

Europass Curriculum Vitae



Personal information

Name / Surname	Menafoglio, Alessandra
Address	Piazza Leonardo da Vinci 32, 20133, Milano
Personal Email	alessandra.menafoglio@polimi.it
Nationality	Italian
Date of birth	July 28th, 1987

Positions and Education

Nov. 2019 -	Assistant Professor (<i>senior position</i> ; Ricercatore TD - B, SECS/S-01, L. 240/2010). MOX, Department of Mathematics, Politecnico di Milano, Milan (Italy).
Nov. 2016 - Nov. 2019	Assistant Professor (<i>junior position</i> ; Ricercatore TD - A, SECS/S-01, L. 240/2010). MOX, Department of Mathematics, Politecnico di Milano, Milan (Italy).
May 2015 - Oct. 2016	Research Fellow . MOX, Department of Mathematics, Politecnico di Milano, Milan (Italy). Project: <i>Object Oriented Spatial Statistics</i> .
Jan. 2012 - Mar. 2015	PhD in Mathematical Models and Methods in Engineering . MOX, Department of Mathematics, Politecnico di Milano, Milan (Italy). Grade: Doctor Europaeus cum laude. Thesis: <i>Object Oriented Geostatistics</i> . Advisor: prof. Piercesare Secchi.
Sept. 2009 - Dec. 2011.	Master Degree in Mathematical Engineering (Laurea Magistrale in Ingegneria Matematica). MOX, Department of Mathematics, Politecnico di Milano, Milan (Italy). Grade: 110/110 cum laude.
Sept. 2006 - Jul. 2009.	Bachelor Degree in Mathematical Engineering (Laurea Triennale in Ingegneria Matematica). Politecnico di Milano, Milan (Italy). Grade: 110/110 cum laude.

Honors and Awards

“2019 Andrei Borisovich Vistelius Research Award”, Personal award given by the International Association for Mathematical Geosciences (IAMG), 1st classified. The Andrei Borisovich Vistelius Research Award is presented biannually to early-career scientists for promising contributions in research in the fields of mathematical geosciences or geoinformatics.

“2018 Young Statistician Award”, Personal award given by the European Network for Business and Industrial Statistics (ENBIS), 1st classified. The Young Statistician Award aims to honour the work of young people in introducing innovative methods, promoting the use of statistics and/or successfully using it in the daily practice.

“Editor’s Choice Awards 2016” for the paper A. Menafoglio, A. Guadagnini, P. Secchi (2016), *WRR*. The selection is made by the Editors of *WRR* based on technical significance, novelty, originality, presentation, and broader implications of the publication. 1st classified (award given to the top 1% of published articles in any calendar year) .

“Eni Award, Debut in Research Prize” (October 2016), Personal award, 1st classified.

“Best Student Oral Presentation” (July 2014), Personal award at geoENV 2014, 3rd classified.

Best Graduate Student Prize of the Academic year 2010-2011 for the Master Degree in Mathematical Engineering at Politecnico di Milano (June 13, 2012). Personal award by Politecnico di Milano, 1st classified.

Visiting

May 2018	Department of Mathematics, King's College London, London, United Kingdom (visiting founded by KCL).
Feb. 2018	Department of Modeling and Valuation, Helmholtz Institute Freiberg for Resource Technology, Germany (visiting founded by Helmholtz Institute).
Nov. 2017	Department of Mathematics and Mathematical Statistics, Umeå University, Sweden (visiting founded by Umeå University).
May 2016	Department of Mathematical Analysis and Applications of Mathematics, Palacký University, Faculty of Science, Olomouc, Czech Republic (visiting founded by Erasmus + Program).
May 2015	School of Earth, Energy & Environmental Sciences, Stanford University, Stanford, CA, USA (visiting funded by Stanford University).
Mar. 2015	Department of Mathematical Analysis and Applications of Mathematics, Palacký University, Faculty of Science, Olomouc, Czech Republic (visiting funded by Palacký University).
Mar.-Jun. 2014	Department of Statistical Science, University College London (UCL), London, United Kingdom.
Nov. 2013	Department of Mathematical Analysis and Applications of Mathematics, Palacký University, Faculty of Science, Olomouc, Czech Republic (visiting funded by Palacký University).

National Professional Qualifications

Jul. 2018	National Academic Qualification as Associate Professor of Statistics (Abilitazione scientifica nazionale alla funzione di professore universitario di II fascia per il settore concorsuale 13/D1 Statistica, DD 222/2012)
-----------	---

Professional Activity

Nov. 2016 - May 2018	Casa Italia - Presidenza del Consiglio dei Ministri Member of "Casa Italia", the mission structure established by the Italian Government and dedicated to prevention and security against natural risks. Role in the project: Expert in Statistics and Data Analysis. Project report: "Rapporto sulla Promozione della sicurezza dai Rischi naturali del Patrimonio abitativo" (2017) http://www.casaitalia.governo.it/it/approfondimenti/rapporto-sulla-promozione-dellasicurezza/.
Jul. 2011 - Nov. 2011	Eni S.p.A. - Exploration and Production Division (Internship) Eni S.p.A, Milano (Italy). <i>Innovative statistical techniques and application to petroleum system modeling</i>: theoretical and computational development of highly innovative statistical methodologies aiming at the treatment of high-dimensional and functional data with application in basin modeling.

