST POSITION

Senior Assistant Professor in Statistics   May, 2020 - April, 2022
(Ricercatore SECS-S/01, Legge 240/10 tipo B)
Department of Statistical Sciences, Università Cattolica del Sacro Cuore (Milano).

Junior Assistant Professor in Statistics   December, 2016 - April, 2020
(Ricercatore SECS-S/01, Legge 240/10 tipo A)
Department of Statistical Sciences, Università Cattolica del Sacro Cuore (Milano).

Post-doctoral Research Fellow in Statistics   November, 2013 - October, 2016
Department of Statistical Sciences, University of Bologna.

EDUCATION

Ph.D. in Statistics   January, 2014
Department of Statistical Science, University of Bologna.

M.Sc. in Statistical and Economic Sciences   January, 2010
Faculty of Statistical Science, University of Bologna.

B.Sc. in Statistics, Business and Markets   October, 2007
Faculty of Statistical Science, University of Bologna.

TEACHING

Università Cattolica del Sacro Cuore
Master's degree in Data analytics for business
- Vice-Coordinator of the M.Sc. (since 2020)
- *Applied linear models* (AY 2023/24, 2022/23, 2020/21 - 60 hours)
- Internship, Research assistantship and Field project (AY 2023/24, 2022/23, 2021/22)

Master's degree in Statistical and actuarial sciences
- *Empirical research* (AY 2020/21, 2019/20 - 36 hours, 2018/19 - 24 hours)
- *Statistical modelling* (AY 2017/18 - 30 hours; teaching assistant AY 2019/20, 2018/19, 2016/17)
- Internship, Research assistantship and Project (AY 2020/21, 2019/20, 2018/19)

Bachelor's degree in Economics
- *Statistics* (AY 2023/24, 2022/23 - 60 hours; teaching assistant AY 2021/22, 2019/20, 2018/19, 2017/18)

Master in Data Science for Management
- *Preliminary course in Statistics* (AY 2021, 2020, 2019, 2018, 2017 - 14 hours)

University of Bologna
Master's degree in Statistics
- *Bayesian inference* (teaching assistant AY 2016/17, 2015/16, 2013/14, 2012/13, 2011/12)
- *Principles and Methods of Sampling* (teaching assistant AY 2015/16)

Bachelor's degree in Statistics
- *Survey Sampling* (teaching assistant AY 2015/16, 2014/15)
- *Environmental Statistics* (teaching assistant AY 2015/16)
- *R laboratory* (teaching assistant AY 2014/15)

PhD program
- Course *Statistics for spatio-temporal data* (December 2020 and May 2022 - 15 hours), PhD program in Economics, Statistics and Data Science, University of Milan-Bicocca
- Course *Statistical models for spatio-temporal data* (February 2020 - 14 hours), PhD program in Engineering and applied sciences, University of Bergamo
- Member of the Scientific Committee of the PhD program in Economics and Statistics, University of Milan-Bicocca (since AY 2018/2019 to present)
- Member of the Scientific Committee of the PhD program in Statistics and Mathematics for Finance, University of Milan-Bicocca (AY 2017/18 - 2019/20)

RESEARCH EXPERIENCE

Visiting Scholar   February, 2016 - April, 2016
Facultad de Economía y Empresa, Universidad de Zaragoza.

Research Fellow   October, 2014 - December, 2014
Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, USA.

Visiting Scholar   January, 2012 - November, 2012
Department of Statistical Science, Duke University, Durham, NC, USA.

Research assistant   March, 2010 - July, 2010
Department of Statistical Science, University of Bologna.

PUBLICATIONS

Colombi, A., Argiento, R., Paci, L., Pini, A. (2024) Learning block structured graphs in Gaussian graphical models, *Journal of Computational and Graphical Statistics*, 33, 152-165.

Gasperoni F., Luati A., Paci L., D'Innocenzo E. (2023) Score driven modeling of spatio-temporal data, *Journal of the American Statistical Association*, 118, 1066-107.

Codazzi L., Colombi A., Gianella M., Argiento R., Paci L., Pini A. (2022) Gaussian graphical modeling for spectrometric data analysis, *Computational Statistics & Data Analysis*, 174, 107416.

Paci L., Consonni G. (2020) Structure discovery of contemporaneous dependencies in graphical VAR models, *Computational Statistics & Data Analysis*, 144, 106880.

