Cristian Castiglione

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Research interests

Bayesian Statistics, Computational Statistics, Spatial Statistics, Mixed and Additive Models.

Current position

Postdoctoral research fellow — Milan, Italy
Bocconi University, Bocconi Institute for Data Science and Analytics (BIDSA) — Apr 2025 – Mar 2026
Project: *sociogeNEsis of criMinal nEtworks: reconStruction, dIscovery and diSruption (NEMESIS)* – ERC Grant
Advisor: Prof. Daniele Durante

Postdoctoral research fellow — Milan, Italy
Bocconi University, Bocconi Institute for Data Science and Analytics (BIDSA) — Apr 2024 – Mar 2025
Project: *Causes of deAth dependence stRuctures and the cOmpositioNal effecT on ovErall mortality (CARONTE)* – PRIN–MIUR Grant
Advisor: Prof. Daniele Durante

Past academic positions

Postdoctoral research fellow — Padua, Italy
University of Padua, Department of Statistical Sciences — Feb 2023 – Apr 2024
Project: *Statistical methods and models for the integration of multiomic data*
Advisor: Prof. Davide Risso

Education

Ph.D. **University of Padua**, Department of Statistical Sciences — Padua, Italy
Course: Statistical Sciences — Oct 2019 – May 2023
Thesis: *Approximate inference for misspecified additive and mixed models*
Advisors: Prof. Mauro Bernardi
Co-advisors: Prof. Laura M. Sangalli, Prof. Alessio Farcomeni

M.S. **University of Padua**, Department of Statistical Sciences — Padua, Italy
Course: Statistical Sciences — Oct 2016 – Nov 2018
Thesis: *Dynamic quantile models for spatio-temporal data*
Advisor: Prof. Mauro Bernardi
Final mark: 110/110 cum Laude

B.S. **University of Padua**, Department of Statistical Sciences — Padua, Italy
Course: Statistics, Economics and Finance — Oct 2013 – Jul 2016
Thesis: *Multistate models for competing risks*
Advisor: Prof. Giuliana Cortese
Final mark: 110/110

Work experience

Blue BI S.R.L., Junior consultant in business intelligence and analytics — Vicenza, Italy
Jan 2019 - Sep 2019

Awards and fundings

Member of the ERC grant: *sociogeNEsis of criMinal nEtworks: reconStruction, dIscovery and diSruption (NEMESIS)*, ID: , Principal investigator: Daniele Durante — 2025 – Present

Member of the PRIN grant: *Causes of deAth dependence stRuctures and the cOmpositioNal effecT on ovErall mortality (CARONTE)*, ID: , Principal investigator: Daniele Durante — 2024 – Present

Member of the PRIN grant: *Complex Graphical Models for Biological Networks*, ID: , Principal investigator: Alberto Roverato — 2023 – Present

Merit-based Ph.D. fellowship, Department of Statistical Sciences, University of Padova — Padova, Italy, 2019 – 2023

ISBA travel award at *ISBA 2022 world meeting*. — Montreal, Canada, Jun 2019

Best Report Prize at *Stats Under the Stars 3 (SuS3)*. — Florence, Italy, Jun 2019

Skills and technologies

Languages: Italian (native), English (good)

Programming: R (advances), Python (advanced), Julia (advanced), C++ (advances), Matlab (basic)

Database: MySQL (basic)

Markup: LaTeX (advanced)

Pubblications

Published articles

Castiglione, C., Arnone, E., Bernardi, M., Farcomeni, A., Sangalli, L.M. (2024)
PDE-regularised spatial quantile regression.
Journal of Multivariate Analysis, 205, 105381 (link)

Sottosanti, A., Risso, D., **Castiglione, C.** (2022)
Contributed discussion: "Bayesian Nonstationary and Nonparametric Covariance Estimation for Large Spatial Data" by Kidd B. and Katzfuss M.
Bayesian Analysis, 17(1): 337–339. (link)

Manuscripts

Castiglione, C., Bernardi, M. (2022)
Bayesian non-conjugate regression via variational message.
arxiv.org/abs/2206.09444 (under review)

Castiglione, C., Segers, A., Clement, L. and Risso, D. (2024)
Stochastic gradient descent estimation of generalized matrix factorization models with application to single-cell RNA sequencing data.
arxiv.org/abs/2412.20509 (submitted)

