PIETRO CORETTO

CURRICULUM VITAE ET STUDIORUM

Friday 1st November, 2024

PERSONAL DATA

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- Citizenship: Italian
- Language: Italian (mother tongue), English (fluent), French (basic)
- Position: Full Professor of Statistics

EDUCATION

- 2004–2008: Ph.D. in Statistical Sciences, University College London (UCL, UK). Primary supervisor: Christian Hennig (Department of Statistical Science, UCL). Secondary Supervisor: A. Philip Dawid (Department of Pure Mathematics and Mathematical Statistics, University of Cambridge)
- 2003–2004: Master of Sciences in Economics, University of Pennsylvania (Philadelphia, Usa)
- 2002–2003: Master in Economics and Finance (MEF), University of Napoli "Federico II" (Italy)
- 1998–2002: Laurea in Economia e Commercio (B.A. in Economics and Business Studies), University of Salerno (Italy). Final score: summa cum laude with distinction. Thesis supervisor: Prof. Marco Pagano

HONORS, PRIZES AND SCHOLARSHIPS

- 2018: gold medal for the "Best Teaching Award", MEF/LMEF graduate program in Economics and Finance, University of Naples "Federico II"
- 2009: nominated for the "Classification Society Distinguished Dissertation Award" by the IFCS (International Federation of Classification Societies)
- 2007: "Costas Goutis Prize". For the best research work leading to the transfer to PhD registration. Awarded by the research committee of the Department of Statistical Sciences, University College London (UCL)
- 2006–2007: "Graduate School Scholarship", from University College London (UCL)
- 2003–2005: "Giovanna Crivelli" scholarship from Unicredito Italiano Spa
- 2002: "Angelo Costa Prize" (VI edition, International). Best of the papers selected by an international scientific committee comprising R. Solow (Nobel 1987), R. Mundell (Nobel 1999), P. Diamond, et al.
- 2002: Banca Nazionale delle Comunicazioni Prize (for high quality BA dissertations selected in Italy). From B.N.C. Foundation
- 2002–2003: Scholarship from Italian Society for Investment Professionals (ISIP)

PROFESSIONAL EXPERIENCES AND RESEARCH PROJECTS

- 2023—present: Project: "Methodological and computational issues in large-scale time series models for economics and finance" PRIN 20223725WE. Funded by Ministero dell'Università e della Ricerca. Total fund: 210,403 Euro. Role: research team member.
- 2022—present: Project: "Start UPP: modelli, sistemi e competenze per l'implementazione dell'ufficio per il processo" CUP H29J22000390006. Funded by Ministero della Giustizia. Total fund: 9,389,592 Euro. Role: research team member.
- 2006—present: Principal investigator in several FARB research projects funded by University of Salerno.
- 2013–2017: Project: "A multicriterion approach for cluster validation" EP/K033972/1. Funded by Engineering and Physical Sciences Research Council (EPSRC, UK). Total fund: 98,024 GBP. Role: research team member.
- 2012–2015: Project: "Forecasting economic and financial time series: understanding the complexity and modeling structural change" PRIN 2010J3LZEN. Founded by Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR). Total fund: 506,134 Euro. Role: research team member.
- 2009–2012: Project: "High Performance Computing" ASSA098434. Funded by University of Salerno. Total fund: 49,000 Euro Role: research team member.
- 2008–2011: Project: "Evolutionary Computation in Statistics" PRIN 20077P5AWA. Founded by Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR). Total fund: 52,315 Euro. Role: research team member.
- 2007–2009: Project: "Economic consequences of the demographic transition in Europe" INTERLINK II04C0ECL72007. Partners: Institute of Fiscal Studies (IFS, London), Tilburg University, Goethe University Frankfurt. Role: research team member.
- 2006: Consultancy for Cirrus Capital, London, UK
- 2005–2006: Project: "Quantitative Analysis of Financial Markets". Founded by University of Salerno. Role: research team member.
- 2002–2002: Project: "Financial Market Integration, Corporate Financing and Economics Growth". Funded by the European Commission. Role: research team member.