Research field and scientific interests

My research is mostly focused on the statistical analysis of complex data with spatial dependence, with particular reference to functional data, compositional data and data in Riemannian manifolds. In the last years, I have been working on introducing and exploring *Object Oriented Spatial Statistics* (O2S2) as an original area of statistics addressing the problem of characterizing sets of spatially dependent, high- or infinite-dimensional data, possibly featured by a heterogeneous spatial structure (e.g., grouping in the data, non-stationarity). Recently, I have also considered object-oriented Kriging for multi-fidelity modeling and statistical meta-modeling. I am currently working on O2S2 for processes taking place in complex spatial domains, such as textured domains, networks or high-dimensional spaces, with application to environmental and industrial data. Further scientific interests include the field of statistical process control in the presence of complex responses, such as misaligned functional data or image data, in the context of emerging production technologies, such as additive manufacturing.

h-index (Scopus): 10

Memberships and affiliations

2018-today	TIES – The International Environmental Society
2017-today	ENBIS – European Network for Business and Industrial Statistics
2016-today	GRASPA-SIS – Gruppo di Ricerca per le Applicazioni della Statistica ai Problemi Ambientali
2015-today	IAMG – International Association for Mathematical Geosciences
2014-today	ySIS – Young SIS
2014-today	CompGeo@MOX – Computational Geosciences at MOX
2013-today	GNAMPA – Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni
2013-today	SIS – Società Italiana di Statistica
2012-today	MOX – Laboratory for Modeling and Scientific Computing, Dipartimento di Matematica, Politecnico di Milano

Journal Articles

- G. Lanzano, S. Sgobba, L. Caramenti, A. Menafoglio (2021) "Ground-Motion Model for Crustal Events in Italy by Applying the Multisource Geographically Weighted Regression (MS-GWR) Method". *Bulletin of the Seismological Society of America*. ISSN: 1943-3573. DOI:10.1785/0120210044.
- V. Rímalová, E. Fišerová, A. Menafoglio, A. Pini (2021) "Inference for spatial regression models with functional response using a permutational approach", *Journal of Multivariate Analysis*, ISSN:0047-259X. Accepted.
- R. Scimone, A. Menafoglio, L. M. Sangalli, P. Secchi (2021) "A look at the spatio-temporal mortality patterns in Italy during the COVID-19 pandemic through the lens of mortality densities", *Spatial Statistics*. ISSN:2211-6753. DOI: 10.1016/j.spasta.2021.100541.
- R. Scimone, T. Taormina, B. M. Colosimo, M. Grasso, A. Menafoglio, P. Secchi (2021) "Statistical Modeling and Monitoring of Geometrical Deviations in Complex Shapes With Application to Additive Manufacturing", *Technometrics*. ISSN:0040-1706. DOI: 10.1080/00401706.2021.1961870.
- O. Didkovskyi, G. Azzone, A. Menafoglio, P. Secchi (2021) "Social and material vulnerability in the face of seismic hazard: an analysis of the Italian case", *Journal of the Royal Statistical Society - Series A*. ISSN:1467-985X. DOI: 10.1111/rssa.12739
- K. Hron, A. Menafoglio, J. Palarea-Albaladejo, P. Filzmoser, R. Talská, J. J. Egozcue (2021) "Weighting of Parts in Compositional Data Analysis: Advances and Applications." *Mathematical Geosciences*. ISSN:1874-8961. DOI: 10.1007/s11004-021-09952-y
- Marta Galvani, Agostino Torti, Alessandra Menafoglio and Simone Vantini (2021) "FunCC: A new bi-clustering algorithm for functional data with misalignment" *Computational Statistics & Data Analysis*, 160, 107219. ISSN:0167-9473. DOI: 10.1016/j.csda.2021.107219
- M. S. Bernardi, P.C. Africa, C. de Falco, L. Formaggia, A. Menafoglio, S. Vantini (2021) "On the Use of Interferometric Synthetic Aperture Radar Data for Monitoring and Forecasting Natural Hazards", *Mathematical Geosciences*. ISSN:1874-8961. DOI: 10.1007/s11004-021-09948-8.
- A. Menafoglio, L. Guadagnini, A. Guadagnini, P. Secchi (2021) "Object oriented spatial analysis of natural concentration levels of chemical species in large-scale groundwater bodies". *Spatial Statistics*, 43, 100494. ISSN:2211-6753. DOI: 10.1016/j.spasta.2021.100494.
- A. Menafoglio, D. Pigoli, P. Secchi (2020) "Kriging Riemannian Data via Random Domain Decompositions", *Journal of Computational and Graphical Statistics*, in press. ISSN: 10618600. DOI: 10.1080/10618600.2020.1853548.
- F. Gatti, A. Menafoglio, N. Togni, L. Bonaventura, D. Brambilla, M. Papini, L. Longoni (2020) "A novel downscaling procedure for compositional data in the Aitchison geometry with application to soil texture data". *Stochastic Environmental Research and Risk Assessment*, in press. ISSN: 1436-3240. DOI: 10.1007/s00477-020-01847-4.
- A. Menafoglio, S. Sgobba, G. Lanzano, F. Pacor (2020) "Simulation of seismic ground motion fields via object-oriented spatial statistics with an application in Northern Italy". *Stochastic Environmental Research and Risk Assessment*, 32(12), 3421–3437. ISSN: 1436-3240. DOI: 10.1007/s00477-020-01847-4.