Paci L., Beamonte M. A., Gelfand A. E., Gargallo P., Salvador M. (2020) Spatial hedonic modeling adjusted for preferential sampling, *Journal of the Royal Statistical Society: Series A*, 183, 169-192.

Finazzi F., Paci L. (2020) Kernel-based estimation of individual location densities from smartphone data. *Statistical Modelling*, 20, 617-633.

Finazzi F., Paci L. (2019) Quantifying personal exposure to air pollution from smartphone-based location data, *Biometrics*, 75, 1356-1366.

Paci L., Finazzi F. (2018) Dynamic model-based clustering for spatio-temporal data, *Statistics and Computing*, 28, 359-374.

Paci L., Beamonte M. A., Gelfand A. E., Gargallo P., Salvador M. (2017) Analysis of residential property sales using space-time point patterns, *Spatial Statistics*, 21, 149-165.

Paci L., Gelfand A.E. , Beamonte M.A., Rodrigues M., Peréz-Cabello F. (2017) Space-time model for post-fire vegetation recovery. *Stochastic Environmental Research and Risk Assessment*, 31, 171-183.

Paci L., Gelfand A. E., Cocchi D. (2015) Quantifying uncertainty for temperature maps derived from computer models. *Spatial Statistics*, 12, 96-108.

Paci L., Gelfand A. E., Holland D. M. (2013) Spatio-temporal modeling for real-time ozone forecasting. *Spatial Statistics*, 4, 79-93.

Bruno, F., Cocchi, D., Paci L. (2013) A practical approach for assessing the effect of grouping in hierarchical spatio-temporal models. *AStA Advances in Statistical Analysis*, 97 (2), 93-108.

Books and chapters in books
Paci L. (2019) Bayesian space-time data fusion for real-time forecasting and map uncertainty, *Best Ph.D. Thesis in Applied Statistics*, Cleup.

Canale A., Durante D., Paci L. Scarpa B. (Edited by) (2018) 'Studies in Neural Data Science', Series Springer Proceedings in Mathematics and Statistics.

Paci L., Trivisano C., Cocchi D. (2018) Multivariate Stochastic Downscaling for Semicontinuous Data. In: Mola F., Conversano C., Vichi M. (Eds) *Classification, (Big) Data Analysis and Statistical Learning. Studies in Classification, Data Analysis, and Knowledge Organization*. Springer, 107-115.

Paci L., Bonafé G., Trivisano C. (2016) Dynamic data fusion approach for air quality assessment. In Steyn D., Chaumerliac N. (Eds) *Air Pollution Modelling and its Application XXIV - Proceedings of ITM 2015*, Springer, 629-633.

Bruno F., Paci L. (2014) Spatio-temporal model for short-term predictions of air pollution data. In Lanzarone E., Ieva F. (Eds) *The contribution of Young Researchers to Bayesian Statistics - Proceedings of BAYSM 2013*, Springer, 91-94.

Pre-prints
Colombi A., Argiento R., Camerlenghi F., Paci L. Mixture modeling via vectors of normalized independent finite point processes, *arXiv:2310.20376*

Argiento R., Filippi-Mazzola E., Paci L., Model-based clustering for categorical data via Hamming distance, *arXiv:2212.04746*.

Aiello, L., Argiento R., Finazzi F., Paci, L. Survival modelling of smartphone trigger data for earthquake parameter estimation in early warning. With applications to 2023 Turkish-Syrian and 2019 Ridgecrest events, *arXiv:2303.00806*.

Peer-reviewed conference proceedings
Colombi A., Argiento R., Camerlenghi F. and Paci L., (2023) Finite mixture model for multiple sample data. In Francesco Maria Chelli F. M., Ciommi M. Ingrassia S., Mariani F., Recchioni M. C. (Eds), Book of the Short Papers 2023, pp 839-843.

Costa Fontichiari P., Giuliani M., Argiento R., Paci L., (2021) Group-dependent finite mixture model. In Porzio G. C., Rampichini C., Bocci C. (Eds), CLADAG 2021 Book of abstracts and short papers, Firenze University Press, pp 304-307.