Di Battista I., De Sanctis M.F., Arnone E., **Castiglione C.**, Palummo A., Sangalli L.M. (2025+)
A semiparametric space-time quantile regression model.
(under review)

De Sanctis M.F., Di Battista I., Arnone E., **Castiglione C.**, Palummo A., Bernardi M., Ieva F., Sangalli L.M. (2025+)
Exploring nitrogen dioxide spatial concentration via physics-informed multiple quantile regression.
(under review)

Conference proceedings

De Sanctis, M.F., Di Battista, I., Arnone, E., **Castiglione, C.**, Bernardi, M., Palummo, A., Sangalli, Laura.M. (2024).
Penalised Spatial Quantile Regression: Application to Air Quality Data.
Book of Short Papers 2024, Proceedings of the 53rd Scientific Meeting of the Italian Statistical Society, pp. 532–537.

Castiglione, C., Arnone, E., Bernardi, M., Farcomeni, A., Sangalli, L. M. (2023).
Penalized quantile regression for spatially distributed data.
Book of Short Papers GRASPA 2023, Proceedings of the GRASPA 2023 Conference, pp. 124–129.

Castiglione, C., Bernardi, M. (2022).
Probabilistic load forecasting via dynamic quantile regression.
Book of Short Papers IWSM 2022, Proceedings of the 36th International Workshop on Statistical Modelling, pp. 400–405.

Castiglione, C., Bernardi, M. (2022).
Sparse signal extraction via variational SVM.
Book of Short Papers SIS 2022, Proceedings of the 51th Scientific Meeting of the Italian Statistical Society, pp. 864–870.

Castiglione, C., Bernardi, M. (2021).
Semiparametric variational inference for Bayesian quantile regression.
Book of Short Papers SIS 2021, Proceedings of the 50th Scientific Meeting of the Italian Statistical Society, pp. 683–688.

Ongoing projects

Romanò G., **Castiglione C.**, Durante D. (2025+).
Dynamic stochastic block models for sequences of directed networks: an application to US causes of death.

Castiglione C., Maestrini L., Bernardi M. (2025+).
On frequentist variational inference for generalized additive models.

Bianco N., **Castiglione C.** (2025+).
Improving Bayesian semi-parametric regression via increasing shrinkage priors.

Conference presentations

Castiglione, C., Romanò, G., Durante, D. (2024).
Dynamic stochastic block models with application to causes of death networks. (invited presentation)
18th International Joint Conference CFE-CMStatistics 2024, London, UK, 14–16 December.

Castiglione, C., Bianco, N. (2024).
Improving Bayesian semiparametric regression via increasing shrinkage priors. (poster presentation)
2024 World Meeting of the International Society for Bayesian Analysis (ISBA 2024), Venice, Italy, 1–7 July.

Castiglione, C., Arnone, E., Bernardi, M., Farcomeni, A., Sangalli, L. M. (2024).
A flexible framework for spatial quantile regression via PDE regularization. (invited presentation)
International Symposium on Nonparametric Statistics (ISNPS 2024), Braga, Portugal, 25–29 July.

Castiglione, C., Bianco, N. (2023).
Increasing shrinkage in Bayesian nonparametric regression for differential expression analysis. (poster presentation)
2023 IMS International Conference on Statistics and Data Science (ICSDS 2023), Lisbon, Portugal, 11–14 November.

Castiglione, C., Arnone, E., Bernardi, M., Farcomeni, A., Sangalli, L. M. (2023).
Penalized quantile regression for spatially distributed data. (poster presentation)
Biennial conference of the Italian research group for Environmental Statistics (GRASPA 2023), Palermo, Italy, 10–11 July.

Castiglione, C., Bernardi, M. (2023).
Approximate belief updating via semiparametric variational Bayes. (poster presentation)
Greek stochastics ν', Contemporary Bayesian Inference, Naxos, Greece, 7–10 July.

Castiglione, C. (2022).
Approximate belief updating via semiparametric variational Bayes. (poster presentation)
Statistical Methods and Models for Complex Data 2022, Padova, Italy, 21–21 September.