- L. Guadagnini, A. Menafoglio, X. Sanchez-Vila, A. Guadagnini (2020) "Probabilistic assessment of spatial heterogeneity of natural background concentrations in large-scale groundwater bodies through Functional Geostatistics". *Science of the Total Environment*, 740, 140139. ISSN: 0048-9697. DOI: 10.1016/j.scitotenv.2020.140139.
- F. Centofanti, A. Lepore, A. Menafoglio, B. Palumbo, S. Vantini (2020) "Functional Regression Control Chart". *Technometrics*. ISSN: 0040-1706. DOI: 10.1080/00401706.2020.1753581.
- R. Talská, A. Menafoglio, K. Hron, J.J. Egozcue, J. Palarea-Albaladejo (2020) "Weighting the domain of probability densities in functional data analysis", *Stat.* ISSN:2049-1573. DOI: 10.1002/sta4.283.
- A. Capezza, A. Lepore, A. Menafoglio, B. Palumbo, S. Vantini (2020) "Control charts for monitoring ship operating conditions and CO₂ emissions based on scalar-on-function regression", *Applied Stochastic Models in Business and Industry*, 36(3), 477-500. ISSN: 1526-4025. DOI:10.1002/asmb.2507.
- V. Rímalová, A. Menafoglio, A. Pini, V. Pechanec, E. Fišerová (2020). "A permutation approach to the analysis of spatiotemporal geochemical data in the presence of heteroscedasticity". *Environmetrics*. 31:e2611. ISSN:1099-095X. DOI: 10.1002/env.2611.
- A. Menafoglio, P. Secchi (2019): "O2S2: A new venue for computational geostatistics", *Applied Computing and Geosciences*, 2, 100007. ISSN: 2590-1974. DOI: 10.1016/j.acags.2019.100007.
- A. Menafoglio, G. Gaetani, P. Secchi (2018): "Random domain decompositions for object-oriented Kriging over complex domains", *Stochastic Environmental Research and Risk Assessment*, 32(12), 3421–3437. ISSN: 1436-3240. DOI: 10.1007/s00477-018-1596-z.
- A. Menafoglio, M. Grasso, P. Secchi, B.M. Colosimo, (2018): "Profile Monitoring of Probability Density Functions via Simplicial Functional PCA with application to Image Data", *Technometrics*, 60(4), 497-510. ISSN: 0040-1706. DOI: 10.1080/00401706.2018.1437473.
- R. Talska, A. Menafoglio, J. Machalova, K. Hron, E. Fiserova (2018): "Compositional regression with functional response", *Computational Statistics & Data Analysis*, 123, 66–85. ISSN: 0167-9473. DOI: 10.1007/s00477-017-1486-9.
- O. Grujic, A. Menafoglio, G. Yang, J. Caers (2018): "Cokriging for multivariate Hilbert space valued random fields. Application to multifidelity computer code emulation", *Stochastic Environmental Research and Risk Assessment*, 32(7), 1955-1971. ISSN: 1436-3240. DOI: 10.1007/s00477-017-1486-9 .
- A. Menafoglio, P. Secchi (2017): "Statistical analysis of complex and spatially dependent data: a review of Object Oriented Spatial Statistics", *European Journal of Operational Research*, 258(2), pages 401–410. DOI:10.1016/j.ejor.2016.09.061. ISSN: 0377-2217.
- A. Menafoglio, A. Guadagnini, P. Secchi (2016): "Stochastic Simulation of Soil Particle-Size Curves in Heterogeneous Aquifer Systems through a Bayes space approach", *Water Resources Research*, 52, 5708–5726. ISSN: 0043-1397.
- A. Menafoglio, O. Grujic, J. Caers (2016): "Universal kriging of functional data: trace-variography vs cross-variography? Application to gas forecasting in unconventional shales", *Spatial Statistics*, 15, 39–55. ISSN:2211-6753.
- D. Pigoli, A. Menafoglio and P. Secchi (2016): "Kriging prediction for manifold-valued random fields", *Journal of Multivariate Analysis*, 145, 117–131. ISSN:0047-259X.
- A. Menafoglio, P. Secchi, A. Guadagnini (2016): "A Class-Kriging predictor for Functional Compositions with Application to Particle-Size Curves in Heterogeneous Aquifers", *Mathematical Geosciences*, 48(4), 463–485. ISSN:1874-8961. DOI: 10.1007/s11004-015-9625-7 .
- K. Hron, A. Menafoglio, M. Templ, K. Hruzova, P. Filzmoser (2016): "Simplicial principal component analysis for density functions in Bayes spaces", *Computational Statistics & Data Analysis*, 94, 330–350. ISSN:0167-9473. DOI:10.1016/j.csda.2015.07.007 .
- M. Grasso, A. Menafoglio, B. M. Colosimo, P. Secchi (2016): "Using curve registration information for Profile Monitoring", *Journal of Quality Technology*, 48(2), 1–28. ISSN: 0022-4065 .

A. Menafoglio, G. Petris (2016): “Kriging for Hilbert-space valued random fields: the operatorial point of view”, *Journal of Multivariate Analysis*, 146, 84–94. ISSN:0047-259X. DOI: 10.1016/j.jmva.2015.06.012 .

A. Menafoglio, A. Guadagnini, P. Secchi (2014): “A Kriging Approach based on Aitchison Geometry for the Characterization of Particle-Size Curves in Heterogeneous Aquifers”, *Stochastic Environmental Research and Risk Assessment*, 28(7), 1835–1851. ISSN: 1436-3240. DOI: 10.1007/s00477-014-0849-8 .

A. Menafoglio, P. Secchi, M. Dalla Rosa (2013): “A Universal Kriging predictor for spatially dependent functional data of a Hilbert Space”, *Electronic Journal of Statistics*, 7, 2209–2240. ISSN:1935-7524, DOI: 10.1214/13-EJS843, with supplement “Supplementary material for: ‘A Universal Kriging predictor for spatially dependent functional data of a Hilbert Space’”, DOI: 10.1214/13-EJS843SUPP.

Book Chapters

A. Menafoglio (2021), “Principal Component Analysis”. In *Earth Sciences Series. Encyclopedia of Mathematical Geosciences*, forthcoming.

A. Menafoglio (2021), “Spatial Statistics for Distributional Data in Bayes Spaces: from Object-Oriented Kriging to the Analysis of Warping Functions”. In *Festschrift in the Honor of Vera Pawlowsky-Glahn*, Ed: P. Filzmoser, J. A. Martín-Fernández, J. Palarea, K. Hron, Springer, forthcoming.

P. Filzmoser, K. Hron and A. Menafoglio (2021), “Logratio approach to distributional modeling”. In *Festschrift in the Honor of Christine Thomas-Agnan*, Ed: A. Daouia, A. Ruiz-Gazen, Springer, forthcoming.

A. Menafoglio, D. Pigoli and P. Secchi (2020), “O2S2 for the Geodata Deluge”. In *Functional and High-Dimensional Statistics and Related Fields*, Ed. G. Aneiros, I. Horová, M. Hušková, P. Vieu, Springer. ISBN: 978-3-030-47755-4.