SERVICE TO PROFESSION

Local management duties

- 2022—present: scientific director of the "SP5LAB" computing laboratory, University of Salerno
- 2018—present: member of the committee for student orientation, degree in *Statistics for Big Data*, University of Salerno
- 2012—present: member of the academic board of the PhD program in *Economics and Policy of Markets and Firms*, University of Salerno.
- 2012—present: member of the editorial committee; Department of Economics and Statistics, University of Salerno
- 2018–2019: member of the local committee for the project "Piano Nazionale Lauree Scientifice" (PLS, founded by MIUR)

Editorial Activity. Referee for (in alphabetical order): Advances in Classification and Data Analysis, BMC Bioinformatics, Bioinformatics, Biometrika, Biostatistics, Communications in Statistics, Computational Statistics and Data Analysis, Electronic Journal of Statistics, IEEE Transactions on Cybernetics, IEEE Transactions on Pattern Analysis and Machine Intelligence, Journal of the American Statistical Association, Journal of Computational and Graphical Statistics, Journal of Machine Learning Research,

Journal of Multivariate Analysis, Journal of the Korean Statistical Society, Machine Learning, Mathematical and Computational Applications, Metron, Statistical Methods and Applications, Statistical Modelling, Statistical Papers, Statistics and Computing.

Organization of Scientific Events

- 2023: member of organizing committee of the "14-th Scientific Meeting Classification and Data Analysis Group" (CLADAG-2023); organized by SIS-CLADAG; September 11–13; Salerno, Italy
- 2018: member of organizing committee of the "International Summer School on Clustering, Data Analysis and Visualization of Complex Data"; organized by ERS-IASC, ECAS and SIS-CLADAG; May 21–25; Catania, Italy
- 2018: member of the local organizing committee for the "4th Conference of the International Society for Nonparametric Statistics" (ISNPS2018), June 11–15 2018, Salerno, Italy
- 2016: member of the local organizing committee for the "48th Meeting of the Italian Statistical Society" (SIS2016), June 8–10 2016, Salerno, Italy
- 2014: member of the local organizing committee for the "6th International Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance" (MAF2014), April 22–24, 2014, Vietri sul Mare (SA) Italy
- 2010: member of the local organizing committee for the "4th International Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance" (MAF2010), April 7–9, 2010, Ravello (SA) Italy

CONFERENCES, WORKSHOPS AND SEMINARS

- Co-organizer of the invited conference session "Recent advances in statistical learning and data analysis", Conference: IES 2023, Statistical methods for evaluation and quality: techniques, technologies and trends (T³), August 30–September 1, 2023, Pescara, Italy
- Invited talk at the 17th conference of the International Federation of Classification Societies, 19-23 July 2022, Porto, Portugal
- Invited talk at the European Conference on Data Analysis (ECDA2022), September 14–16, 2022, Napoli, Italy
- Invited talk at the Workshop on Model-Based Clustering and Classification (MBC²-2022), August 31–September 2, 2022, Catania, Italy
- Invited talk at the 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2021) December 18–20, 2021, London, UK
- Seminar at Department of Statistics "P. Fortunati", University of Bologna, April 1, 2021, Bologna, Italy
- Co-organizer of the special conference session "Time series clustering", Conference: 13-th Scientific Meeting, Classification and Data Analysis Group (CLADAG 2021), September 9–11, 2021, Firenze, Italy
- Invited talk at the International Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance (MAF2020), April 15–17, 2020, Geneva, Switzerland
- Invited talk at the 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019), December 19–21, 2020, London, UK
- Organizer of the conference session: "Cluster validation and the selection of a cluster", conference: 12-th Scientific Meeting Classification and Data Analysis Group (CLADAG 2019). September 11–13, 2019, Cassino, Italy
- Invited talk at the 12-th Scientific Meeting Classification and Data Analysis Group (CLADAG 2019), September 11–13, 2019, Cassino, Italy
- Co-organizer of the conference session: "Nonparametric inference for complex data", conference: Smart Statistics for Smart Applications (SIS 2019). June 18–21, 2019, Milan, Italy