Castiglione, C., Bernardi, M. (2022).
Approximate general Bayesian inference via semiparametric variational Bayes. (invited presentation)
24th Conference on Computational Statistics (COMPSTAT 2022), Bologna, Italy, 23–26 August.

Castiglione, C., Bernardi, M. (2022).
Probabilistic load forecasting via dynamic quantile regression. (poster presentation)
36th International Workshop on Statistical Modelling (IWSM 2022), Trieste, Italy, 18–22 July.

Castiglione, C., Bernardi, M. (2022).
Approximate general Bayesian inference via semiparametric variational Bayes. (oral presentation)
2022 World Meeting of the International Society for Bayesian Analysis (ISBA 2022), Montreal, Canada, 26 June – 1 July.

Castiglione, C., Bernardi, M. (2022).
Sparse signal extraction via Variational SVM. (oral presentation)
51th Scientific Meeting of the Italian Statistical Society (SIS 2022), Caserta, Italy, 22–24 June.

Castiglione, C. (2021).
Approximate variational inference based on data augmentation methods. (oral presentation)
14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2021), London, UK, 18–20 December.

Castiglione, C., Bernardi, M. (2021).
Variational inference for non-crossing quantile regression. (poster presentation)
2021 World Meeting of the International Society for Bayesian Analysis (ISBA 2021), Online, 28 June – 02 July.

Castiglione, C., Bernardi, M. (2022).
Semiparametric variational inference for Bayesian quantile regression. (oral presentation)
50th Scientific Meeting of the Italian Statistical Society (SIS 2021), Cagliari, Italy, 22–24 June.

Software

sgdGMF: An `R`/`C++` package for the estimation of high-dimensional generalized matrix factorization (GMF) models via adaptive stochastic gradient descent (SGD). — CRAN package, github/repo

BayesGLMM: A `Julia` package for the estimation of Bayesian generalized linear mixed effect models (GLMM) via variational approximations and non-conjugate variations message passing. — github/repo

Teaching

Contract instructor, 2 hours — Milan, Italy
Bocconi University — Feb 2025 - Jul 2025
Course: *Quantitive Methods for Social Sciences (Module II - Data Analytics)*

Teaching assistant, 14 hours — Milan, Italy
Bocconi University — Feb 2025 - Jul 2025
Course: *Quantitive Methods for Social Sciences (Module II - Data Analytics)*

Contract instructor, 4 hours — Milan, Italy
Bocconi University — Feb 2025 - Jul 2025
Course: *Machine Learning (Module I - Introduction)*

Teaching assistant, 20 hours — Milan, Italy
Bocconi University — Feb 2025 - Jul 2025
Course: *Machine Learning (Module I - Introduction)*

Teaching assistant, 10 hours — Milan, Italy
Bocconi University — Feb 2025 - Jul 2025
Course: *Foundations of Data Science*

Teaching assistant, 14 hours — Padua, Italy
University of Padua, Department of Statistical Sciences — Oct 2024 - Jan 2025
Course: *Multivariate data analysis*, Bachelor in Statistics

Teaching assistant, 22 hours — Padua, Italy
University of Padua, Department of Statistical Sciences — Feb 2024 - Jul 2024
Course: *Statistical Models 1*, Bachelor in Statistics

Teaching assistant, 14 hours — Padua, Italy
University of Padua, Department of Statistical Sciences — Oct 2023 - Jan 2024
Course: *Multivariate data analysis*, Bachelor in Statistics

Academic tutor, 25 hours — Padua, Italy
University of Padua, Department of Statistical Sciences — Sep 2017 - Sep 2018
Course: *Advanced statistics*, Master in Statistics

Academic tutor, 25 hours — Padua, Italy
University of Padua, Department of Statistical Sciences — Sep 2017 - Sep 2018
Course: *Calculus 1*, Bachelor in Statistics

Supervising experience

Master thesis, course in Mathematical Engineering, Politecnico di Milano — 2023
Title: *Penalised quantile spatial regression: simultaneous estimation and spatio-temporal modelling*
Students: Ilenia Di Battista, Marco F. De Sanctis
Advisors: Prof. Laura M. Sangalli, Eleonora Arnone, **Cristian Castiglione**

Referee service

Bernoulli, Statistical Modelling, STAT, Demonstratio Mathematica.