A. Menafoglio, D. Pigoli and P. Secchi (2019), “Mathematical foundations of functional Kriging in Hilbert spaces and Riemannian manifolds”. In *Geostatistical Functional Data Analysis*, Ed. J. Mateu, R. Giraldo, Wiley. ISBN: 978-1-119-38784-8.

A. Menafoglio, P. Secchi and D. Pigoli (2019), “Geostatistical analysis in Bayes spaces: probability densities and compositional data”. In *Geostatistical Functional Data Analysis*, Ed. J. Mateu, R. Giraldo, Wiley. ISBN: 978-1-119-38784-8.

A. Stamm, O. Commowick, A. Menafoglio, S.K. Warfield (2018). “A Bayes Hilbert Space for Compartment Model Computing in Diffusion MRI”. *Medical Image Computing and Computer Assisted Intervention - MICCAI 2018*. Lecture Notes in Computer Science series. Volume 11072, to appear.

A. Menafoglio, K. Hron (2018), “Bayes Spaces”. Forthcoming in Wiley StatsRef: Statistics Reference Online, John Wiley & Sons, Ltd.

L. Azzimonti, M. A. Cremona, A. Ghiglietti, F. Ieva, A. Menafoglio, A. Pini, P. Zanini (2015): “BarCamp: Technology Foresight and Statistics for the Future”, in *Advances in Complex Data Modeling and Computational Methods in Statistics. Contributions to Statistics*, pp. 53–65. ISBN:9783319111483.

A. Menafoglio, P. Secchi (2014): “Kriging prediction for spatial random fields valued in a Hilbert space”, in Bongiorno, E.G., Salinelli, E., Goia, A., Vieu, P. (eds), *Contributions in infinite-dimensional statistics and related topics*, pp. 191–196, Esculapio Pub. Co., Bologna. ISBN:9788874887637.

E. Baştuğ, A. Menafoglio, T. Okhulkova (2013): “Polynomial Chaos Expansion for an Efficient Uncertainty and Sensitivity Analysis of Complex Numerical Models”, in Steenbergen, R.D.J.M., van Gelder, P.H.A.J.M., Miraglia, S., Vrouwenvelder, A.C.W.M. (eds) *Safety, Reliability and Risk Analysis: Beyond the Horizon*, pp. 3153–3161, CRC Press, Taylor & Francis Group, London. ISBN:9781138001237.

Manuscripts under revision

L. Clarotto, D. Allard, A. Menafoglio (2021) "A new class of α -transformations for the spatial analysis of Compositional Data".

A. Torti, M. Galvani, A. Menafoglio, P. Secchi, S. Vantini (2021), "A General Bi-clustering Algorithm for Hilbert Data: Analysis of the Lombardy Railway Service" *MOX-report 21/2021*. Politecnico di Milano.

L. Bonaventura, F. Gatti, A. Menafoglio, D. Rossi, D. Brambilla, M. Papini, L. Longoni (2021) "An efficient and robust soil erosion model at the basin scale" *MOX-report 34/2021*. Politecnico di Milano.

F. Centofanti, A. Lepore, A. Menafoglio, B. Palumbo, S. Vantini (2021) "Adaptive Smoothing Spline Estimator for the Function-on-Function Linear Regression Model" arXiv:2011.12036.

R. Peli, A. Menafoglio, M. Cervino, L. Dovera, P. Secchi (2021) "Physics-based Residual Kriging for dynamically evolving functional random fields" *MOX-report 14/2021*. Politecnico di Milano.

L. Caramenti, A. Menafoglio, S. Sgobba, G. Lanzano (2020) "Multi-Source Geographically Weighted Regression for Regionalized Ground-Motion Models". *MOX-report 67/2020*. Politecnico di Milano.

K. Hron, J. Machalová, A. Menafoglio (2020) "Bivariate densities in Bayes spaces: orthogonal decomposition and spline representation". *MOX-report 83/2020*. Politecnico di Milano.

A. Prior, A. Menafoglio, K.G. van den Boogaart, K. Bachmann, J. Benndorf, R. Tolosana-Delgado (2020) "A Hilbert Space Approach For Ensemble Kalman Filter Of Distributional-Valued Random Fields".

Appearances in Popular Media

C. Lacava (2018): "*Siete Creative? Fate le Scienziate!*", *Io Donna*, July 28th, 2018.

F. Cavadini (2018): "*Alessandra sceglie la matematica: 'Un investimento sul mio futuro'*", *Corriere della Sera* (Edizione Milano), March 8th, 2018.

I. Carpinelli (2017): "*La ricerca in rosa*", *Quotidiano Energia*, March 8th, 2017.

M. C. Ceresa (2016): "*La nuova energia disegnata dalla ricerca*", *Il Sole 24 Ore*, October 26th, 2016.

M. Cosenza (2016): "*Eni Award 2016, l'innovazione sgorga dal sottosuolo*", *Wired*, October 23rd, 2016, <http://www.wired.it/scienza/energia/2016/10/23/eni-award-2016-studi-suolo/>.

G. M. De Francesco (2016): "*Così il Nobel per l'ambiente valorizzerà le energie pulite*", *Il Giornale*, October 22nd, 2016, p.22.

Eni Web (2016): "*Eni Award 2016 - The Winner is Alessandra Menafoglio*", <https://youtu.be/frQVpTlwdvU>, October 20th, 2016.

G. Caprara (2016): "*I cervelli non in fuga: 'Noi crediamo nell'Italia'*", *Corriere della Sera*, October 1st, 2016, p.27.

Editorial and Refereeing activity

2019-today Associate Editor of Stochastic Environmental Research and Risk Assessment.

2019-today Associate Editor of Applied Computing and Geosciences.

2019-today Member of the Editorial Board of Mathematical Geosciences.