- Invited talk at the Workshop on Model-Based Clustering and Classification (MBC²-2018), September 5–7, 2018, Catania, Italy
- Invited talk at the Conference of International Federation of Classification Societies (IFCS-2017), August 8–10, 2017, Tokyo, Japan
- Invited talk at "Statistics and Data Science: New challenges, new generations" (SIS 2017), Conference of the Italian Statistical Society (SIS), June 28-30, 2017, Firenze, Italy
- Invited talk at the Workshop on Model-Based Clustering and Classification (MBC2), Università di Catania, Italy, September 2016
- Discussant for the invited session: "Clustering in time series", at the 10th Scientific Meeting of the CLADAG Group of the Italian Statistical Society (CLADAG 2015), Santa Margherita di Pula, Italy, October 2015
- Invited talk at the 10th Scientific Meeting of the CLADAG Group of the Italian Statistical Society (CLADAG 2015), Santa Margherita di Pula, Italy, October 2015
- Invited talk at the 2nd Workshop PRIN 2010J3LZEN group, Università Bologna, Italy, November 2015
- Invited talk at the 7th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2014), University of Pisa, Italy, December 2014
- Participation to the Workshop on Model-Based Clustering and Classification (MBC2), University of Catania, Italy, September 2014
- Invited talk the 1st Workshop PRIN 2010J3LZEN, University of Tor Vergata, Rome, Italy, June 2014
- Invited talk at the 47th Scientific meeting Italian Statistical Society (SIS 2014), Cagliari, Italy, June 2014
- Invited talk at the 6th International Conference of the ERCIM WG on Computing and Statistics (ERCIM 2013), University of London, London, UK, December 2013
- Invited talk at the 46th Scientific meeting Italian Statistical Society (SIS 2012) Rome, Italy, June 2012
- Invited talk at the 4th International Conference of the ERCIM WG on Computing and Statistics (ERCIM 2011), University of London, London, UK, December 2011
- Invited talk at the *International conference on Evolutionary Computation in Statistics*, University of Tor Vergata, Roma, Italy, June 2011
- Invited talk the 3rd International Conference of the ERCIM WG on Computing and Statistics (ERCIM 2010), University of London, London, UK, December 2010
- Invited talk at the International Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance (MAF10), Ravello, Italy, April 2010
- Invited talk at the *International conference on Evolutionary Computation in Statistics*, University Ca' Foscari, Venezia, Italy, March 2010
- Invited talk at the 7th Scientific Meeting of the CLADAG Group of the Italian Statistical Society, Catania, Italy, September 2009
- Invited talk a the JSM-ASA, Joint Statistical Meeting of the American Statistical Association, Washington DC, USA, August 2009
- Invited talk at the *Model-Based Clustering Summer Session Workshop*, Institut Henri Poincaré, Paris, France, July 2009
- Seminar at Dpto. Estadística e Investigación Operativa, Universidad de Valladolid, Valladolid, Spain, November 2008.
- Invited talk a the 1st Workshop of the ERCIM Working Group on Computing & Statistics (ERCIM 2008), Neuchâtel, Switzerland, June 2008
- Invited talk at the 1st joint meeting of the Société Francophone de Classification and the Classification and Data Analysis Group (CLADAG 2008) of the Italian Statistical Society, Caserta, Italy, June 2008
- Invited talk at the International Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance (MAF08), Venice, Italy, March 2008
- Invited talk at the 6th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society (CLADAG 2007), Macerata, Italy, September 2007

- Participation to the 31st Annual Conference of the German Classification Society on Data Analysis, Machine Learning, and Applications, Freiburg, Germany, March 2007
- Seminar a the Department of Statistical Sciences, University College London, London, UK, September 2006
- Participation to the 29th Research Students' Conference in Probability and Statistics (RSC 2006), Glasgow, UK, April 2006
- Participation to the 28th Research Students' Conference in Probability and Statistics (RSC 2005), Cambridge, UK, April 2005