Filippi-Mazzola E., Argiento R., Paci L., (2021) Clustering categorical data via Hamming distance. In Perna C., Salvati N., Schirripa Spagnolo F. (Eds), Book of short papers SIS 2021, Pearson, pp 752-757.

Codazzi L., Colombi A., Gianella M., Argiento R., Paci L., Pini A., (2020) Functional graphical model for spectrometric data analysis. In Pollice A., Salvati N., Schirripa S. (Eds), Book of short papers SIS 2020, Pearson, pp 852-856.

Finazzi F., Paci L. (2018) A comparison of statistical methods for estimating individual location densities from smartphone data. In Valenzuela O., Rojas F., Pomares H., Rojas I. (Eds), Proceedings of ITISE 2018, pp 1471-1482.

Paci L., Consonni G. (2018) A note on objective Bayes analysis for graphical vector autoregressive models. In Abbruzzo A., Brentari E., Chiodi M., Piacentino D. (Eds), Book of short Papers SIS 2018, Pearson, pp 1580-1585.

Finazzi F., Paci L. (2017) Space-time clustering for identifying population patterns from smartphone data. In Petrucci A., Verde R. (Eds) Proceedings of SIS 2017, Firenze University Press, pp 423-428.

Paci L., Gelfand A.E., Beamonte M.A., Gargallo P., Salvador M. (2016) Bayesian modeling of spatio-temporal point patterns in residential property sales. In Pratesi M., Perna C. (Eds) Proceedings of SIS 2016, pp 1-6.

Cocchi D., Paci L., Trivisano C. (2015) Multivariate downscaling for non-Gaussian data. In Mola F., Conversano C. (Eds) Proceedings of CLADAG 2015, CUEC Editrice, pp 191-194.

Paci L., Cocchi D., Gelfand A.E. (2014) Quantifying uncertainty associated with a numerical model output. In Cabras S., Di Battista T., Racugno W. (Eds) Proceedings of SIS 2014, CUEC Editrice, pp 1-6.

Bruno F., Paci L. (2013) Hierarchical spatio-temporal models for short-term predictions of air pollution data. In Brentari E., Carpita M. (Eds), Advances in Latent Variables - Proceedings of SIS 2013, Vita e Pensiero, pp 1-6.

Bruno F., Paci L. (2011) A comparison between hierarchical spatio-temporal models in presence of spatial homogeneous groups: the case of Ozone in the Emilia-Romagna Region. In Cafarelli B. (Eds), Proceedings of Spatial2, CDP Service Edizioni, pp 1-4.

Software

Finazzi F., Paci L. (2017) *DYSC - DYnamic Spatiotemporal Clustering.* `https://github.com/graspa-group/DYSC`.

Paci L., Bonafé G. (2015) *R-package PESCO*. DOI: 10.5281/zenodo.19829. `https://github.com/jobonaf/pesco`.

Dissemination

Canale A., Durante D., Paci L., Scarpa B. (2018) Connecting statistical brains. *Significance*, 15, pp 38-40.

Amorati R., Deserti M., Minguzzi E., Stortini M., Paci L. (2017) Prevedere per prevenire e gestire le emergenze. *Ecoscienza*, 1, pp 20-21, 2017 (in Italian).

CONFERENCES

Invited presentations

ERCIM 2022. December 17-19, 2022. London. Talk: Block structured Gaussian graphical models for spectrometric functional data

ISBA 2021. June 23 - July 2, 2021. Virtual meeting. Talk: Model-based clustering for categorical data via Hamming distance.

O'BAYES 2019. June 28 - July 2, 2019. Warwick, UK. Plenary talk with discussant: Structural learning of contemporaneous dependencies in graphical VAR models.

ERCIM 2018. December 14-16, 2018. Pisa, Italy. Talk: Quantifying personal exposure to air pollution from smartphone-based location data.

ISBA 2018. June 24-29, 2018. Edinburgh, UK. Talk: Dynamic model-based clustering for spatio-temporal data.

The 26th Annual TIES Conference. July, 18-22, 2016. Edinburgh, UK. Talk: Assessing common spatio-temporal patterns in large environmental datasets.

The 25th Annual TIES Conference. November 22-25, 2015. Al Ain, United Arab Emirates University, UAE. Talk: Space-time modeling for post-fire vegetation recovery.