2013-today 2015-today	Reviewer for international journals: Applied Geochemistry, Austrian Journal of Statistics, Computational Geosciences, Computational Statistics, Environmental and Ecological Statistics, Journal of Applied Statistics, Journal of Geochemical Exploration, Journal of Multivariate Analysis, Journal of the Royal Statistical Society - Series C, Journal of Statistical Software, Mathematical Geosciences, Statistical Methods & Applications, Statistics & Computing, Statistics & Probability Letters, SORT, Stochastic Environmental Research and Risk Assessment. Referee for MSc theses in Mathematical Engineering.
Conference Organization and other scientific activities	Member of the scientific committee of the IAMG 2023 Trondheim, Norway. Member of the scientific committee of the GeoENV 2022 Parma, Italy. Member of the scientific committee of the IAMG 2022 Nancy, France. Member of the local organizing committee of the SIAM-GS 2021 Milan, Italy, (ca. 500 participants). Member of the scientific committee of the IAMG 2018 September 2-8, 2018, Olomouc, Czech Republic (ca. 300 participants). Member of the scientific committee of the IAMG 2017 September 2-7, 2017, Perth, Australia (ca. 300 participants). Member of the scientific committee of the CoDaWork 2017 June 5-7, 2017, Abbadia San Salvatore (SI), Italy (ca. 100 participants). Member of the organizing committee of the BarCamp "Technology foresight and statistics for the future", September 2, 2013, Milan (Italy) (ca. 60 participants).
Scientific collaborations Main National scientific collaborations Main International scientific collaborations	Dipartimento di Ingegneria Civile e Ambientale, Politecnico di Milano (3 papers) Dipartimento di Meccanica, Politecnico di Milano (2 papers) Istituto Nazionale di Geofisica e Vulcanologia (1 paper) School of Earth, Energy & Environmental Sciences, Stanford University, USA (2 papers) Department of Mathematical Analysis and Applications of Mathematics, Palacký University Olomouc, Czech Republic (3 papers) Department of Mathematics, King's College London, UK (2 papers) Department of Civil and Environmental Engineering, Universitat Politècnica de Catalunya, Spain (1 paper) Department of Mathematical Sciences, University of Arkansas, AR, USA (1 paper) Institute of Statistics and Mathematical Methods in Economics, Vienna University of Technology, Austria (1 paper) Helmholtz-Zentrum Dresden-Rossendorf (1 submitted paper)
Funded projects	Eni DARM – Data Analytics for Reservoir Modeling (Jan. 2019 - June 2021) Role in the project: Investigator Partners: Politecnico di Milano Contractor: Eni Exploration & Production SMART-SED: Sustainable Management of sediment transport in response to climate change conditions (June 2018 - Nov. 2020) Role in the project: Co-Responsible of WP3 – SMART-SED modelling

Partners: Department of Civil and Environmental Engineering, Department of Mathematics, Politecnico di Milano

Funding: Fondazione Cariplo.

Sviluppo di un metodo statistico per la predizione della concentrazione di marcatori da rilevazioni tempo-dipendenti di sensori conduttivimetrici (Dec. 2018 - June 2019)

Role in the project: Principal Investigator

Partners: Department of Mathematics, Politecnico di Milano

Contractor: SICPA Italia.

Progetto per una rete nazionale a supporto della mobilità elettrica (Apr. 2016 - July 2016)

Role in the project: Investigator

Partners: Department of Mathematics, Department of Management, Economics and Industrial Engineering and Department of Energy, Politecnico di Milano

Contractor: Enel S.p.A., Enel Foundation

Project report: "Apriamo la strada al trasporto elettrico nazionale" edited by G. Azzone, P. Secchi, D. Zaninelli.

Classificazione di immagini fotografiche per il riconoscimento automatico della presenza d'aria in una siringa (Jan. 2016 - Apr. 2016)

Role in the project: Investigator

Partners: Politecnico di Milano

Contractor: Thermofisher

Eni CompGEO (July 2012 - July 2013)

Role in the project: Investigator

Partners: Politecnico di Milano

Contractor: Eni Exploration & Production

Invited talks

A. Menafoglio, L. Guadagnini, A. Guadagnini, and P. Secchi (2021) "An object-oriented approach to the analysis of natural background level concentrations of chemical species in large-scale groundwater bodies". GRASPA 2021 (held online due to COVID-19), Jun. 2021.

A. Menafoglio (2021) "Object Oriented Spatial statistics in Bayes spaces: from distributional data to phase-amplitude variability". Invited as one of the speakers of the CoDa Day 2021 (held online due to COVID-19). Jun. 2021.

A. Menafoglio (2021) "An object oriented approach to the analysis of spatial complex data". Keynote presentation of GeoENV2020 (held online due to COVID-19), University of Parma. Jun. 2021

A. Menafoglio, P. Secchi (2020): "O2S2 over complex domains: an approach based on Random Domain Decompositions", Advances in Data Science for Big and Complex Data, Paris, Jan. 23, 2020.

A. Menafoglio, O. Grujic, G. Yang, J. Caers (2019): "Object oriented cokriging for data fusion with application to multi-fidelity modeling", ENBIS 2019, Budapest, Sept. 2-4, 2019.

A. Menafoglio (2019): "Object Oriented Spatial Statistics for the analysis of georeferenced complex data", Keynote presentation, IAMG 2019, Penn State University, Aug. 13, 2019.

A. Menafoglio, O. Grujic, G. Yang, J. Caers (2019): "A functional kriging approach to multi-fidelity modelling", GRASPA 2019, Pescara, July 16, 2019.

A. Menafoglio, P. Secchi (2019): "A divide-et-impera approach for the spatial prediction of object data over complex regions", SIS 2019, Milano, June 19, 2019.

A. Menafoglio (2019): "Functional Data Analysis for probability density functions: a Bayes space approach", ODAM 2019, Olomouc, May 30, 2019.

A. Menafoglio, R. Talska, J. Machalova, K. Hron, E. Fiserova (2019): "Function-on-scalar regression for distributional responses", CRoNoS-MDA 2019, Limassol, Apr. 14, 2019.