TEACHING

Current courses

- Advanced Statistical Learning I (graduate); degree in *Statistics for Finance/Big Data Analytics*; University of Salerno (Since 2020)
- Methods for Data Analysis (MOOC, graduate level, e-learning); degree in *Economics and Finance*; Federica Web Learning, Center for innovation and experimental e-learning, University of Naples Federico II
- ECONOMETRICS (graduate); Master in Economics and Finance (MEF), level II master degree, University of Naples Federico II (Since 2016)
- Statistical Learning (undergraduate); degree in *Statistics for Big Data*; University of Salerno (Since 2020)
- Data Analysis and Visualization (undergraduate); degree in *Statistics for Big Data*; University of Salerno (Since 2018)

Past courses

- 2018: lectures on Advanced Topics in Cluster Analysis (graduate level) at the "International Summer School on Clustering, Data Analysis and Visualization of Complex Data"; organized by ERS-IASC, ECAS and SIS-CLADAG; Catania (Itlay), May 21-25
- 2015—2022: Data Science (graduate); PhD in *Economics and Policy of Markets and Firms*, University of Salerno
- 2009–2022: Computational Statistics (undergraduate); degree in *Management and Computer Science*; University of Salerno
- 2009–2020: Statistics (undergraduate); degree in *Management and Computer Science*; University of Salerno
- 2013–2019: Probability and Inference (graduate); Master in Economics, Finance and Risk Management (MEFiRM), level I master degree, University of Salerno
- 2013–2014: MATHEMATICAL STATISTICS (graduate level); PhD in "Economics, Law and Statistics for Policy, Markets, and Firms", University of Salerno
- 2008–2013: MATHEMATICAL STATISTICS (graduate level); PhD in "Engineering and Economics of Innovations", University of Salerno
- 2008—2009: Sampling Theory and Methods for Business Applications (undergraduate level); Faculty of Economics, University o Salerno
- 2006–2008: Computational Statistics (graduate level); PhD in "Engineering and Economics of Innovations", University of Salerno
- 2006–2008: Data Analysis (undergraduate level); Faculty of Economics, University of Salerno
- 2008: STATISTICS (undergraduate level); GO.TER, II level Master (equivalent to MA), University of Salerno

RESEARCH PUBLICATIONS

Papers in journals (with peer-review)

- Coretto, P. and C. Hennig (2010). A simulation study to compare robust clustering methods based on mixtures. Advances in Data Analysis and Classification, vol. 4(2): pages 111–135. URL: https://www.doi.org/10.1007/s11634-010-0065-4.
- Coretto, P. and C. Hennig (2011). Maximum likelihood estimation of heterogeneous mixtures of gaussian and uniform distributions. *Journal of Statistical Planning and Inference*, vol. 141(1): pages 462–473. URL: https://www.doi.org/10.1016/j.jspi.2010.06.024.
- Coretto, P. (2013). Discussion (invited) of: How to find an appropriate clustering for mixed-type variables with application to socio-economic stratification; by C. Hennig and T. F. Liao. *Journal of the Royal Statistical Society, Series C (Applied Statistics)*, vol. 62: pages 346–347. URL: https://doi.org/10.1111/j.1467-9876.2012.01066.x.
- Coretto, P. and C. Hennig (2016). Robust improper maximum likelihood: tuning, computation, and a comparison with other methods for robust gaussian clustering. *Journal of the American Statistical Association*, vol. 111(516): pages 1648–1659. URL: https://www.doi.org/10.1080/01621459.2015. 1100996.
- Coretto, P. and C. Hennig (2017). Consistency, breakdown robustness, and algorithms for robust improper maximum likelihood clustering. *Journal of Machine Learning Research*, vol. 18(142): pages 1–39. URL: http://jmlr.org/papers/v18/16-382.html.
- Coretto, P. and F. Giordano (2017). Nonparametric estimation of the dynamic range of music signals. Australian & New Zealand Journal of Statistics, vol. 59(4): pages 389-412. URL: https://www.doi.org/10.1111/anzs.12217.
- Serra, A., P. Coretto, M. Fratello, and R. Tagliaferri (2018). Robust and sparse correlation matrix estimation for the analysis of high-dimensional genomics data. *Bioinformatics*, vol. 34(4): pages 625–634. URL: https://www.doi.org/10.1093/bioinformatics/btx642.
- Coretto, P., A. Serra, and R. Tagliaferri (2018). Robust clustering of noisy high-dimensional gene expression data for patients subtyping. *Bioinformatics*, vol. 34(23): pages 4064-4072. URL: https://www.doi.org/10.1093/bioinformatics/bty502.
- Serra, A., S. Önlü, P. Coretto, and D. Greco (2019). An integrated quantitative structure and mechanism of action-activity relationship model of human serum albumin binding. *Journal of Cheminformatics*, vol. 11(38): pages 1–10. URL: https://www.doi.org/10.1186/s13321-019-0359-2.
- Giordano, F. and P. Coretto (2020). A monte carlo subsampling method for estimating the distribution of signal-to-noise ratio statistics in nonparametric time series regression models. *Statistical Methods & Applications*, vol. 29(3): pages 483–514. URL: https://www.doi.org/10.1007/s10260-019-00487-5.
- Coretto, P. (2020). Discussion (invited) of: Multiple-systems analysis for the quantification of modern slavery: classical and bayesian approaches; by Bernard W. Silverman. *Journal of the Royal Statistical Society, Series A (Statistics in Society)*, vol. 183(3): pages 725–726. URL: https://www.doi.org/10.1111/rssa.12505.
- Coretto, P., M. La Rocca, and G. Storti (2020). Improving many volatility forecasts using cross-sectional volatility clusters. *Journal of Risk and Financial Management*, vol. 13(4): pages 1–23. URL: https://www.doi.org/10.3390/jrfm13040064.
- Storti, G. and P. Coretto (2020). Discussion (invited) of: Linear mixed effects models for non-gaussian continuous repeated measurement data; by O. Asar, D. Bolin, P. J. Diggle and J. wallin. *Journal of the Royal Statistical Society, Series C (Applied Statistics)*, vol. 69(5): page 46. URL: https://doi.org/10.1111/rssc.12405.