CLADAG 2015 Conference. October 8-10, 2015. Santa Margherita di Pula, Cagliari, Italy. Talk: Multivariate downscaling for non-Gaussian data.

Workshop on Spatio-temporal modeling and its applications. September 24-25, 2015. Department of Economics, University G. d'Annunzio Chieti-Pescara, Italy. Talk: Joint stochastic modeling for downscaling temperature and precipitation maps.

SIS 2013 Conference: Advances in Latent Variables. Methods, models and applications June 19-21, 2013. Department of Economics and Management, Brescia, Italy. Talk: Hierarchical spatio-temporal models for short-term predictions of air pollution data.

Contributed presentations

COSTNET19 Meeting. October 9-11, 2019. Bilbao, Spain. Talk: Graphical model selection for air quality time series.

GRASPA 2019 Conference. July 15-16, 2019. Pescara, Italy. Poster: Graphical model selection for air quality time series.

COSTNET18 Meeting. September 26-28, 2018. Warsaw, Poland. Talk: Objective Bayes analysis for graphical vector autoregressive models.

SIS 2018 Scientific Meeting. June 20-22, 2018. Palermo, Italy. Poster: A note on objective Bayes analysis for graphical vector autoregressive models.

Workshop on Verification Intercomparison. September 21-23, 2016. ARPAE, Bologna, Italy. Poster: Validation of an air quality probabilistic Bayesian model for Emilia-Romagna.

Bayesian Young Statistician Meeting 2016. June 19-21, 2016. Firenze, Italy. Talk: Dynamic clustering for spatio-temporal data.

SIS 2016 Scientific Meeting. June 8-10, 2016. Salerno, Italy. Talk: Bayesian modeling of spatio-temporal point patterns in residential property sales.

GRASPA 2015 Conference. June 15-16, 2015. Università degli Studi di Bari Aldo Moro, Italy. Poster presentation no. 1: Hierarchical space-time model for post-fire vegetation recovery. Poster presentation no. 2: Joint downscaling of temperature and precipitation.

G70 Conference. April 19-22, 2015. Department of Statistical Science, Duke University, Durham, USA. Poster presentation: Hierarchical space-time model for post-fire vegetation recovery.

SIS 2014 Scientific Meeting. June 11-13, 2014. University of Cagliari, Italy. Talk: Quantifying uncertainty associated with a numerical model output.

Bayesian Young Statistician Meeting 2013. June 5-6, 2013. CNR-IMATI, Milan, Italy. Poster presentation: Spatio-temporal model for short-term predictions of air pollution data.

Spatial Data Methods for Environmental and Ecological Processes, 2nd Edition. September 1-2, 2011. Foggia, Italy. Poster presentation: A comparison between hierarchical spatio-temporal

models in presence of spatial homogeneous groups: the case of Ozone in Emilia-Romagna region.

SEMINARS AND INVITED TALKS

Dept. of Economics, *University di Bergamo*, Italy	May 30, 2022
Dept. of Statistical Sciences, *Warwick University*, UK	May 27, 2022
Dept. of Statistical Sciences, BNP4CD workshop, *University of Padova*, Italy	January 24, 2020
Dept. of Decision Sciences, *Bocconi University*, Italy	June 13, 2019
Dept. of Statistical Sciences, StaTalk @Unibo, *University of Bologna*, Italy	March 29, 2019
Connecting Things and Data with Google, *Google Milan*, Italy	April 12, 2018
Dept. of Statistical Sciences, *University of Padova*, Italy	October 14, 2016
ARPA-SIMC Emilia Romagna, Italy,	May 20, 2014
Dept. of Statistical Sciences, StEPhI workshop, *University of Bologna*, Italy,	February 6, 2013
Dept. of Statistical Science, STATMOS Meeting, *Duke University*, USA,	April 12, 2012
Applied Bayesian Statistic School, *EURAC*, Italy	June 20-24, 2011

AWARDS

National Scientific Qualification for Associate professor in Statistics (Abilitazione Scientifica Nazionale a professore di II fascia, settore 13/D1), from 20/12/2019 to 20/12/2028.

High quality publication award, Università Cattolica del Sacro Cuore, 2022.

High quality publication award, Università Cattolica del Sacro Cuore, 2021.

High quality publication award, Università Cattolica del Sacro Cuore, 2019.