- A. Menafoglio (2018): "An Object Oriented Approach to the Analysis of Complex Data", 2018 Young Statistician Award Ceremony, ENBIS 2018, Nancy, Sept. 4, 2018.
- A. Menafoglio, G. Gaetani, P. Secchi (2018): "Kriging spatial functional data over complex domains through random domain decompositions", CRoNoS Workshop on Functional Data Analysis, Iasi, Sept. 1-2, 2018.
- A. Menafoglio (2018): "A Bayes space approach to the analysis of probability density functions", COMPSTAT 2018, Iasi, Aug. 28-31, 2018.
- A. Menafoglio, D. Pigoli, P. Secchi (2018): "A geostatistical approach to the analysis of spatial tensor data", TIES 2018, Guanajuato, July 16-20, 2018.
- A. Menafoglio, D. Pigoli, P. Secchi (2018): "Object oriented spatial statistics for georeferenced tensor data", SIS 2018, 49th Scientific meeting of the Italian Statistical Society, Palermo, June 20-22, 2018.
- A. Menafoglio (2018): "Object Oriented Spatial Statistics for the analysis of complex spatial data", invited seminar at King's College London, London, May 10, 2018.
- A. Menafoglio, G. Gaetani, P. Secchi (2017): "Kriging for Hilbert data over complex domains through random domain decomposition", CFE-CMStatistics 2017, London, Dec. 16-18, 2017.
- A. Menafoglio, M. Grasso, P. Secchi, B.M. Colosimo (2017): "Statistical Monitoring of Probability Density Functions for Image Data", ENBIS 2017 Napoli, Sept. 9-14, 2017.
- A. Menafoglio, P. Secchi, A. Guadagnini (2017): "An Object-Oriented approach to Kriging and Uncertainty Quantification for Functional Compositional Data with Spatial Dependence", RSS 2017 Annual Conference, Glasgow, Sept. 4-7, 2017.
- A. Menafoglio, G. Gaetani, P. Secchi (2017): "Kriging for non-stationary object data through Random Domain Decomposition", TIES-GRASPA 2017, Bergamo, July 24-26, 2017.
- A. Menafoglio (2016): "Object Oriented Geostatistics", SRP-NUPUS Student Trip, Politecnico di Milano, Milano.
- Eni Award Lectio Magistralis on "Object Oriented Geostatistics", Oct. 21, 2016, Politecnico di Milano.
- Eni Award Lectio Magistralis on "Object Oriented Geostatistics", Oct. 19, 2016, Università della Basilicata.
- A. Menafoglio, P. Secchi, A. Guadagnini (2016): "Geostatistical K-mean clustering for heterogeneous density functions in composite systems", SIMAI 2016, Politecnico di Milano, Milano.
- A. Menafoglio, A. Guadagnini, P. Secchi (2016): "Object Oriented Geostatistical Simulation of Functional Compositions via Dimensionality Reduction in Bayes spaces", 48th Scientific meeting of the Italian Statistical Society, Università degli Studi di Salerno. Fisciano, June 8-10, 2016.
- A. Menafoglio, P. Secchi, A. Guadagnini (2016): "Object Oriented Kriging in Hilbert spaces with application to particle-size densities in Bayes spaces", CASI 2016, Limerick, May 16-18, 2016.
- A. Menafoglio (2015): "Functional Kriging for probability density functions: a Bayes space approach", Scientific Workshop on Space-time stochastic models and their Applications, Technical University of Crete, Chania, Sept. 17, 2015.
- A. Menafoglio (2015): "Universal Kriging of functional data: application to forecasting unconventional production from existing wells", 28th SCRF annual meeting, Stanford University, May 9, 2015.
- A. Menafoglio (2015): "Spatial clustering in Bayes spaces for Functional Compositions in heterogeneous systems", invited seminar at Palacký University, Olomouc, Mar. 20, 2015.
- A. Menafoglio, G. Petris (2014): "On the measures of spatial dependence for Hilbert data: how much are you ready to pay for a kriging prediction?", ERCIM 2014 - 7th International Conference of the ERCIM Working Group on Computing & Statistics, Pisa, Dec. 6-8, 2014.