- Hennig, C. and P. Coretto (2022). An adequacy approach for deciding the number of clusters for OTRIMLE robust Gaussian mixture-based clustering. Australian & New Zealand Journal of Statistics, vol. 64(2): pages 230–254. URL: https://doi.org/10.1111/anzs.12338.
- Coretto, P. (2022). Estimation and computations for Gaussian mixtures with uniform noise under separation constraints. Statistical Methods & Applications. Journal of the Italian Statistical Society, vol. 31(2): pages 427–458. URL: https://doi.org/10.1007/s10260-021-00578-2.
- Coraggio, L. and P. Coretto (2023). Selecting the number of clusters, clustering models, and algorithms. A unifying approach based on the quadratic discriminant score. *Journal of Multivariate Analysis*, vol. 196: pages Paper No. 105181, 20. URL: https://doi.org/10.1016/j.jmva.2023.105181.

Book editing and papers in books (with peer-review)

- Hennig, C. and P. Coretto (2008). The noise component in model-based cluster analysis. In C. Preisach,
 H. Burkhardt, L. Schmidt-Thieme, and R. Decker, editors, *Data Analysis, Machine Learning and Applications*, pages 127–138. Springer Berlin Heidelberg, Berlin, Heidelberg.
- Coretto, P. and M. L. Parrella (2010). Empirical likelihood based nonparametric testing for capm. In M. Corazza and C. Pizzi, editors, *Mathematical and Statistical Methods for Actuarial Sciences and Finance*, pages 103–112. Springer Milan, Milano.
- Coretto, P., M. La Rocca, and G. Storti (2011). Group structured volatility. In S. Ingrassia, R. Rocci, and M. Vichi, editors, *New Perspectives in Statistical Modeling and Data Analysis*, pages 329–335. Springer, Heidelberg Dordrecht London New York.
- Coppola, G. and P. Coretto (2012). Classificazione del territorio provinciale. In A. VV., editor, Analisi delle caratteristiche strutturali e funzionali delle imprese industriali operanti in provincia di Salerno. Settore Alimentare e Chimico Plastico, pages 43–68. Edizioni Scientifiche Italiane, Napoli.
- Amendola, A., P. Coretto, and G. Storti (2013). Indagine campionaria. In AA.VV., editor, Analisi delle Caratteristiche Strutturali e Funzionali delle Imprese Industriali Operanti in Provincia di Salerno: Settore Costruzioni, pages 39–65. Edizioni Scientifiche Italiane, Napoli.
- Coretto, P., M. La Rocca, and G. Storti (2021). A garch—type model with cross-sectional volatility clusters. In M. Corazza, M. Gilli, C. Perna, C. Pizzi, and M. Sibillo, editors, *Mathematical and Statistical Methods for Actuarial Sciences and Finance*, pages 169–174. Springer International Publishing.
- Coretto, P., G. Giordano, M. La Rocca, M. L. Parrella, and C. Rampichini, editors (2023). Book of Abstracts and Short Papers, 14th Scientific Meeting of the Classiffication and Data Analysis Group. Pearson Education Resources.