Best PhD Thesis in Applied Statistics, Italian Statistical Society, 2016.

Best poster award, GRASPA, 2015.

G70 Young Investigator Travel award, Duke University, 2015.

SAMSI Research Fellowship, 2014.

Marco Polo Mobility Scholarship, University of Bologna, 2011 and 2015.

FUNDING

Member of the research project PRIN2022 "Complex graphical models for biological network science", funded by the Italian Ministry of Universities and Research , PI: Francesco Stingo (University of Florence). 2022-2025

Member of the research project "Towards more Earthquake-resilient Urban Societies through a Multi-sensor-based Information System enabling Earthquake Forecasting, Early Warning and Rapid Response actions" (TURNkey), funded by EU Framework Programme Horizon 2020, PI: Francesco Finazzi (University of Bergamo). 2020-2022

Member of the research project "Real-time Earthquake Risk Reduction for a Resilient Europe" (RISE), funded by EU Framework Programme Horizon 2020, PI: Francesco Finazzi (University of Bergamo). 2020-2022

Member of the COST Action (CA15109) "European Cooperation for Statistics of Network Data Science" (COSTNET), funded by EU Framework Programme Horizon 2020, PI: Ernst Wit (Università della Svizzera italiana). 2018-2020

Member of the research project PRIN 2015 "Environmental processes and human activities: capturing their interactions via statistical methods" (EphaStat), funded by the Italian Ministry of Education, Universities, and Research, PI: Daniela Cocchi (University of Bologna). 2016-2020

Member of the research project FIRB 2012 "Statistical modeling of environmental phenomena: pollution, meteorology, health and their interactions" (StEPhI), funded by the Italian Ministry of Education, Universities, and Research, PI: Francesca Bruno (University of Bologna). 2013-2016

OTHER ACADEMIC ACTIVITIES

Member of the Board of Directors of ISBA from 2024 to 2026.

Associate Editor of *Statistical methods & applications*, from 2024.

Member of the ISBA Prize Committee from 2023 to 2026.

Member of the Scientific Committee of SIS 2023, June 21-23, 2023, Ancona, Italy.

Elected Treasurer of the section on Environmental Sciences of the International Society for Bayesian Analysis (EnviBayes) from 2022 to 2024.

Member of the Local Organizing Committee of SIS 2019, June 19-21, 2019, Milan, Italy.

Member of the Reference Committee of SUS[5], June 18, 2019, Milan, Italy.

Joint Organizer of the meeting 'Start up Research - Follow up', June 19, 2018, Palermo, Italy.

Co-Organizer of the invited session 'Young contribution to statistical learning' at SIS 2018 Conference, June 20-22, 2018, Palermo, Italy.

Chair of the Scientific Committee of the SIS School on 'Data Science on digital unstructured data', September 1-8-15-22-29, 2017, Milan, Italy.

Member of the Scientific Committee of SIS 2017 Conference, June 28-30 2017, Florence, Italy.

Chair of the Scientific Committee and the Organizing Committee of Start up Research workshop, June 25-27 2017, Certosa di Pontignano, Siena, Italy.

Member of the Local Organizing Committee of TIES-GRASPA 2017 Conference, July 24-26 2017, Bergamo, Italy.

Member of the Scientific Committee of GRASPA 2015 Conference, June 15-16 2015, Bari, Italy.

Elected Program Chair of the junior section of the International Society for Bayesian Analysis (j-ISBA) from January 2016 to December 2017.

Elected member of the Board of the young section of the Italian Statistical Society (y-SIS) from January 2015 to December 2016.

Referee for: Advances in Data Analysis and Classification; Computational Statistics & Data Analysis; Environmentrics; Journal of Agricultural, Biological, and Environmental Statistics; Journal of Royal Statistical Society - Series A; Journal of Royal Statistical Society - Series C; Journal of Statistical Computation and Simulation; Journal of Statistical Software; IMA Journal of Management Mathematics; Metron; Spatial statistics; Statistical Methods in Medical Research; Statistical methods and applications; Statistics and Probability Letters; Statistical Science; Stochastic Environmental Research and Risk Assessment.

AFFILIATIONS

International Society for Bayesian Analysis (ISBA); Italian Statistical Society (SIS); Research Group for Statistical Applications to Environmental Problems (GRASPA).

Milan, January 2024