Contributed talks at conferences

- A. Menafoglio, A. Guadagnini, P. Secchi (2014): "Geostatistical analysis of Functional Compositions: characterizing random particle-size distributions through the Aitchison geometry", 16th Annual Conference of the International Association for Mathematical Geosciences, New Delhi, Oct. 17-20, 2014.
- A. Menafoglio (2013): "A novel approach for the spatial prediction of functional compositional data: Universal Kriging in the Aitchison geometry", invited seminar at Palacký University, Olomouc, Nov. 5, 2013.
- A. Menafoglio, M. Dalla Rosa, P. Secchi (2013): "A BLU Predictor for Spatially Dependent Functional Data of a Hilbert Space", CLADAG 2013, Modena, Sept. 18-20, 2013.
- A. Menafoglio (2012): "Universal Kriging prediction for spatially dependent functional data of a Hilbert Space", Workshop on new perspective in functional data analysis, Seconda università degli Studi di Napoli. Caserta, Italy, Sept. 26-27, 2012.
- A. Menafoglio (2012): "Spatial prediction of functional data: Universal Kriging in a Hilbert space", 2nd SNAPLE Day, University of Warwick. Coventry, United Kingdom, Sept. 7, 2012.
- A. Menafoglio, L. Guadagnini, A. Guadagnini, P. Secchi (2019): "A spatial analysis in Bayes spaces of the NBL of chemical species in large-scale groundwater bodies", CoDaWork 2019, Terrassa, June 4-7, 2019.
- A. Menafoglio, D. Pigoli, P. Secchi (2018): "Kriging for tensor data through Object Oriented Spatial Statistics", IAMG 2018, Olomouc, Sept. 4-7, 2018.
- A. Menafoglio, M. Grasso, P. Secchi, B.M. Colosimo, (2017): "A Bayes Space Approach to Profile Monitoring of Probability Density Functions for Image Data", CoDaWork 2017, Abbadia San Salvatore, June 5-9, 2017.
- A. Menafoglio, P. Secchi, A. Guadagnini, (2016): "Object-Oriented Kriging and Stochastic Simulation for the geostatistical characterization of environmental data ", Special Session in honor of Prof. D. Krige (Plenary session), GEOSTATS2016, Valencia, Sept. 5-9, 2016.
- A. Menafoglio, P. Secchi, A. Guadagnini, (2015): "Spatial clustering and prediction in Bayes spaces for density functions in composite systems", 17th Annual Conference of the International Association for Mathematical Geosciences, Freiberg, Sept. 6-11, 2015.
- A. Menafoglio, P. Secchi, A. Guadagnini, (2015): "A Bayes-space approach to clustering and prediction of georeferenced functional compositions in heterogeneous systems", CoDaWork 2015, L'Escala, June 2-5, 2015.
- A. Menafoglio, P. Secchi, A. Guadagnini, (2015): "A geostatistical approach to clustering georeferenced density functions in Bayes spaces", ODAM 2015, Olomouc, May 20-22, 2015.
- A. Menafoglio, A. Guadagnini, P. Secchi (2014): "A novel approach to Kriging for functional compositional data with application to particle-size curves in heterogeneous aquifers" (Plenary session), geoENV 2014, Paris, July 9-11, 2014.
- A. Menafoglio, P. Secchi (2014): "Kriging prediction for spatial random fields valued in a Hilbert space" (Poster), Third International Workshop on Functional and Operatorial Statistics, Stresa, June 19-21, 2014.
- A. Menafoglio, A. Guadagnini, P. Secchi (2014): "Kriging prediction for functional compositional data and application to particle-size curves", 47th Scientific meeting of the Italian Statistical Society, Università degli Studi di Cagliari. Cagliari, June 11-13, 2014.
- A. Menafoglio, P. Secchi (2014): "Efficient Spatial Prediction of Functional Data through Object Oriented Kriging" (Poster), i-like Workshop, Oxford, Mar. 20-21, 2014.
- A. Menafoglio, A. Guadagnini, P. Secchi (2013): "Functional Compositional Kriging of particle-size curves in heterogeneous aquifers", ERCIM 2013 - 6th International Conference of the ERCIM Working Group on Computing & Statistics. London, Dec. 14-16, 2013.
- A. Menafoglio, P. Secchi (2013): "Geostatistical analysis of spatially dependent functional data: Universal Kriging in a Hilbert space", S.Co.2013. Milano, Sept. 9-11, 2013.

- A. Menafoglio, A. Guadagnini, P. Secchi (2013): "Spatial Prediction of Probability Density Functions: a Kriging Approach based on Aitchison Geometry" (Poster), CoDaWork2013: Fifth International Workshop on Compositional Data Analysis. Vorau, June 4-7, 2013.
- A. Menafoglio (2012): "Prediction of spatially dependent functional data: Universal Kriging in a Hilbert Space", MOX-Seminar, Politecnico di Milano. Milano, Sept. 19, 2012.
- A. Menafoglio (2012): "Universal Kriging prediction for spatially dependent functional data of a Hilbert Space", Research workshop: High dimensional and dependent functional data, University of Bristol. Bristol, Sept. 10-12, 2012.
- A. Menafoglio, M. Dalla Rosa, P. Secchi (2012): "Prediction of non-stationary functional data: Universal Kriging in a Hilbert space", 46th Scientific meeting of the Italian Statistical Society, Università la Sapienza. Roma, June 20-22, 2012.

Conference Proceedings

- A. Menafoglio, D. Pigoli, P. Secchi (2018): "Object oriented spatial statistics for georeferenced tensor data", *Proceedings of the 49th Scientific meeting of the Italian Statistical Society*, Palermo, June 20-22, 2018.
- F. Centofanti, A. Lepore, A. Menafoglio, B. Palumbo, S. Vantini (2018): "A functional regression control chart for profile monitoring", *Proceedings of the 49th Scientific meeting of the Italian Statistical Society*, Palermo, June 20-22, 2018.
- A. Menafoglio, A. Guadagnini, P. Secchi (2016): "Object Oriented Geostatistical Simulation of Functional Compositions via Dimensionality Reduction in Bayes spaces", *Proceedings of the 48th Scientific meeting of the Italian Statistical Society*, Fisciano, June 8-10, 2016. ISBN: 9788861970618.
- A. Menafoglio, O. Grujic, J. Caers (2015): "Forecasting Production Decline Rate in Unconventional Resources by Kriging of Functional Data", *Proceedings of Petroleum Geostatistics 2015*, Biarritz, Sept. 7-11, 2015.
- A. Menafoglio, A. Guadagnini, P. Secchi (2014): "Geostatistical analysis of Functional Compositions: characterizing random particle-size distributions through the Aitchison geometry", *Proceedings of the 16th Annual Conference of the International Association for Mathematical Geosciences*, New Delhi, Oct. 17-20, 2014. ISBN:9789381891254.
- A. Menafoglio, A. Guadagnini, P. Secchi (2014): "Kriging prediction for functional compositional data and application to particle-size curves", *Proceedings of the 47th Scientific Meeting of the Italian Statistical Society 2014*, Cagliari, June 11-13, 2014. ISBN:9788884678744.
- A. Menafoglio, M. Dalla Rosa, P. Secchi (2013): "A BLU Predictor for Spatially Dependent Functional Data of a Hilbert Space", *Proceedings of CLADAG 2013*, Modena, Sept. 18-20, 2013. ISBN:9788867871179.
- A. Menafoglio, P. Secchi (2013): "Geostatistical analysis of spatially dependent functional data: Universal Kriging in a Hilbert space", *Proceedings of S.Co.2013*, Milano, September 9-11, 2013. ISBN:97888-6493-019-0.
- M. Grasso, N. Frigerio, A. Menafoglio, P. Secchi, B.M. Colosimo (2013): "Functional Data Analysis and Classification for Profile Monitoring and Fault Diagnosis in Waterjet Machining Processes", *Proceedings of S.Co.2013*, Milano, Sept. 9-11, 2013. ISBN:97888-6493-019-0.
- R. Ghazy, M. Ricotti, A. Menafoglio, P. Secchi, S. Vantini (2012): "Cluster analysis of nuclear performance trends" *Proceedings of the European Nuclear Conference 2012*, Manchester, Dec. 9-12, 2012 (available at www.euronuclear.org). ISBN:978-92-95064-14-0.
- A. Menafoglio, M. Dalla Rosa, P. Secchi (2012): "Prediction of non-stationary functional data: Universal Kriging in a Hilbert space", *Proceedings of the 46th Scientific Meeting of the Italian Statistical Society 2012*, Roma, June 20-22, 2012. ISBN:978-88-6129-882-8.