Papers in conference proceedings (with peer-review)

- Coretto, P. and C. Hennig (2007). Choice of the improper density in robust improper ML for finite normal mixtures. In *Classification and Data Analysis 2007*, pages 439–442. Springer, Hildeberg.
- Coretto, P. (2008). Robust mixture modelling. In *Joint Meeting of the SFC and CLADAG*, pages 69–72. Edizioni Scientifiche Italiane, Napoli.
- Coretto, P. and C. Hennig (2009). Robust model-based clustering using an improper constant density selected by a distance optimizatin for non-outliers. In *JSM Proceedings, IMS General Theory Section*, pages 3847–3858. American Statistical Association, Alexandria, VA.
- Coretto, P., M. La Rocca, and G. Storti (2009). Group structured volatility. In *Book of Short Papers CLADAG09 Catania*, pages 119–122. CLEUP, Padova.
- Coretto, P. (2012). Adaptive robust location—scale estimation. In S. I. di Statistica, editor, *Proceedings* of the XLVI Scientific Meeting, pages 1–4. Cleup, Roma.

- Coretto, P. and C. Hennig (2014). Robust covariance matrix estimation with regularization. In S. I. di Statistica, editor, *Proceedings of the 47th Scientific Meeting of the Italian Statistical Society*, pages 1–8. Cuec, Cagliari.
- Coretto, P. and C. Hennig (2015). Robust model-based clustering with covariance matrix constraints. In 10^{th} meeting of Classification and Data Analysis Group, pages 1–5. CUEC Editrice, Cagliari.
- Serra, A., P. Coretto, and R. Tagliaferri (2017). On the noisy high-dimensional gene expression data analysis. In A. Petrucci and R. Verde, editors, *Statistics and data science: new challenges, new generations*, pages 919–926. Firenze University Press, Firenze.
- Coretto, P., A. Serra, and R. Tagliaferri (2019). Noise resistant clustering of high-dimensional gene expression data. In *Cladag 2019 Book of Short Papers*, pages 132–135. EUC, Cassino.
- Coraggio, L. and P. Coretto (2019). Likelihood-type methods for comparing clustering solutions. In Cladag 2019 Book of Short Papers, pages 120–123. EUC, Cassino,.
- Coretto, P. and C. Hennig (2021). Non-parametric consistency for the Gaussian mixture maximum likelihood estimator. In *Cladag 2021 Book of short Papers*, pages 116–119. Firenze University Press, Firenze.
- Coretto, P. and L. Coraggio (2021). In-sample and cross-validated likelihood-type criteria for clustering selection. In *Book of Short Papers of the 5th international workshop on Models and Learning for Clustering and Classification*, pages 27–32. Ledizioni, Milano.
- Coraggio, L. and P. Coretto (2023a). Quadratic discriminant scoring for selecting clustering solutions. In Statistical methods for evaluation and quality: techniques, technologies and trends (T3). Book of Short Papers IES 2023, pages 355–360. BACME, Chieti.
- Coraggio, L. and P. Coretto (2023b). Empirical analysis of the quadratic scoring for selecting clustering solutions. In *Book of Abstracts and Short Papers*, 14th Scientific Meeting of the Classiffication and Data Analysis Group, pages 398–401. Pearson Education Resources.