Software

- Grujic O., Menafoglio A. (2017), fdagstat: An R package that implements the methods of geo-statistics for functional data, R package, Github (github.com/ogru/fdagstat).

Academic tutoring

Co-advisor of PhD students in *Mathematical Models and Methods for Engineering* at Politecnico di Milano: Riccardo Scimone (Yrs: 2019-); Riccardo Peli (Yrs: 2018-); Oleksandr Didkovskyi (Yrs: 2017-20).

Co-advisor of research fellows at Politecnico di Milano: Federico Gatti (Yrs: 2019-20).

Academic tutor of visiting PhD students at Politecnico di Milano (Erasmus + Program): Ivana Pavlu (Palacký University - AcYr: 2021/22); Římalová (Palacký University - AcYr: 2018/19); Renáta Talská (Palacký University - AcYr: 2016/17).

Advisor for Master Theses in *Mathematical Engineering* at Politecnico di Milano: Bortolotti, Panichi, Argenio, Zidi, Clarotto, Caramenti, Bonzi, Togni, Bezzegato, Lentoni, Ercole; co-advisor for: Barbi, Bonaldi, Sartori, Torriani, Mascaretti, Callioni, Gaetani, Facchetti.

Teaching

Lecturer of the course "Statistics" (6CFU) ; Master Degree in Bioinformatics for Computational Genomics, Politecnico di Milano & Università Statale di Milano, AcYrs: 2021/22, 2020/21, 2019/20.

Lecturer of the course "Business Data Analytics" (5CFU); Bachelor Degree in Management Engineering, Politecnico di Milano, AcYrs: 2021/22, 2020/21.

Lecturer of the course "Laboratorio di Statistica per Energetica" (5CFU); Bachelor Degree in Energy Engineering, Politecnico di Milano, AcYrs: 2020/21, 2019/20.

Tutor for the project work of the master course *NRS - Data scientist*, MIP, Politecnico di Milano. Yr: 2020.

Tutor for the project work of the master course *CP Insurance Data Management*, MIP, Politecnico di Milano. Yr: 2020.

Lecturer of the modules "Exploratory Data Analysis" and "Clustering"; *CP Insurance Data Management*, MIP, Politecnico di Milano. Yr: 2020.

Lecturer of the course "Applicazioni di statistica per la pianificazione" (4CFU); Bachelor Degree in Urban Planning: Cities, Environment & Landscapes, Politecnico di Milano, AcYrs: 2018/19, 2017/18.

Teaching Assistant of "Applied Statistics" (10CFU); Master Degree in Mathematical Engineering, Politecnico di Milano, AcYrs: 2018/19, 2017/18, 2016/17, 2015/16.

Lecturer of the PhD course "A leap into Functional Data Analysis: from theory to applications" (8h); Università di Napoli "Federico II", AcYrs: 2018/19.

Lecturer of the course "Numerical and Statistical Methods in Geosciences" - Module 2 (4CFU); Master Degree in Mathematical Engineering, Politecnico di Milano, AcYrs: 2018/19, 2017/18, 2016/17.

Teaching Assistant of "Applied Statistics" (5CFU); Master Degree in Management Engineering, Politecnico di Milano, AcYrs: 2016/17.

Lecturer of the PhD course "An Introduction to Functional Data Analysis" (8h); Palacký University, Olomouc, Czech Republic, AcYrs: 2015/16.

Tutoring for laboratory activities of "Probability and Mathematical Statistics" (10CFU); Bachelor Degree in Management Engineering, Politecnico di Milano, AcYrs: 2015/16, 2014/15.

Tutoring for the course of "Applied Statistics" (6CFU); Bachelor Degree in Electrical Engineering, Politecnico di Milano, AcYrs: 2014/15.

Teaching Assistant of "Applied Statistics" (10CFU); Master Degree in Management Engineering, Politecnico di Milano, AcYrs: 2014/15, 2013/14, 2012/13.

Lecturer of the Geostatistics Module (9h) for "Applied Statistics" (10CFU); Master Degree in Mathematical Engineering, Politecnico di Milano, AcYrs: 2019/20, 2018/19, 2017/18, 2016/17, 2015/16, 2014/15, 2012/13, 2011/12.

Tutoring for laboratory activities of "Statistics" (5CFU); Bachelor Degree in Mechanical Engineering, Politecnico di Milano, AcYrs: 2012/13, 2011/12.

Fellowships

Research Fellowship by Dept. of Mathematics - Politecnico di Milano (May 2015): "Object Oriented Spatial Statistics".

PhD Fellowship by MIUR, Ministry of Education, University and Research (Jan 2012).

Educational Activity

Meet me Tonight - Notte dei Ricercatori, Hard Math Café, Milano (Italy).

Yrs: 2018, 2017, 2016, 2015, 2014, 2013, 2012.

Other skills

Language skills

Computing skills

English, fluent (spoken and written, TOEFL iBT certification); Italian, mother tongue.

Experienced programmer in R, Matlab. Good knowledge of WinBUGS, C/C++.